

START 7713541.0506

0046567

90
P

BHI-00725
Rev. 0

100-N Pilot Project: Proposed Consolidated Groundwater Monitoring Program



Prepared for the U.S. Department of Energy
Office of Environmental Restoration and
Waste Management

Bechtel Hanford, Inc.
Richland, Washington

TRADEMARK DISCLAIMER

Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors.

This report has been reproduced from the best available copy.
Available in paper copy and microfiche.

Available to the U.S. Department of Energy
and its contractors from
Office of Scientific and Technical Information
P.O. Box 62
Oak Ridge, TN 37831
(615) 576-8401

Available to the public from the U.S. Department of Commerce
National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
(703) 487-4650

Printed in the United States of America

DISCLM-5.CHP (8-91)

BHI-00725
REV: Rev. 0
OU: 100-NR-2
TSD: N/A
ERA: 100-N SPRINGS

APPROVAL PAGE

Title of Document: 100-N PILOT PROJECT PROPOSED CONSOLIDATED
GROUNDWATER MONITORING PROGRAM

Approval: M. J. Lauterbach, 100-N Area Remedial Action Task Lead



Signature for

11/26/96
Date

B. Mukherjee, 100-N Area Remedial Action Project Engineer



Signature for

11/26/96
Date

The approval signature on this page indicates that this document has been authorized for issue to U.S. Department of Energy, Richland Operations Office through appropriate channels. No other forms or signatures are required to document this information release.

BHI-DIS 12-5-96 *ca*

100-N Pilot Project: Proposed Consolidated Groundwater Monitoring Program

Authors

J. V. Borghese C. J. Perkins
M. J. Hartman J. P. Zoric
S. P. Lutrell S. C. Tindall

Date Published
November 1996



Prepared for the U.S. Department of Energy
Office of Environmental Restoration and
Waste Management

Bechtel Hanford, Inc.
Richland, Washington

CONTENTS

1.0	INTRODUCTION	1-1
2.0	PLANNING WORKSHOP	2-1
2.1	PROBLEM DEFINITION	2-1
2.2	DECISION CRITERIA	2-1
2.3	BOUNDARIES	2-1
2.4	DECISION RULES	2-2
3.0	SYNOPSIS OF EXISTING MONITORING SUBPROGRAMS	3-1
3.1	RCRA GROUNDWATER MONITORING	3-1
3.2	NR-2 GROUNDWATER MONITORING	3-2
3.3	ERA PERFORMANCE MONITORING	3-3
3.4	GROUNDWATER SURVEILLANCE MONITORING	3-3
3.5	NEAR FIELD MONITORING	3-3
3.6	LIQUID EFFLUENT MONITORING	3-4
3.7	NPDES MONITORING	3-4
4.0	EVALUATION PROCESS	4-1
4.1	STREAMLINING THE SUBPROGRAMS	4-1
4.1.1	RCRA	4-2
4.1.2	NR-2	4-4
4.1.3	ERA Performance	4-4
4.1.4	Groundwater Surveillance	4-4
4.1.5	Near Field	4-4
4.1.6	Liquid Effluent	4-4
4.1.7	NPDES	4-5
4.2	DEVELOPMENT OF CONSOLIDATED PROGRAM	4-5
5.0	PROPOSED CONSOLIDATED PROGRAM	5-1
6.0	CONCLUSIONS AND RECOMMENDATIONS	6-1
6.1	CONCLUSIONS	6-1
6.2	RECOMMENDATIONS	6-1
7.0	REFERENCES	7-1

FIGURES

1-1. Location of 100-N Area 1-2
3-1. Well Location Map for N Area Groundwater Programs 3-5
5-1. Location of Wells for Proposed Consolidated Program 5-2

TABLES

3-1. Wells Within the Existing Groundwater Program 3-6
5-1. Wells Within the Proposed Groundwater Program 5-3
5-2. Analytes and Sampling Frequency for the Proposed Consolidated Program 5-4
5-3. Consolidated Program Costs Comparison 5-8

APPENDIXES

Appendix A. Planning Workshop Meeting Minutes A-1
Appendix B. Well Sampling and Analysis Backup Forms B-1
Appendix C. Proposed Consolidated Program: Subprogram Well Location Maps C-1

ACRONYM LIST

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
DOH	Washington State Department of Health
DQO	data quality objectives
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
ERA	expedited response action
ERC	Environmental Restoration Contractor
HEIS	Hanford Environmental Information System
NPDES	National Pollutant Discharge Elimination System
P&T	pump and treat
PNNL	Pacific Northwest National Laboratory
RCRA	Resource Conservation and Recovery Act of 1976
RL	U.S. Department of Energy, Richland Operations
TOC	total organic carbon
TOX	total organic halogens
TSD	treatment/storage and/or disposal
WAC	<i>Washington Administrative Code</i>
WHC	Westinghouse Hanford Company

**THIS PAGE INTENTIONALLY
LEFT BLANK**

1.0 INTRODUCTION

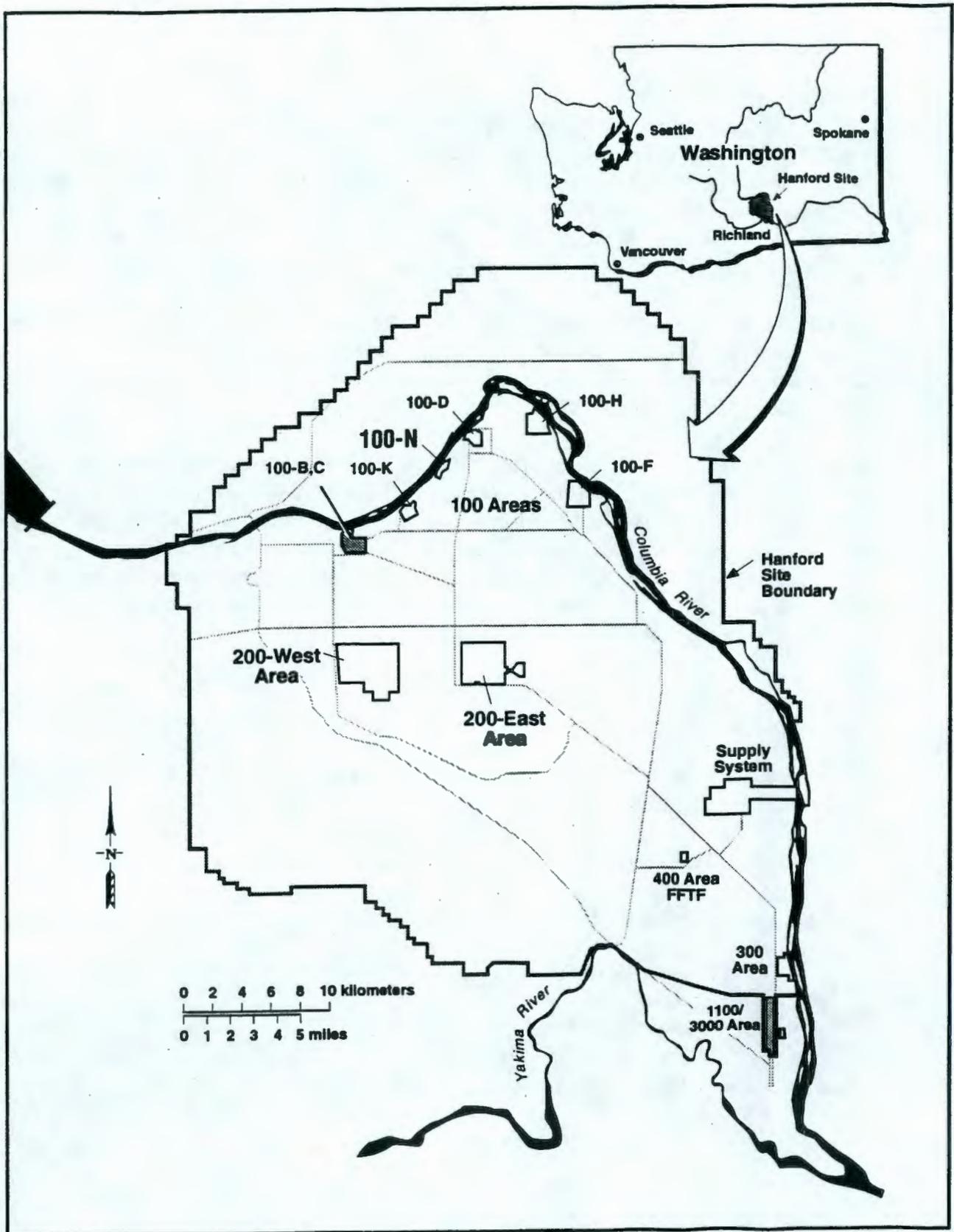
This report presents a proposed consolidated groundwater monitoring program for the 100-N Pilot Project that is the outcome of a cooperative effort between the Hanford contractors who monitor the groundwater beneath the 100-N Area. Members representing the Environmental and Restoration Contractor (ERC), Westinghouse Hanford Company (WHC), and Pacific Northwest National Laboratory (PNNL) participated. The consolidation of the groundwater monitoring programs is being proposed in order to minimize the cost, time, and effort necessary for groundwater monitoring in the 100-N Area and to coordinate regulatory compliance activities. The integrity of the subprograms requirements remained intact during the consolidation effort.

The purpose of this report is to present the proposed consolidated groundwater monitoring program and to summarize the process by which it was determined. This report includes summaries of the planning workshop, existing monitoring programs, and the proposed consolidated program with its implementation steps.

There are seven groundwater monitoring programs, called "subprograms" discussed in this document. These subprograms are in place at the 100-N Area which is located in the northcentral part of the Hanford Site along the southern shoreline of the Columbia River, approximately 43 km north-northwest of the City of Richland, Washington (Figure 1-1). Encompassing 3.5 km² this area is bordered by the Columbia River and the 600 Area (the portion of the Hanford Site that surrounds the primary operation areas). The seven groundwater monitoring subprograms include the following:

- Resource Conservation and Recovery Act of 1976 (RCRA) (1301-N, 1324-N/NA, and 1325-N),
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) 100-NR-2,
- Expedited Response Action (ERA) Performance Monitoring,
- PNNL Groundwater Surveillance, Washington State Department of Health (DOH),
- Liquid Effluent Monitoring,
- Near Field Monitoring, and
- National Pollutant Discharge Elimination System (NPDES).

Figure 1-1. 100-N Area of the Hanford Site.



E9601013.1

2.0 PLANNING WORKSHOP

The planning workshop involved representatives from each of the seven Hanford groundwater monitoring subprograms and from the U.S. Department of Energy, Richland Operations (DOE-RL). (Minutes from the workshop are in Appendix A.) This group discussed the following steps for the development of a consolidated program for seven of the groundwater monitoring programs at the 100-N Area: problem definition, decision criteria, inputs into the decision, boundaries, and decision rules. A qualitative data quality objective process was used. Each step is discussed below.

2.1 PROBLEM DEFINITION

Some of the seven subprograms being considered for consolidation use the same wells, monitor for the same analytes, and sample with the same frequency. In order to reduce the duplication of sampling and analysis, a few of the subprograms have already coordinated sample trips and have shared analytes. Therefore, to further reduce the cost, time, and effort associated with sampling and analysis, the seven subprograms can be formally streamlined and consolidated into one coherent and efficient groundwater monitoring program.

2.2 DECISION CRITERIA

Decisions used to consolidate the subprograms were based on three factors: first to evaluate the validity of the subprogram driver, second to evaluate the sampling points, frequency and analytical constituents, and third, to compile subprogram results into a consolidated program. Because the operation of the facilities has changed, each subprogram's driver was evaluated to determine if the monitoring activity was still necessary to meet the driver's objective. Decision criteria were then used to evaluate each well according to its location, frequency, and analyte list. Next the monitoring subprograms were analyzed in terms of sampling protocol, analytical method, data quality requirements, reporting requirements, costs, and data management. Using these decision criteria, the group decided to first streamline the individual subprograms then develop the consolidated program.

2.3 BOUNDARIES

Seven existing groundwater monitoring subprograms were considered for the consolidation effort and include the area within the 100-NR-2 operable unit.

2.4 DECISION RULES

The decision on whether or not to (1) include a well, (2) include an analyte, and (3) determine sampling frequency as part of the streamlined program was based on one or more of the following criteria: the water column and its flow direction, the well's construction and condition, contaminant trends and distributions, changes in the subprogram driver (i.e. regulatory requirement), and fulfillment of the original monitoring purpose. Each subprogram's monitoring system was evaluated using these criteria.

The N-Spring ERA pump and treat system influences the hydraulics near the 1301-N and 1325-N facilities. The pump and treat began in September 1995. The evaluation of the effects of the pump and treat on the aquifer system is reported in DOE/RL (1996). The pump and treat system has 4 extraction wells and 2 injection wells. The withdrawal of groundwater from the extraction wells forms a hydraulic sink and the injection of treated effluent at the injection wells form a slight groundwater high.

3.0 SYNOPSIS OF EXISTING MONITORING SUBPROGRAMS

The seven 100-N Area groundwater monitoring subprograms considered for consolidation include RCRA, CERCLA 100-NR-2, Performance Monitoring, Surveillance, Near Field, Liquid Effluent, and NPDES. The following paragraphs briefly summarize each subprogram. Appendix B presents the details of current sampling requirements for each subprogram's individual wells, Figure 3-1 shows well locations, and Table 3-1 lists the wells in the existing monitoring subprograms.

3.1 RCRA GROUNDWATER MONITORING

Four RCRA units are located in the 100-N Area: (1) the 1301-N Liquid Waste Disposal Facility (LWDF), (2) the 1324-N Surface Impoundment, (3) the 1324-NA Percolation Pond, and (4) the 1325-N LWDF. The 1324-N and 1324-NA units are monitored as a single site. Interim-status groundwater monitoring began at all of the sites in December 1987.

The 1301-N and 1325-N LWDFs are monitored under indicator evaluation programs as described in the groundwater monitoring plan (Hartman 1993a). The 1324-N/NA site was monitored under a groundwater quality assessment program, as described in the assessment plan (Hartman 1993b, 1995). The site reverted to an evaluation monitoring in early 1996.

The Washington State Department of Ecology (Ecology) has authority for RCRA at Hanford. Interim-status standards are described in the Washington Administrative Code (WAC) 173-303-400 of the *Dangerous Waste Regulations*. The WAC references the standards set forth by the EPA in 40 CFR 265, Subpart F, "Groundwater Monitoring." Requirements for detection monitoring (40 CFR 265.92) include the following:

- Install a monitoring network with at least one upgradient well and at least three downgradient wells capable of detecting any statistically significant amounts of hazardous waste constituents that migrate from the facility to groundwater.
- Develop and implement a sampling and analysis plan describing the groundwater monitoring program.
- Analyze groundwater at given frequencies for contamination indicator parameters, water quality parameters, and drinking water parameters.
- Semiannually compare indicator parameters at upgradient and downgradient wells.

Assessment monitoring (40 CFR 265.93) requires definition of the nature, extent, and rate of movement of contamination.

The 1301-N LWDF is currently monitored by two upgradient wells and seven downgradient wells. The 1325-N LWDF is monitored by one upgradient well and six downgradient wells. The wells for both facilities are sampled semiannually for indicator parameters (pH, conductivity, total organic carbon (TOC), and total organic halogens (TOX), and other constituents (metals, anions, alkalinity, gross alpha, gross beta, and phenols).

The 1324-N/NA site is monitored by one upgradient well and four downgradient wells. The 1324-N/NA site reverted to indicator evaluation monitoring in May 1996, and statistical comparisons were performed on data from the September 1996 sampling event. TOC, TOX, and pH were below comparison values. Specific conductance in downgradient wells was above the comparison value. This was expected because the 1324-NA percolation pond has introduced non-dangerous constituents (e.g. sulfate, sodium) to groundwater. Concentrations of these constituents and specific conductance are continuing previous trends, so no additional groundwater assessment is warranted.

Groundwater samples collected for RCRA are analyzed using SW-846 procedures (EPA 1990). Sampling and analysis and quality control requirements are outlined in a quality assurance plan (WHC 1995a) and WHC procedures (WHC 1995b and 1995c).

In October 1994, the RCRA program conducted a process to streamline monitoring so that the monitoring networks including those at 100-N would (1) be technically sound, (2) meet the requirements of regulations, and (3) be efficient and cost effective. As a result some analytes, that were sampled for information purposes, were dropped from the 100-N RCRA list.

3.2 NR-2 GROUNDWATER MONITORING

The CERCLA 100-NR-2 Groundwater Monitoring subprogram began in September 1992. The purpose of NR-2 monitoring is to determine the nature and extent of contaminants in the groundwater beneath the 100-N Area. The data will be used to help define the remediation activities. The "100-NPL Agreement Change Control Form," Control Number 33, September 23, 1992 between DOE and Ecology established which wells were to be sampled and what constituents were to be monitored.

The 100-NR-2 Groundwater Monitoring subprogram monitors twenty-seven wells distributed throughout the 100-N Area. This is two more than specified in the NPL Agreement. These two additional wells gather information for the delineation of the ⁹⁰Sr plume. The constituents analyzed are selected radionuclides, anions, metals, and field parameters. The wells are sampled semiannually. Analytical data gathered for the 100-NR-2 subprogram is analyzed by an EPA certified laboratory using SW-846 procedures. The samples are collected using ERC procedures (BHI 1995b); the data are stored in HEIS and reported annually (Borghese 1995).

3.3 ERA PERFORMANCE MONITORING

The ERA Performance Monitoring subprogram is designed to determine the effects of the pump and treat on the aquifer system. The subprogram was the outcome of a data quality objectives (DQO) workshop including DOE, Ecology, EPA and ERC. The results of this workshop are summarized in BHI 1995c. Fourteen wells located near the 1301-N and 1325-N facilities are monitored monthly for this subprogram. The samples are collected according to ERC procedures. The constituents analyzed include ^{90}Sr , Ca, Mg, SO_4 , and field parameters. The ^{90}Sr data are determined by an EPA certified laboratory. Field screening methodology is used to analyze other constituents on site. The ^{90}Sr and field parameter data are stored in HEIS; operational data are stored in the N-Springs Project Data Base. The results of this monitoring are submitted to Ecology and EPA monthly. The frequency of groundwater monitoring has been reduced to semiannual on the majority of wells sampled under this subprogram. Changes to this subprogram were agreed to and documented on a TPA change control form M-16-96-04, "Modification of Schedule and Monitoring Network Described in the N-Springs Expedited Response Action Performance Monitoring Plan."

3.4 GROUNDWATER SURVEILLANCE MONITORING

The Groundwater Surveillance subprogram, managed by PNNL, is operated to meet DOE Orders 5400.1, 5400.5, and Atomic Energy Act Section 84. The DOH cosamples some wells and uses data from the surveillance subprogram to help meet their public assurance goals for the Hanford Site. The major tasks of the surveillance monitoring are to characterize, monitor, and document groundwater impacts; to establish a baseline of environmental data; and to evaluate off-site migration. Data from all subprograms are reviewed and used to construct contaminant plume maps. The 1995 annual groundwater monitoring subprogram for the Hanford Site, including the 100-N Area, is identified in Bisping (1996).

The surveillance subprogram monitors 10 wells located throughout the 100-N Area. The samples are analyzed for anions and metals under SW-846 methods at an EPA certified laboratory. Selected radionuclides are also analyzed. Samples are collected according to PNNL procedures (PNL 1993). All data are stored in HEIS and reported annually (Dresel et al. 1995).

3.5 NEAR FIELD MONITORING

The Near Field Monitoring subprogram monitors the N Springs Seeps to satisfy DOE Orders 5820.2A, 5400.1, 5400.5; to assess radiological hazards; and to determine how effective effluent treatment and controls are in reducing effluents and emissions. Wells 199-N-47 and 199-N-48 are monitored under the same orders, and also under DOE Order 5484.1 that states monitoring must be done to assess radioactive contamination and potential exposures to employees and the public. Wells 199-N-47 and 199-N-48 are used to monitor the influence of N-Basin on the

groundwater. These wells are monitored monthly for radionuclides. Samples are taken according to operational guidelines. After analysis at an EPA certified laboratory, the results, which are reported annually (WHC 1995d), are stored in the project files.

3.6 LIQUID EFFLUENT MONITORING

The Liquid Effluent subprogram samples well 199-N-46 to comply with DOE Orders 5400.1 and 5400.5. This well is used to monitor the influence of historic liquid discharges to the 1301-N and 1325-N cribs and trenches. The well is sampled monthly for limited radionuclides (BHI 1995a). Data are stored in project files and reported annually (Dresel et al. 1995).

3.7 NPDES MONITORING

The NPDES permit (WA-000374-3) specifies the sampling of well 199-N-8T. The purpose of this monitoring was to determine the effects of effluent discharge at a compliance point. This discharge, from the N-Reactor complex to the 1301-N and 1325-N facilities, stopped in 1991 and 1993, respectively. However, Well 199-N-8T is still sampled quarterly for oil, grease, iron, ammonium, chromium, and temperature. Constituents are analyzed using SW-846 analytical methods collected and following sampling procedures described in BHI 1995a. Data are stored in project files and reported quarterly.

In July 1995, a request was made by letter to EPA for minor modifications to the NPDES permit that would remove Well 199-N-8T from the permit. This request for removal was based on the fact that the permitted facility, 1301-N Liquid Waste Disposal facility, is no longer in operation.

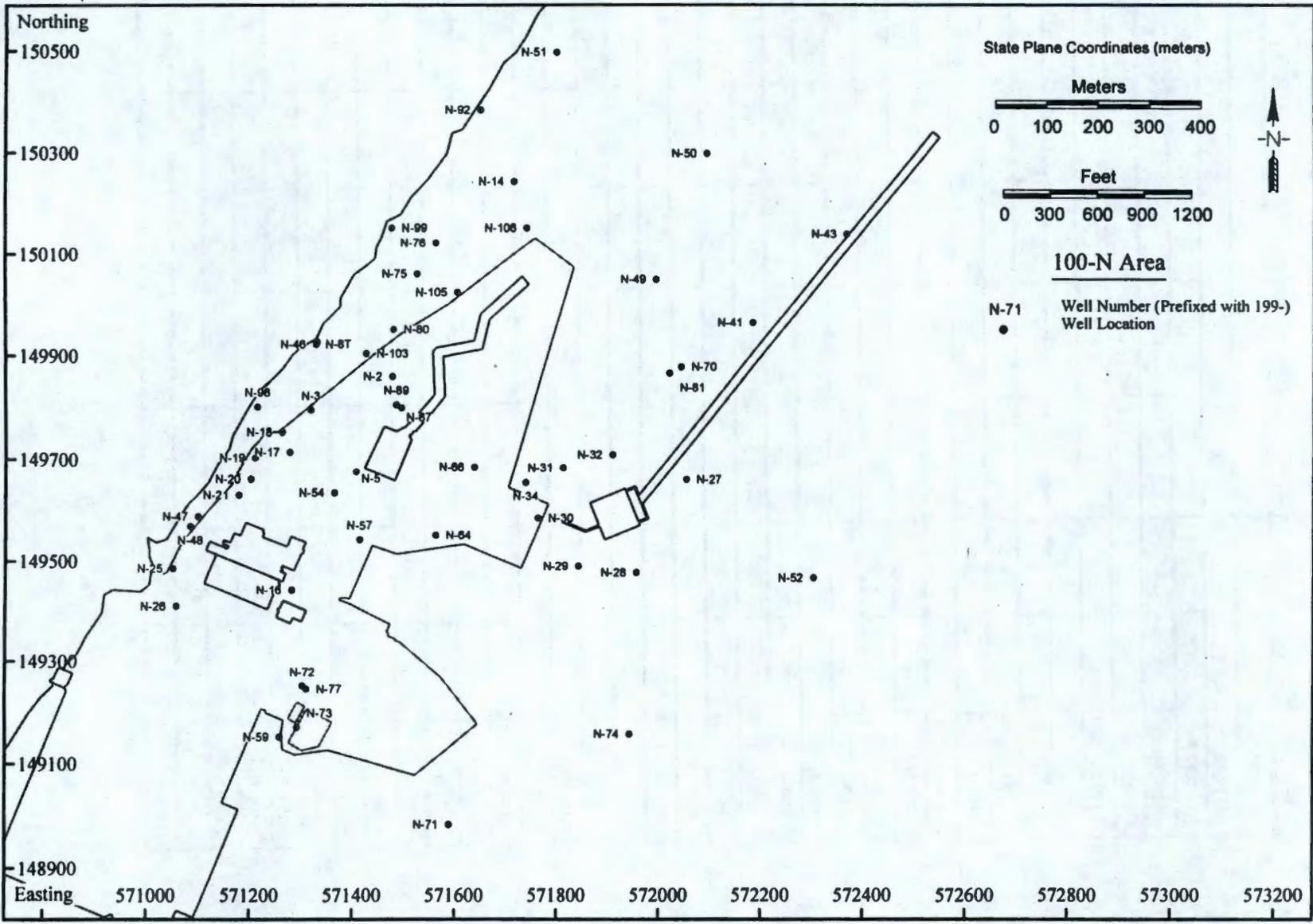


Figure 3-1. Well Location Map for N-Area Groundwater Programs.

Table 3-1. Wells Within the Existing Groundwater Program. (Sheet 1 of 2)

Well No.	RCRA	NR-2	Performance Monitoring	Surveillance	Near Field	Liquid Effluent	NPDES
199-N-2	X		X	X			
199-N-3	X	X	X	X			
199-N-5				X			
199-N-8T							X
199-N-14	X		X	X			
199-N-16		X					
199-N-17		X					
199-N-18		X					
199-N-19		X					
199-N-20		X					
199-N-21		X					
199-N-25		X					
199-N-26		X					
199-N-27	X						
199-N-28				X			
199-N-29		X					
199-N-31			X				
199-N-32	X	X					
199-N-34	X						
199-N-41	X						
199-N-43	X						
199-N-46			X			X	
199-N-47					X		
199-N-48					X		
199-N-49		X					
199-N-50		X					
199-N-51		X					
199-N-52				X			
199-N-54		X					
199-N-57	X						
199-N-59	X						
199-N-64		X					
199-N-66		X					
199-N-67	X	X	X	X			
199-N-69	X			X			
199-N-70	X	X					

Table 3-1. Wells Within the Existing Groundwater Program. (Sheet 2 of 2)

Well No.	RCRA	NR-2	Performance Monitoring	Surveillance	Near Field	Liquid Effluent	NPDES
199-N-71	X	X					
199-N-72	X						
199-N-73	X	X					
199-N-74	X	X					
199-N-75	X	X	X				
199-N-76	X	X	X	X			
199-N-77	X	X					
199-N-80		X		X			
199-N-81	X			X			
199-N-92A			X				
199-N-96A			X				
199-N-99A			X				
199-N-103A			X				
199-N-105A			X				
199-N-106A			X				
Seep Wells					X		

**THIS PAGE INTENTIONALLY
LEFT BLANK**

4.0 EVALUATION PROCESS

The strategy for consolidation of a groundwater monitoring program was developed during the initial sessions of the planning workshop. The program's goal is to meet all the requirements of the specific subprograms in one consolidated effort, thereby reducing costs. The consolidation effort was broken down into two parts: (1) streamlining the subprograms, and (2) developing the consolidated program by combining streamlined subprograms.

4.1 STREAMLINING THE SUBPROGRAMS

Each subprogram was streamlined by analyzing its driver, sampling points, frequency, and analytical constituents. Because the operations of the 100-N Area facilities have changed since many of the monitoring subprograms began, each subprogram's driver was evaluated to determine if the monitoring activity was still necessary to meet the driver's objective. Because the groundwater within the 100-N Area has been characterized, data on the sampling points, frequency and analytical constituents can be used to streamline the subprograms within the limits of their drivers.

The drivers for six of the seven subprograms were determined to be valid. The seventh, the NPDES subprogram driver for the 100-N Area, was considered invalid since effluent discharges ceased at 1301-N in 1985, and there is no longer a need to monitor that facility. Therefore, steps are being taken to remove Well 199-N-8T from the permit. Section 3.7 discusses the NPDES monitoring program.

Each of the six subprograms was streamlined by evaluating each well according to the criteria listed below. See Appendix B for a summary sheet showing a synopsis of the evaluation of these criteria for each well.

- available water column
- flow direction
- well construction
- well condition
- contaminant trends
- contaminant distributions
- monitoring purpose fulfilled
- minimum number of wells to meet requirements
- minimum number of analytes to meet requirements
- lowest frequency of sampling, and
- other criteria of importance.

Use of these criteria permitted the number of wells and analytes monitored, and the frequency of monitoring within each subprogram to be reduced. A brief description of the changes to each subprogram is contained in the following paragraphs.

4.1.1 RCRA

Changes to the RCRA subprogram resulted from 2 considerations: (1) re-evaluation of program with respect to requirements of 40 CFR 265, and (2) accounting for effects of 100-NR-2 pump and treat system. Program re-evaluation resulted in fewer wells, fewer constituents, and reduced sampling frequency for some analytes. The networks for 1301-N and 1325-N had to be further revised to account for changes in water-flow direction and chemistry caused by extraction and injection wells. Details of the changes and justifications are included in Appendix B. They are summarized below.

The 1301-N interim-status indicator evaluation monitoring network will include two upgradient wells (199-N-34 and 199-N-37) and three downgradient wells (199-N-2, 199-N-3, and 199-N-105A). Downgradient wells 199-N-67, 199-N-69, 199-N-75, 199-N-76, and 199-N-14 have been eliminated, and well 199-N-105A has been added. Well 199-N-67 is not required because well 199-N-2 monitors the same portion of the facility. Well 199-N-69 was completed at the bottom of the aquifer. Its original purpose was to define the thickness of the aquifer and the depth of contamination. Its purpose has been fulfilled and dropping it will not reduce network efficiency. The other changes were made to account for the effects of the pumping wells (199-N-75, 199-N-103A, 199-N-105A, and 199-N-106A) on groundwater flow.

Constituent lists and frequency of some analyses have been reduced. Quadruplicate analyses are still required for the indicator parameters pH, conductivity, TOC, and TOX. The streamlined programs still meet the requirements of 40 CFR 265.

The 1325-N interim-status indicator evaluation monitoring network will include one upgradient well (199-N-74), three downgradient wells (199-N-32, 199-N-41, and 199-N-81), and one supplementary well (199-N-28). Wells 199-N-27, 199-N-70, and 199-N-43 were eliminated and well 199-N-28 was added. Well 199-N-27 is no longer downgradient, and well 199-N-70 was completed at the base of the aquifer. During the re-evaluation it was learned that only the first one-quarter of the 1325-N trench was used for waste disposal. Therefore, well 199-N-43 is not required. None of the deleted wells enhances monitoring efficiency. Well 199-N-28 was added as a supplementary well for the purpose of evaluating the impacts of treated groundwater being injected in wells 199-N-29 and 199-N-104A.

Constituent lists and sampling frequencies have been changed in the same way as for the 1301-N wells. Well 199-N-28 will not be used for statistical analyses; therefore, it does not require quadruplicate indicator parameters. The network consists of one upgradient well (199-N-71), three downgradient wells (199-N-59, 199-N-72, and 199-N-73), and a supplementary well (199-N-77).

The 1324-N/NA sites are currently monitored under the detection monitoring program. Well 199-N-77 has been deleted. Well 199-N-59, a downgradient well, contains very little water and can be sampled only when the local water table is high. The 1324-N/NA facility is small, and

can be adequately monitored by the two remaining downgradient wells (199-N-72 and 199-N-73) when 199-N-59 is dry. Well 199-N-77 was completed at the base of the aquifer and will be continue to be monitored, and its original purpose (to better define the uppermost aquifer) has been fulfilled.

Constituent lists and sampling frequencies have been changed in the same way as the 1301-N and 1325-N networks.

4.1.1.1 RCRA Groundwater Monitoring Requirements

This section describes RCRA groundwater monitoring requirements for treatment, storage, and/or disposal (TSD) that undergoes corrective action. The corrective action has the potential for creating perturbations to the existing groundwater monitoring network. The TSD is currently implementing a compliance monitoring program in accordance with Subpart F (40 CFR 265.90-25.94) of RCRA. This act was incorporated by reference in WAC 173-303-400(3)b.

The only way to discontinue groundwater monitoring at a TSD unit (landfill or surface impoundment) is to obtain a waiver from the requirements listed above. This is done by demonstrating that there is a low potential for migration of hazardous waste constituents from the facility in accordance with 40 CFR 265.90(c) or 265.9(d). In lieu of meeting these waiver requirements, compliance monitoring for the TSD unit must continue.

However, 47 FR 32312 states (in summary) that where a compliance monitoring program is established and corrective action is implemented, such a program is sufficient for the corrective action monitoring. In some cases it may be necessary to have more frequent monitoring or a different configuration of wells during a corrective action stage than during compliance monitoring stage. This statement allows compliance monitoring to continue with the use of a modified groundwater network. Sampling and analysis conducted at the modified system must, at a minimum, comply with the list of analytes specified in the approved groundwater monitoring program and contain the minimum amount of groundwater monitoring wells (i.e., one upgradient and three downgradient).

When perturbations, causing a statistical increase in constituents, are identified in the revised monitoring network such results must be communicated to Ecology within seven days. Fifteen days after notification is provided to Ecology, DOE must submit a groundwater quality assessment plan. The assessment plan can provide a firm basis that the perturbations have been caused by the existing pump-and-treat operation, and that no constituents have entered the groundwater from the TSD units and that the current groundwater monitoring plan would not be required to change.

In summary, a modified groundwater monitoring network is allowed for the 1301-N and 1325-N TSD units, provided the above requirements are met, based on the existence of the N-Springs ERA pump and treat system corrective action.

4.1.2 NR-2

The streamlined 100-NR-2 Groundwater subprogram has three fewer wells than the existing subprogram, and the frequency of monitoring has been reduced from semiannually to annually, for most wells, because changes in analytes are minimal over a year. Constituents that have not been detected or are at low levels have been deleted from the analyte lists, resulting in an overall decrease by about a third.

4.1.3 ERA Performance

The groundwater monitoring performed for the ERA began in the fall of 1995 when the pump and treat facility started operating. An evaluation report DOE/RL (1996) discusses the affects of the pump and treat on the aquifer system. With the completion of the evaluation report, groundwater monitoring was reduced. The changes are listed in TPA change control M16-96-04, August 2, 1996, titled "Modification of Schedule and Monitoring Network Described in the N-Springs Expedited Response action Performance Monitoring Plan."

4.1.4 Groundwater Surveillance

The dynamic streamlined Groundwater Surveillance subprogram adjusts the subprogram based on the latest analytical results. Because of reductions in the number of wells in the other subprograms, the Surveillance subprogram increased by 13 wells. Constituents lists are limited to between 2 and four constituents for most wells. The frequency of sampling continues to be annual in all wells except one DOH well which is semiannual.

4.1.5 Near Field

The streamlined Near Field subprogram consists of the same wells and analytes as the existing subprogram. However the frequency of sampling has been reduced from monthly to quarterly.

4.1.6 Liquid Effluent

The streamlined Liquid Effluent subprogram consists of the same well (199-N-46) but has a slightly reduced analyte list. The sampling frequency has changed from a weekly composite to a monthly sampling event.

4.1.7 NPDES

A request has been made to EPA for a modification to the NPDES permit to eliminate the sampling of the 100-N Area well. The subprogram will be eliminated from the consolidated program if the request is approved.

4.2 DEVELOPMENT OF CONSOLIDATED PROGRAM

Once each subprogram was streamlined, they were consolidated. This step of the process required the representatives from each of the subprograms to collectively evaluate the consolidated well list. The evaluation process then continued using the following criteria:

- comparing/analyzing each well with respect to other subprogram requirements, and
- determining if, within a group of wells, one well could meet all subprogram requirements.

In addition to the above criteria, sampling protocols, analysis methods, and data quality requirements needed for the consolidated program were reviewed by other users and were found, for the most part, to be acceptable. The only exception was the procedure for collection of field measurements. Because some field measurements are indicator parameters for the RCRA subprogram, WHC will sample their own wells according to WHC procedures.

Data collected from the consolidated program are to be stored in the Hanford Site Data Base, HEIS, and will be accessible to all participants.

**THIS PAGE INTENTIONALLY
LEFT BLANK**

5.0 PROPOSED CONSOLIDATED PROGRAM

The proposed consolidated groundwater monitoring program for the 100-N Area consists of 41 wells and the N-Spring Seeps. This program was reviewed by the representatives from each of the subprograms and determined to meet the drivers of each subprogram. The consolidated program effectively reduces the overall groundwater sampling and analysis activities for the 100-N Area while meeting the objectives of all subprograms.

The wells for this program are located throughout the 100-N Area. The locations of wells and seeps are shown in Figure 5-1 and listed in Table 5-1. The well coverage for the subprograms is shown on figures contained in Appendix C. The constituents analyzed for each well, the frequency of sampling, and the subprogram requesting the analyses are listed in Table 5-2. The total number of analyses sampled at each well has been reduced significantly. However, to assure that the goal of each subprogram is met, the frequency of sampling for the proposed consolidated program will vary from monthly to annual for selected wells. The timing of annual sampling is important for wells that are influenced by river. The sampling event for these well should be at low river stage so that the sample represents groundwater and not a mixture of groundwater and river water when the sample is taken.

The costs of the proposed consolidated program compared to the costs of the seven existing programs are shown in Table 5-3. Because of the streamlining of subprograms and the shared sampling and analyses costs, there is a potential overall savings of \$248,300. These costs include the following: sampler labor, purge trucks, modutank disposal, shipping, radiation protection, bottle preparation, paperwork preparation, total activity screens, and laboratory analysis. These costs are rough estimates of current and proposed program costs. The costs were estimated by each subprogram. Effort was made to include only the part of subprograms' costs that would apply to the consolidation program. For example, each subprogram has different reporting requirements; therefore, reporting costs were not included in the estimate. A division of the wells and analytes to be sampled by the subprograms was assumed in determining the costs. This division was based on the following criteria:

- Wells sampled only by a specific subprogram belong under that subprogram.
- Wells that have non-standard sampling routines belong under the subprogram that presently performs that sampling, (i.e. pump and treat production wells).
- Wells that have special sampling requirements for a particular subprogram (i.e. sampling for DOH analysis performed by Surveillance; the quadruplicate sampling performed by RCRA).
- Wells that remain are split between the major subprograms.

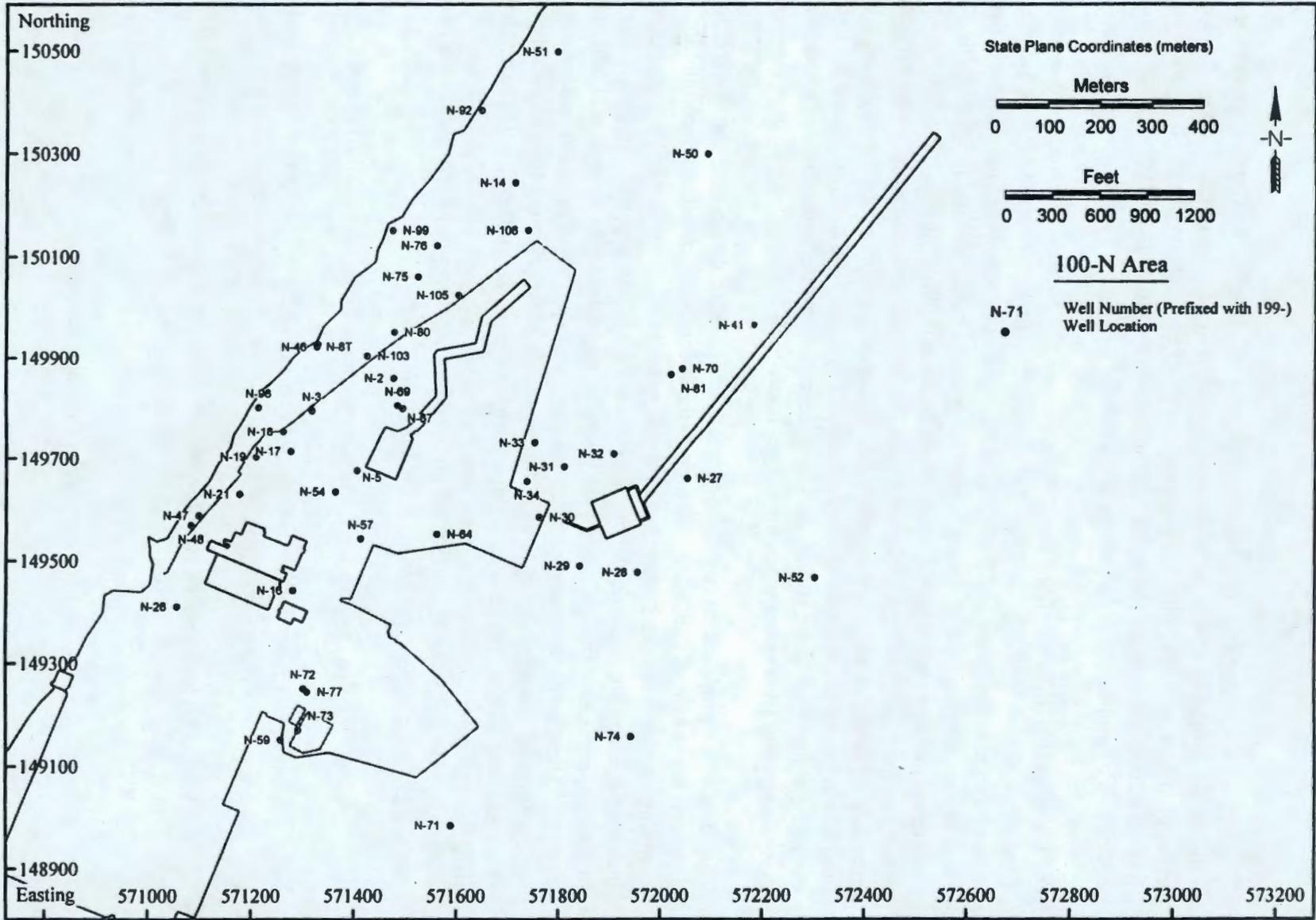


Figure 5-1. Location of Wells for Proposed Consolidation Program.

Table 5-1. Wells Within the Proposed Groundwater Program

Well No.	RCRA	NR-2	Performance Monitoring	Surveillance	Near Field	Liquid Effluent	NPDES
199-N-2	X	X	X				
199-N-3	X	X	X	X			
199-N-5				X			
199-N-8T							X
199-N-14		X	X	X			
199-N-16		X		X			
199-N-17		X					
199-N-18		X		X			
199-N-19				X			
199-N-21		X					
199-N-26				X			
199-N-27		X					
199-N-28	X			X			
199-N-31			X				
199-N-32	X	X					
199-N-33				X			
199-N-34	X			X			
199-N-41	X			X			
199-N-46			X			X	
199-N-47				X	X		
199-N-48					X		
199-N-50		X		X			
199-N-51		X		X			
199-N-52				X			
199-N-54		X					
199-N-57	X			X			
199-N-59	X						
199-N-64		X					
199-N-67		X	X	X			
199-N-69				X			
199-N-70		X					
199-N-71	X			X			
199-N-72	X						
199-N-73	X						
199-N-74	X	X		X			
199-N-75		X	X				
199-N-76		X	X	X			
199-N-77	X						
199-N-80		X		X			
199-N-81	X	X		X			
199-N-92A		X	X				
199-N-96A		X	X				
199-N-99A		X	X				
199-N-103A			X				
199-N-105A	X		X				
199-N-106A			X				
Seep Wells					X		

Table 5-2. Analytes and Sampling Frequency for the Proposed Consolidated Program. (Sheet 1 of 4)

Well No.	Frequency	Conductivity	Eh	pH	Temperature	Turbidity	Alkalinity	Ammonia	Anions	Ca, Mg, SO ₄	ICP-M	ICP-M (F)	Chromium	Iron	Oil/Grease	TPH	TPH	TOC	TOX	Alpha	Beta	Gamma Scan	Gamma Scan (F)	Strontium-90	Strontium-90 (F)	Tritium	Iodine-129	Technetium-99
199-N-2	A	NR		NR	NR	NR	RC		NR			NR							RC	RC		NR		NR		NR		
	S	RC		RC		RC																						
	M	PM	PM	PM	PM					PM														PM				
199-N-3	A						RC		SV			RC								SV	SV				SV			
	S	NR		NR	NR	NR			NR			NR						RC	RC		NR			NR		NR		
	M	PM	PM	PM	PM					PM						PM								PM				
199-N-5	A							SV															SV		SV			
199-N-8T	Q			NP	NP		NP					NP	NP	NP														
199-N-14	A																			SV	SV		SV	SV	SV	SV	SV	SV
	S	NR	PM	PM	NR	NR			NR	PM		NR									NR			NR	PM	NR		
199-N-16	A	NR		NR	NR	NR			NR			NR				NR	NR				NR			NR	SV			
199-N-17	A	NR		NR	NR	NR										NR	NR											
199-N-18	A	NR		NR	NR	NR			SV							NR	NR									SV		
199-N-19	A								SV															SV				
199-N-21	A	NR		NR	NR	NR			NR			NR																
199-N-26	A								SV															SV				
199-N-27	A	NR		NR	NR	NR			NR			NR									NR		NR			NR		
199-N-28	A						RC		RC			RC												SV				
	S	RC		RC		RC													RC	RC								
199-N-31	S	PM	PM	PM	PM																			PM				
199-N-32	S	NR		NR	NR	NR	RC		NR			NR							RC	RC		NR	NR	NR		NR		

Table 5-2. Analytes and Sampling Frequency for the Proposed Consolidated Program. (Sheet 2 of 4)

Well No.	Frequency	Conductivity	Eh	pH	Temperature	Turbidity	Alkalinity	Ammonia	Anions	Ca, Mg, SO4	ICP-M	ICP-M (F)	Chromium	Iron	Oil/Grease	TPH	TOC	TOX	Alpha	Beta	Gamma Scan	Gamma Scan (F)	Strontium-90	Strontium-90 (F)	Tritium	Iodine-129	Technetium-99
199-N-33	A										SV	SV									SV	SV					
199-N-34	A						RC		RC			RC											SV				
199-N-41	A						RC		RC			RC					RC	RC					SV				
	S	RC		RC		RC											RC	RC									
199-N-46	A																		LE	LE	LE						
	M	PM	PM	PM	PM																		LE	PM		LE	
199-N-47	A																						LE	PM			
	Q																					NF					
199-N-48	Q																					NF					
199-N-50	A	NR		NR	NR	NR															NR				NR	SV	
199-N-51	A	NR		NR	NR	NR															NR		SV	SV	NR		
199-N-52	A																						SV		SV		
199-N-54	S	NR		NR	NR	NR			NR			NR		NR	NR						NR	NR	NR				
199-N-57	A						RC		RC			RC											SV				
	S	RC		RC		RC											RC	RC									
199-N-59	A						RC		RC			RC							RC								
	S	RC		RC		RC											RC	RC									
199-N-64	A	NR		NR	NR	NR			NR			NR									NR		NR		NR		
199-N-67	A																						SV	SV	SV		
	S	NR		NR	NR	NR			NR			NR								NR	NR		NR				
	M	PM	PM	PM	PM					PM													PM				
199-N-69	A																					SV		SV			
199-N-70	A	NR		NR	NR	NR			NR			NR									NR	NR	NR	NR		NR	

Table 5-2. Analytes and Sampling Frequency for the
Proposed Consolidated Program. (Sheet 3 of 4)

Well No.	Frequency	Conductivity	Eh	pH	Temperature	Turbidity	Alkalinity	Ammonia	Anions	Ca, Mg, SO ₄	ICP-M	ICP-M (F)	Chromium	Iron	Oil/Grease	TPH	TPH	TOC	TOX	Alpha	Beta	Gamma Scan	Gamma Scan (F)	Strontium-90 (F)	Strontium-90	Tritium	Iodine-129	Technetium-99
199-N-71	A						RC		RC			RC												SV		SV		
	S	RC		RC		RC												RC	RC									
199-N-72	A						RC		RC			RC																
	S	RC		RC		RC												RC	RC									
199-N-73	A						RC		RC			RC																
	S	RC		RC		RC												RC	RC									
199-N-74	A	NR		NR	NR	NR	RC		RC			NR								NR	NR	NR		SV		SV		
	S	RC		RC		RC						RC						RC	RC									
199-N-75	A	NR		NR	NR																			NR		NR		
	S	PM	PM	PM	PM	NR			NR	PM		NR									NR			PM		NR		
199-N-76	A																				SV		SV	SV				
	S	NR		NR	NR	NR			NR			NR										NR	NR	NR		NR		
	M	PM	PM	PM	PM					PM														PM				
199-N-77	A						RC		RC			RC																
	S	RC		RC		RC												RC	RC									
199-N-80	A	NR		NR	NR	NR			NR			NR									NR	NR	NR	NR	SV		NR	SV
	S																											
199-N-81	A	NR		NR	NR	NR	RC		NR	RC		NR	RC								NR			NR	SV		NR	
	S	RC		RC		RC												RC	RC									
199-N-92A	A	NR		NR	NR	NR			NR			NR										NR		NR		NR		
	S	PM	PM	PM	PM																			PM				
199-N-96A	A	NR		NR	NR	NR			NR			NR										NR		NR		NR		
	S	PM	PM	PM	PM												PM							PM				
199-N-99A	A	NR		NR	NR	NR			NR			NR										NR		NR		NR		
	M	PM	PM	PM	PM																			PM				

Table 5-2. Analytes and Sampling Frequency for the Proposed Consolidated Program. (Sheet 4 of 4)

Well No.	Frequency	Conductivity	Eh	pH	Temperature	Turbidity	Alkalinity	Ammonia	Anions	Ca, Mg, SO4	ICP-M	ICP-M (F)	Chromium	Iron	Oil/Grease	TPH	TPH	TOC	TOX	Alpha	Beta	Gamma Scan	Gamma Scan (F)	Strontium-90	Strontium-90 (F)	Tritium	Iodine-129	Technetium-99	
199-N-103A	S	PM	PM	PM	PM					PM																			
199-N-105A	A						RC		RC			RC																	
199-N-106A	S	PM	PM	PM	PM					PM													PM						
Seep Wells	A																							PM					

A = Annually, S = Semi Annually, Q = Quarterly, M = Monthly, F = Filtered
RC = RCRA, NR = NR-2, PM = Performance Monitoring, SV = Surveillance, NF = Near Field, LE = Liquid Effluent, NP = NPDES

Table 5-3. Consolidated Program Costs Comparison.

PROGRAM	ESTIMATED ANNUAL COST FOR EXISTING SUBPROGRAMS	ESTIMATED ANNUAL COST SHARE OF PROPOSED PROGRAM
RCRA	\$ 78,600	49,000
CERCLA	144,000	38,000
Performance Monitoring	352,000	354,500
Surveillance	29,000	18,500
Near Field	13,800	8,500
Liquid Effluent	79,000	-
NPDES	7,400	7,400
TOTAL	\$703,800	\$475,900

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 CONCLUSIONS

The proposed consolidated groundwater monitoring program is the result of the combined efforts of representatives from the 100-N Area groundwater monitoring subprograms and DOE. The proposed program will reduce the overall costs of groundwater monitoring, the time spent in planning and coordinating separate subprograms, and the field effort necessary to perform groundwater monitoring. The results of this effort are summarized below:

- A proposed consolidated monitoring program has been developed that meets the needs of each subprogram.
- This proposed consolidated program reduces substantially, in the following ways, the cost, time, and effort being expended on existing 100-N Area groundwater monitoring:
 - Reducing number of wells by 9
 - Reducing frequency of sampling in 17 wells
 - Reducing number of well trips
 - Reducing program costs by \$248,300.

The proposed consolidated program is more than just a conglomeration of the existing subprogram. It is a result of a collaborative effort by dedicated subprogram representatives to effectively design an efficient groundwater monitoring program.

6.2 RECOMMENDATIONS

The recommendations for the proposed consolidated program follow:

- that Ecology and EPA enter into an NPL Agreement with DOE to implement the proposed consolidated program,
- that subprogram representatives meet periodically to discuss changes to a particular subprogram and how those changes may affect the consolidated program, and
- that the consolidated program be implemented in 1996, so that its benefits are achieved during this fiscal year.

**THIS PAGE INTENTIONALLY
LEFT BLANK**

7.0 REFERENCES

- BHI, 1995a, *Collecting NPDES and Liquid Effluent Samples*, ERWM Desk Instruction No. DI-7BT9001-004, January 3, 1995, Bechtel Hanford, Inc., Richland, Washington.
- BHI, 1995b, *Environmental Investigations Procedures: Groundwater Sampling*, BHI-EE-01, Volume 2, EIP 4.1; Rev 0, Bechtel Hanford Inc., Richland, Washington.
- BHI, 1995c, *N Springs Expedited Response Action Performance Monitoring Plan*, BHI-00164, Rev. 1, Bechtel Hanford Inc., Richland, Washington.
- Bisping, L. E., 1996, *Environmental Surveillance Master Sampling Schedule*, PNNL-10950, Pacific Northwest Laboratory, Richland, Washington.
- Borghese, J.V., 1995, *100-NR-2 Groundwater Summary Report, May 1993 to November 1994*, BHI-00168, Rev. 0, Bechtel Hanford Inc., Richland, Washington.
- Dresel, P.E., P.D. Thorne, S.P. Luttrell, B.M. Gillespie, W.D. Webber, J.K. Merz, J.T. Rieger, M.A. Chamness, S.K. Wurstner, and B.E. Optiz, 1995, *Hanford Site Ground-Water Monitoring for 1994*, PNL-10698, Pacific Northwest Laboratory, Richland, Washington.
- DOE/RL, 1995, *Annual Report for RCRA Groundwater Monitoring Projects at Hanford Site Facilities for 1994*, DOE/RL-94-136, Rev. 0, U.S. Department of Energy, Richland, Washington.
- DOE/RL, 1996, *N-Springs Expedited Response Action Performance Evaluation Report*, DOE/RL-95-110, Rev. 0, U.S. Department of Energy, Richland, Washington.
- Hartman, M.A., 1993a, *Groundwater Monitoring Plan for the 1301-N and 1325-N Facilities*, WHC-SD-EN-AP-038, Rev. 1, Westinghouse Hanford Company, Richland, Washington.
- Hartman, M.A., 1993b, *Groundwater Quality Assessment Plan for the 1324-N/NA Site*, WHC-SD-EN-AP-005, Rev. 1, Westinghouse Hanford Company, Richland, Washington.
- Hartman, M.A., 1995, *RCRA Assessment Report: Total Organic Halogen at the 1324-N/NA Site*, WHC-SD-EN-E-031, Rev. 0, Westinghouse Hanford Company, Richland, Washington, Appendix C.
- PNL, 1993, *Procedures for Ground-Water Investigations*, PNL-6894, Rev. 1, Pacific Northwest Laboratory, Richland, Washington.

WHC, 1995a, *Quality Assurance Project Plan for Groundwater Monitoring Activities Managed by Westinghouse Hanford Company*, WHC-SD-EN-QAPP-001, Rev. 3, Westinghouse Hanford Company, Richland, Washington.

WHC, 1995b, *Environmental Investigations and Site Characterization Manual*, WHC-CM-7-7, Westinghouse Hanford Company, Richland, Washington.

WHC, 1995c, *Environmental Engineering and Geotechnology Procedures*, WHC-CM-7-8, Westinghouse Hanford Company, Richland, Washington.

WHC, 1995d, *Westinghouse Hanford Company Operational Environmental Monitoring Annual Report*, WHC-EP-0573, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

THIS PAGE INTENTIONALLY
LEFT BLANK

APPENDIX A

Planning Workshop Meeting Minutes

**THIS PAGE INTENTIONALLY
LEFT BLANK**

CONTENTS

October 24, 1995	A-1
October 26, 1995	A-4
October 30, 1995	A-5
November 3, 1995	A-6
November 7, 1995	A-8
November 20, 1995	A-12
November 28, 1995	A-14
November 30, 1995	A-17
December 5, 1995	A-18
December 11, 1995	A-20
January 11, 1996	A-22

V
K 8

**THIS PAGE INTENTIONALLY
LEFT BLANK**

MEETING MINUTES

Subject: 100-N Area Groundwater Monitoring Program Consolidation Kickoff Meeting

Date: October 24, 1995

Minutes by: Sebastian Tindall

Attendees: Jane Borghese, ERC
Dave Olson, DOE-RL
Marv Furman, DOE-RL
Ed Shorey, ERC
Merl Lauterbach, ERC
Sebastian Tindall, ERC
Mary Hartman, WHC
Evan Dressel, PNNL
Stuart Luttrell, PNNL
Jackie Schmid, WHC
Bruce Williams, WHC
Joe Zoric, ERC

A meeting on the above subject was held on October 24, 1995 at 2440 Stevens Center, Room 1600. The purpose of the meeting was to discuss ways in which the eight Hanford Groundwater monitoring programs could be consolidated in one unified monitoring program.

AGENDA—GROUNDWATER COORDINATION FOR THE 100 N AREA

Purpose: To identify optimal groundwater monitoring configuration that effectively addresses RCRA groundwater monitoring compliance requirements for 1301-N and 1325-N, CERCLA 100-N ERA requirements, data needs of other groundwater monitoring operating within the impact area of the ERA, and efficiently utilizes data needs of other groundwater monitoring operating within the impact area of the ERA, and efficiently utilizes available resources.

TOPICS FOR DISCUSSION

1. Definition of the problem
2. DOE RCRA-CERCLA Integration Guidance
3. RCRA groundwater monitoring
 - Identification of monitoring wells
 - Compliance and permitting requirements
4. CERCLA groundwater monitoring

- Identification of monitoring wells
 - Data needs
5. Other groundwater monitoring activities
- Identification of monitoring wells and analyte suite
 - Data needs and impacts
6. RCRA/CERCLA conflict
- Pumping impacts on RCRA monitoring wells
 - non-compliance issue: wells that cannot be sampled
 - data representativeness
 - changes in flow direction
 - changes in composition and concentration
 - Optimal mix for RCRA & CERCLA and other groundwater monitoring
 - options identified in WHC position paper
 - identify common data needs
 - identify exclusive data needs
 - assign responsibilities
 - funding arrangements
7. Impacts on other monitoring activities
- Identify impacts
 - Options for resolution
 - Finding arrangements
8. Identify elements for DQO exercise with the regulators
- Schedule "dry run" for DQO exercise with regulators
 - Development elements of DQO exercise

DISCUSSION

1. Representatives of the eight Hanford Groundwater Programs were in attendance:
- RCRA: Mary Hartman, WHC
 - Site-Wide Surveillance, Stuart Luttrell, PNNL
 - Washington Department of Health: Stuart Luttrell, PNNL
 - CERCLA: Jane Borghese, ERC
 - ERA: Jane Borghese, ERC
 - NPDES: Joe Zoric, ERC
 - Operations: Joe Zoric, ERC
 - Liquid Effluent, Joe Zoric, ERC

2. RCRA Groundwater monitoring program objectives:
 - Groundwater monitoring wells to detect any indications of contamination leaching from TSD's
 - Compliance and permitting requirements

3. ERC will begin a Corrective Measures Study (CMS) for 1301/1325 N Cribs (due November 1996, with a TPA Milestone for March 1997) to support closure. The acceptance of the CMS will constitute approval of the closure plan. Three boreholes are now being drilled in the cribs. Ecology wants ERC to leave in-place and cap holes for future use. We have an abundance of groundwater data. Just completed (August/September 1995) a groundwater sampling round (RCRA/CERCLA).

4. PNNL - Sitewide surveillance objective:
 - To get an independent assessment of Hanford groundwater
 - Nature/extent of contamination
 - Observe trends over time so variety of programs at Hanford will have current data

Produce annual Hanford Environmental report for DOE-HQ, which serves as a chapter in DOE-HQ GW report

5. CERCLA Monitoring Project
 - Delineate occurrence and distribution of contaminants
 - Required to do semiannual groundwater sampling & analysis
 - P&T monitoring also in CERCLA program; to be sampled monthly for ⁹⁰Sr
 - Sample P&T process water daily.

6. Program costs (rough estimates) for FY96

CERCLA	\$300K
ERA	\$250K
RCRA	\$200K
SWS/DOH	\$ 20K
<u>Others</u>	<u>\$125K</u>

Total \$895K

7. RCRA/CERCLA Conflict. Review RCRA Corrective Action guidance; when doing a CA (such as a pump and treat, which will perturb the GW system and possibly render the RCRA GW sampling and analysis data useless to meet it's intended purposes) what happens to existing RCRA groundwater monitoring program requirements? Do they cease? Are they suspended? Can they be modified by substituting data from other ongoing programs? Certainly CA P&T would affect data from all or some of the groundwater monitoring wells. We need to look at 40 CFR 264 and 265 and other RCRA requirements. Joe Zoric will check on this.

MEETING MINUTES

Subject: Interview with Marv Furman, DOE-RL

Date: October 26, 1995

Minutes by: Sebastian Tindall

Attendees: Marv Furman, DOE-RL
Sebastian Tindall, ERC

The DQO facilitator, Sebastian Tindall, interviewed Marv Furman, DOE-RL, on October 26, 1995, to ascertain his goals and objectives for this groundwater monitoring program consolidation project.

DISCUSSION

1. **Objectives.** Identify options that will satisfactorily resolve regulatory impasse for the execution of the 100N Area monitoring.
 - CERCLA ERA
 - RCRA groundwater monitoring

2. **Options.**
 - Continue RCRA monitoring groundwater during ERA
 - All RCRA regulations be waived in recognition that if data were collected during the ERA it would not serve the intended purpose
 - RCRA groundwater compliance regulations can be deferred to CERCLA ERA under "parity" principle and be appropriately modified

3. **Schedule.** Next RCRA groundwater monitoring sampling and analysis event is February 1996. Estimated cost will be \$100,000. 100N Pump & Treat will be on-line five-plus months. It will result in questions of the validity and usefulness of RCRA groundwater monitoring data to meet intended regulatory use. There is a need to obtain some resolution from the Regulators. January 10, 1996 is the deadline for the DQO workshop to complete the consolidation process.

MEETING MINUTES

Subject: Meeting with Jane Borghese and Sebastian Tindall

Date: October 30, 1995

Minutes by: Sebastian Tindall

Attendees: Jane Borghese, ERC
Sebastian Tindall, ERC

Jane Borghese, Project Task Lead and Sebastian Tindall, DQO Workshop facilitator, met on October 30, 1995, to discuss the project objectives and develop the schedule.

ACTIONS

1. Jane Borghese to call Maureen Ridley/Cary Tuchfield of Lawrence Livermore National Laboratory (LLNL) to obtain a detailed task list for what they propose to do for us including LOE estimates and schedule. Examples are:
 - Reduction of analytes and frequency of analysis at LLNL
 - Well reduction strategy via kriging at Savannah River
2. Jane Borghese to get feedback from Dorothy Bishop, LLNL Manager on Procurement issues. Sebastian Tindall to check with Dave Olson/Jeff Day/Linda McClain on DOE/RL to DOE Oakland vs ERC subcontract.
3. Jane Borghese to contact the Eight Hanford GW program representatives to identify the need to define their Program requirements.
4. Sebastian Tindall to interview program representatives concerning background, experience, and goals.
5. Jane Borghese to read the LLNL paper on their GW Monitoring program reduction strategy and to make copies for Dave Olson and the Program representatives.
6. Jane Borghese/Sebastian Tindall to develop the project schedule and reserve rooms. Times should be 1:00-4:00 PM, and location should be in trailers (3050A, B, C).
 - This week? Thurs PM? Fri?
 - Next Mon.? Tue?
 - Nov. 20
 - Nov. 28 & 30
 - Dec. 5 & 7

MEETING MINUTES

Subject: Strategy for Planning Workshop

Date: November 3, 1995

Minutes by: Sebastian Tindall

Attendees: Jane Borghese, ERC
Ed Shorey, ERC
Sebastian Tindall, ERC
Dave Olson, DOE-RL
Marv Furman, DOE-RL

The facilitator met with the ERC and DOE-RL Project staff to discuss the consolidation project plan objectives and strategy.

DISCUSSION

1. The objective of the workshop is to devise a 100-NR-1&2 Groundwater Monitoring Program through consolidation of the eight existing programs that will meet all the requirements of the eight existing programs:
 - RCRA
 - CERCLA 100-NR-2
 - CERCLA ERA
 - NPDES
 - Liquid Effluent
 - Operations (Near Field Monitoring)
 - Sitewide Surveillance
 - DOH

2. Strategy was discussed for analyzing each program well by well. The strategy was to:
 - Identify each well currently used for each program
 - Identify the frequency of sampling/analysis for each well for each program
 - Identify the analyte list for each well for each program
 - Systematically analyze each of the above with the program requirements in mind to obtain:
 - the minimum number of wells to be used
 - the minimum number of analytes
 - the lowest frequency for sampling/analysis

3. The proposed strategy for the planning workshop is to discuss the following for each of the eight Hanford GW programs:
- What is the purpose of each well
 - Is it really needed?
 - Eliminate redundant/unnecessary groundwater wells

Once each program is reviewed, then combine the eight Hanford GW program into one. With the combined program compare/analyze each well with respect to other Hanford GW program requirements.

4. Discuss 11/7/95 Planning workshop meeting agenda and actions for that meeting:
- Ask each Hanford GW program representative to bring in statements of their program driver(s)
 - Discuss each program and brainstorm criteria for evaluation
 - Inform Hanford GW program representatives of strategy for consolidating program
 - Brainstorm criteria for consolidating program
 - What are the common needs and the exclusive needs of the Hanford GW programs? What are the resources available to meet these common needs?
 - ERA effects: can each program live with the discontinuity of data?

MEETING MINUTES

Subject: Groundwater Monitoring Program Consolidation Planning Workshop

Date: November 7, 1995

Minutes by: Sebastian Tindall

Attendees: Jane Borghese, ERC
Ed Shorey, ERC
Marv Furman, DOE-RL
Dave Olson, DOE-RL
Mary Hartman, WHC
Stuart Luttrell, PNNL
Craig Perkins, WHC
Joe Zoric, ERC
Sebastian Tindall, ERC - Facilitator

AGENDA

1. Discuss and clarify objectives of the consolidated groundwater monitoring program (lead: Jane Borghese)

Proposed objective:

Develop a groundwater monitoring program that will meet all requirements of the eight specific "subprograms", in order to reduce overall costs.

2. Discuss proposed strategy:
 - A. Each subprogram will be described by identifying:
 - Each will within that subprogram
 - Analytes required for each well
 - Required frequency of sampling each well
 - Sampling protocols
 - Analysis methods
 - Data quality requirements
 - B. Systematically analyze results from above within each subprogram requirements in mind to obtain:
 - Minimum numbers of wells needed to meet subprogram requirements
 - Minimum number of analytes needed to meet subprogram requirements

Criteria to use in this systematic evaluation include:

- What is the purpose of each well?
 - What was the original purpose of each well?
 - Have the requirements changed?
 - Is each well still needed?
 - Which, if any, wells can be eliminated from that program and still meet requirements?
- C. Combine the results of 8 subprograms into one comprehensive program
- Compare/analyses each well with respect to other subprogram requirements
 - Can a well meet one or more subprogram requirements?
- D. DQO Team needs to develop evaluation criteria for Items B and C above
- E. Other Issues?
- F. Assignments of action items for next meeting, November 20, 1995

DISCUSSION

1. Discussed/clarified objectives of the consolidated GW monitoring program (See Attachment I).
2. Discussed proposed strategy
 - Jane Borghese passed out maps of the monitoring well systems for each of the eight Hanford GW programs
 - Team members will do following items as homework before 11/20/95 meeting
 - describe subprogram (Item A on agenda)
 - analyze subprogram (Item B on agenda)
 - At 11/20/95 meeting, team will consolidate program (Item C on agenda)
 - Potential problems identified with the use of the various labor unions involved in collecting samples, specifically jurisdiction
 - Add the following categories to Item A:
 - g. reporting
 - h. costs
 - i. data management
 - Cost elements to consider:
 - Planning
 - Sampling
 - purge trucks
 - modutank disposal
 - shipping
 - RAD protection
 - sample preparation
 - decontamination
 - Total activity screens

- Labor
- Analysis
- Reporting
- Data Management
- Shipping
- Data validation

ACTIONS

1. Sebastian Tindall to resend the cmail message with the meeting dates/locations in WP 5.1
2. Subprogram representatives
 - Do Item A
 - Do Item B
 - Make a list of criteria for Item C due to Sebastian Tindall by 11/14/95 via cmail in electronic format (WP 5.1)
3. Subprogram representatives to submit the subprogram regulatory drivers with references to Sebastian Tindall by 11/14/95 in electronic format (WP 5.1)
4. Meeting notes to team by Sebastian Tindall by 11/9/95
5. Ed Shorey will have Mike Connelly make maps for each of the eight subprograms showing that subprogram's wells

Attachment 1

100-N Area Groundwater Program Consolidation

Groundwater programs within the 100 N Area

Groundwater within the 100 N Area is monitored under 8 different programs. These programs are: CERCLA NR-2, CERCLA ERA, RCRA (1301N, 1325N, 1324N, 1324N/NA), Sitewide Surveillance, DOH, Near Field Monitoring, NPDES, and Liquid Effluent. These programs have differing regulatory drivers and possible difference in sampling and analysis techniques.

Objective

The objective of the consolidation effort is to provide one groundwater monitoring program for all users. This program would be responsible for the collection of GW samples, analysis and data handling in a way that satisfies the requirements of the subprograms.

Approach

The approach to meet the objective of a consolidated program is to identify for each program:

- The wells currently used
- The frequency of sampling
- The analytes
- Sampling protocols
- Methods of analysis
- Data quality requirements.

Then systematically analyze the above, with regulatory controls in mind, to obtain the minimum:

- Number of wells
- Number of analytes
- Lowest frequency of sampling and analysis to satisfy the objectives of all programs.

A DQO workshop will be done to provide guidance on the systematic approach to reducing components of a subprogram for inclusion to the N-Area consolidated groundwater program.

Issues

It has been identified that the 1301N and 1325N RCRA program may need adjusting because of the effects of the N-Springs ERA pump and treat. Since it has not been determined when a program change may occur, the consolidation effort should use the current RCRA program and ignore potential influences of the pump and treat system. Once a consolidated program has been proposed, then this proposed network can then be critically looked at in meeting program objectives with the influences of the pump and treat.

MEETING MINUTES

Subject: 100 NR Groundwater Consolidation DQO Workshop

Date: November 20, 1995

Minutes by: Sebastian Tindall

Attendees: Jane Borghese, ERC
Ed Shorey, ERC
Marv Furman, DOE-RL
Dave Olson, DOE-RL
Mary Hartman, WHC
Stuart Luttrell, PNNL
Craig Perkins, WHC
Joe Zoric, ERC
Sebastian Tindall, ERC - Facilitator

DISCUSSION

1. Reviewed "homework" with group.
 - Files were delivered to Sebastian Tindall in variety of formats.
 - Sorted through each as a group to assess if "homework" requirements were fulfilled by each program:
 - Stuart Luttrell, Surveillance and DOH
 - Mary Hartman, RCRA
 - Joe Zoric, NPDES and Liquid Effluent
 - Craig Perkins, Near Field
 - Jane Borghese, CERCLA and ERA
2. Jane Borghese and Sebastian Tindall will assemble "homework" inputs into workable tables/format and send to team by 11/22/95 for review. Team will meet 11/28/95 to discuss input.
3. Held preliminary discussion on developing Criteria for consolidated programs.
 - Well construction data/requirements
 - Wells which satisfy most subprogram requirements
 - Weighing factors; some subprogram wells may be more important
 - Flexibility (Will complete this element on 11/28/95 meeting after group reviews "homework" inputs).
 - Which well locations meet the most requirements?

- Then, of those locations, which analytes meet most requirements?
 - Then, of those location/analytes which frequency meets the most requirements?
4. Discussed results of analyzing each subprogram.
 - RCRA - Mary Hartman
 - Surveillance & DOH - Stuart Luttrell
 - NPDES - Joe Zoric
 6. Discussed "costs".
 - Wide-variety of costs found from comparing the subprograms cost info.
 7. Discussed endpoint of these exercises?
 - Ed Shorey wants a map with locations and identification of wells which meet combined site and subprogram GW monitoring requirements; in other words, a graphical display of the wells to be included in the consolidated GW monitoring program.

ACTIONS

1. Jane Borghese/Sebastian Tindall to compile and format the "homework" info and deliver to the group by 11/22.
2. Group to review the compiled "homework" info by 11/28.
3. Group to develop criteria "C" (see 11/7/95 Agenda) by 11/28.
4. Jane Borghese to prepare maps showing redundancies by 11/28.
5. Mary Hartman to compile inventory combining RCRA program by 11/28.
6. Stuart Luttrell to update list of wells for PNNL surveillance monitoring by 11/21.
7. Joe Zoric to give Jane Borghese info on well N-46 by 11/27.

MEETING MINUTES

Subject: 100 N Groundwater Consolidation DQO Workshop

Date: November 28, 1995

Minutes by: Sebastian Tindall

Attendees: Jane Borghese, ERC
Ed Shorey, ERC
Marv Furman, DOE-RL
Dave Olson, DOE-RL
Mary Hartman, WHC
Stuart Luttrell, PNNL
Craig Perkins, WHC
Joe Zoric, ERC
Sebastian Tindall, ERC - Facilitator

AGENDA

1. Overview of each subprogram presented by representative.
 - NR-2
 - ERA Performance Monitoring
 - RCRA
 - Surveillance
 - NPDES
 - Near Field Monitoring
 - Liquid Effluent
2. Synopsis of Summarized Tables
 - Drivers
 - Program description
 - Consolidation
 - Maps
3. Develop Part C (from 11/7/95 agenda) criteria for combining/eliminating individual programs groundwater monitoring wells into one comprehensive unified groundwater monitoring program.

DISCUSSION

1. **Passed out lists**
 - Jane Borghese provided revised compilation of subprogram analysis for CERCLA and ERA
 - Joe Zoric provided revised Part A & B (see 11/7/95 agenda) for NPDES
2. **Wall maps**
 - Shows locations of all wells
 - Identifies program for each well
3. **Overview of each Program:**
 - **CERCLA - Jane Borghese**
 - 100-NR-2 streamlined groundwater SAP (BHI-0065, Rev. 00), January 95, shows ERC plan for streamlining groundwater monitoring
 - The plan was presented to EPA/Ecology; they wanted streamlining of all 8 programs and not just CERCLA program from NR-2
 - This SAP was not implemented; it represents a severe cut-back from current groundwater monitoring programs at NR-2.
 - The proposed SAP is still valid with only minor changes needed.
 - **ERA - Jane Borghese**
 - Refer to N-Springs ERA Performance Monitoring Plan, Table 1
 - Plan came out of N-Springs DQO process with EPA/Ecology giving approval. Will have to get regulator approval for any changes.
 - **RCRA - Mary Hartman**
 - Basic RCRA objective is "to see if TSD leaks".
 - **Sitewide Surveillance - Stuart Luttrell**
 - Includes DOH program
 - Atomic Energy Act and WA code (DOH) establish baseline for WA groundwater quality.
 - **NPDES - Joe Zoric**
 - N-8T data was used for 2 programs before 1991 (NPDES & Effluent Monitoring), now only used for NPDES
 - N-46 now used for Liquid Effluent monitoring. It has highest Sr-90 hits. It was questioned why Pu was on the list. There is little likelihood that Pu could migrate to this well location.

- Near Field - Craig Perkins
 - Craig identified that the 13 seep wells do not monitor groundwater. He considers them to monitor surface water. It is very difficult to sample seep wells depending on river level. When river is high, seep wells really sample river water. When river is low, seep wells sample groundwater.
 - N-47 & 48 wells monitor only for gamma scan to check on leaks from reactor facility.
4. Agenda Item 2
- Jane Borghese went through her consolidated program tables with group to obtain comments for revisions.
 - Drivers were addressed earlier in meeting by each program representative during overview.
 - Program description done earlier in meeting by each program representative during overview.
 - Several options for presentation to group were discussed. Ed Shorey/Jane Borghese will contact Mike Connelly to get maps prepared.
5. Criteria for consolidation:
- Group examined well list for all programs (J Borghese handout)
 - Well locations that meet most requirements
 - Of those wells, select which analytes meet most requirements
 - Of those wells and analytes, select which frequency meets most requirements

ACTIONS

1. Stuart Luttrell will check on Uranium as an analyte.
2. Mary Hartman will send Jane Borghese comments on Part B (see 11/7/95 Agenda) table.
3. Jane Borghese will have maps prepared and will update tables.
4. Joe Zoric will check on how/why Plutonium isotopes got on analyte list for Liquid Effluent program.

MEETING MINUTES

Subject: 100 NR Groundwater Consolidation Planning Workshop

Date: November 30, 1995

Minutes by: Sebastian Tindall

Attendees: Jane Borghese, ERC
Mary Hartman, WHC
Stuart Luttrell, PNNL
Joe Zoric, ERC
Sebastian Tindall, ERC - Facilitator

DISCUSSION

1. This was a working session where representatives of the Hanford GW monitoring programs met to collectively examine all of the monitoring wells in each program and attempt to consolidate wells into a streamlined monitoring program fitting the requirements of all the programs.
2. Handout from Jane Borghese
 - Draft well reduction
 - Discussed revisions to list (keepers vs deletions) and candidate wells
 - Mary Hartman will need more time to evaluate this list. She will have evaluation by next meeting (12/5/95). She does not anticipate major changes, e.g. may be only one well.
3. Group needs to prepare documentation on all wells deleted with reasons why. Same for wells kept and why. Sebastian Tindall will devise a well documentation form for each subprogram to compile this information. Jane Borghese will send form to team members.

ACTIONS

1. Jane Borghese will revise the well list and send to the team members via cmail in electronic format for review.
2. Mary Hartman will review the list discussed today and send her comments to Jane Borghese.

MEETING MINUTES

Subject: 100 NR Groundwater Consolidation Planning Workshop

Date: December 5, 1995

Minutes by: Sebastian Tindall

Attendees: Jane Borghese, ERC
Mary Hartman, WHC
Craig Perkins, WHC
Evan Dressel, PNNL
Sebastian Tindall, ERC - Facilitator

DISCUSSION

1. All representatives submitted well documentation forms for each well in their program. Jane Borghese compiled this information and revised the "Well list for streamlined programs".
 - Jane Borghese produced revised maps based on this list.
 - The group reviewed this revised list for accuracy and reached agreement.
 - Results of this working group to develop a consolidated GW monitoring plan will be presented at next meeting to DOE-RL.

2. Discussed unifying the sampling frequencies and analyte classes. This can be done by:
 - Computer: Check with LLNL for their Fortran routine
 - Manual: Use Sample Planners from each subprogram
 - Debbie Day, WHC
 - Paula Henry, PNNL
 - David St John, ERC

3. Discussed subprogram description, Part A (from 11/7/95 Agenda).
 - Sampling protocols
 - Media (groundwater) is same for all
 - Sampling protocols are virtually identical
 - Report will state all program Sampling protocols are functionally equivalent and any sampling protocol can be used by sampling teams.
 - Copies of each subprogram's sampling protocols will be reviewed by each team member to attest each are functionally equivalent.

- Analytical methods
 - Sebastian Tindall/Jane Borghese will design form listing all parameters.
 - Subprogram representatives will identify analytical methods for each parameter on form and submit to Jane who will compile the information and present to team for review.
 - Data Quality requirements
 - Reporting requirements
 - Costs
 - Data Management requirements
4. Fruitful discussions took place on these four final elements of Part A. However, no actions resulted. Discussion will help in presentation of tentative consolidated plan to DOE at the 12/7/95 meeting.
5. Each subprogram representative needs to consider what steps and time will be needed for their programs to review and approve the consolidated program.

MEETING MINUTES

Subject: 100 NR Groundwater Monitoring Workshop

Date: December 11, 1995

Minutes by: Sebastian Tindall

Attendees: Jane Borghese, ERC
Dave Olson, DOE-RL
Marv Furman, DOE-RL
Ed Shorey, ERC
Merl Lauterbach, ERC
Sebastian Tindall, ERC
Mary Hartman, WHC
Stuart Luttrell, PNNL
Craig Perkins, WHC
Berry Vedder, ERC
Joe Zoric, ERC
Basu Mukherjee, ERC

DISCUSSION

1. Barry Vedder presented a briefing on RCRA monitoring as affected by remedial action:
 - Monitoring program is setup for remedial action.
 - EPA guidelines:
 - must be as effected under remedial action as before
 - expanded monitoring under remedial action to test how effective remedial action will be

Usually current locations/frequency will suffice; sometimes have to install more monitoring wells or use higher frequency. RCRA has flexibility to define what detection system looks like.

Mary Hartman said there is no compliance monitoring because sites are in detection monitoring. Will not meet monitoring requirements once pump and treat starts. Regulation may require additional wells from our consolidated scheme. The plan should show what we propose to do to continue to meet the monitoring requirements/objectives.

Ed Shorey suggested that RCRA keep the monitoring program as it is in the consolidated program, but suspend the statistical comparisons during remedial action. Mary Hartman will consider this strategy.

2. Jane Borghese presented

- New consolidated program well map
- Original program well map
- Well list - Keepers by program
- Well list - Frequency by program

The group reviewed the new well list and made the following changes:

- Eliminate wells N-21 and N-29
- Identified wells N-43, N-48, N-59 as candidates for deletion

3. Additional items discussed:

- Group will review each others sampling procedures
- Group will review each others analytical procedures
- Group will review each others data qualification requirements
- Reporting requirements will not change
- Group will supply original/revised program costs to Jane Borghese
- Data management will not change

ACTION

1. Group will review well table and notify Jane Borghese via cc:Mail with results.
2. Mary Hartman, Stuart Luttrell, and Craig Perkins to review candidate wells for deletion. Notify Jane Borghese via cc:Mail with results.
3. Jane Borghese to revise maps.
4. Jane Borghese to make up new cost list to group. Define elements.
5. Group to get old/new cost information to Jane Borghese.
6. Jane Borghese to take first cut at dividing wells/analytes for implementation.

MEETING MINUTES

Subject: 100 NR Groundwater Consolidation Planning Workshop

Date: January 11, 1996

Minutes by: Sebastian Tindall

Attendees: Jane Borghese, ERC
Ed Shorey, ERC
Marv Furman, DOE-RL
Dave Olson, DOE-RL
Mary Hartman, WHC
Stuart Luttrell, PNNL
Craig Perkins, WHC
Tony Knepp, ERC
Steve Trent, ERC
Joe Zoric, ERC
Sebastian Tindall, ERC - Facilitator

DISCUSSION

1. Discussions began on identifying the regulatory agency personnel responsible for each of the Hanford GW monitoring programs for the purposes of inviting them to a briefing on the consolidation plan.
 - Near Field: Dana Ward and/or John Cook from DOE-RL
 - RCRA: Stan Leja and Phil Staats, Ecology
 - NPDES: Mr Ragsdale, EPA
 - Liquid Effluent: Dana Ward and/or John Cook from DOE-RL
 - Surveillance/DOH: Lynn Albin, DOH
 - CERCLA: Phil Staats, Ecology
 - ERA: Phil Staats, Ecology and Pam Innis, EPA

Dave Olson will contact Phil Staats, Ecology, and invite him to a briefing and ask him to bring any other appropriate Ecology staff. Pam Innis of EPA will also be invited by Dave Olson. The remainder of the above would be briefed by the subprogram representative or DOE-RL staff as needed.

2. Discussed the actions needed for presenting the report and the briefing:
 - Submit report to DOE by 1/24/96
 - Overview briefing to regulators scheduled for 1/24/96. Jane Borghese will prepare the briefing and graphics.
 - DOE to provide report to regulators on or shortly after 1/24/96

- At a later date, convene a workshop with Team members, ERC technical support staff, and regulators to:
 - discuss regulators questions and/or concern on plan
 - discuss plan implementation and regulator approval process
- 3. Need BHI Regulatory Compliance group opinion on ERA effects on RCRA GW monitoring program. Sebastian Tindall will request write-up from Regulatory Compliance.
- 4. Jane Borghese will put the Performance Monitoring wells back into plan maps.
- 5. Options for how to accommodate the ERA pump and treat into the RCRA program were discussed.
 - If the RCRA program was suspended, all but 3 RCRA wells would still undergo sampling & analysis under the other subprograms.

Options presented were:

- While the ERA P&T is on, RCRA monitoring could be suspended due to "parity". May require a waiver which may be difficult and time-consuming to obtain.
- Continue RCRA but modify the program by deleting wells perturbed by the pump and treat and adding new up/down gradient wells.

Dave Olson and Marv Furman agreed that the second option would be pursued. The intent is to be protective of human health and the environment and not to evade monitoring.

Jane Borghese will write this up in the report and in the presentation graphics for the 1/24/96 briefing. Mary Hartman will provide program changes to Jane by 1/15/96.

- 5. Implementing the consolidated program
 - Which subprogram will do the sampling and analysis for each well?
 - Whoever does it must assume analyte and frequency requirements of other subprograms
 - Will establish a future meeting to discuss this and related issues (QA/QC requirements, sampling protocols, data management and reporting requirements)
- 6. Dave Olson would like the report to show expected cost savings.
- 7. Tony Knepp reminded the team of the necessity for BHI internal reviews by Regulatory Compliance, legal, and Environmental Technologies functional groups.

ACTIONS

1. Jane Borghese and Mary Hartman will confer on the RCRA modifications. Stuart Luttrell will review the revisions.
2. Jane Borghese will complete the draft report and deliver it for internal review by 1/15/96. Comments are due back to Jane by 1/18/96.
3. Dave Olson will call Phil Staats to invite him and Stan Leja (and other Ecology staff) to the 1/24/96 briefing. Dave will schedule the 1/24/96 briefing.
4. Stuart Luttrell will invite Lynn Albin to the 1/24/96 briefing.
5. Jane Borghese will prepare the 1/24/96 briefing.
6. Sebastian Tindall will contact Roger Landon and Barry Vedder and request written input with citations regarding how ERA pump and treat affect RCRA GW programs.
7. Sebastian Tindall will also notify BHI Environmental technology department that functional reviews are needed within the schedule constraints.

APPENDIX B

Well Sampling and Analysis Backup Forms

THIS PAGE INTENTIONALLY
LEFT BLANK

**THIS PAGE INTENTIONALLY
LEFT BLANK**

199-N-2	B-1
199-N-3	B-5
199-N-5	B-9
199-N-8T	B-10
199-N-14	B-11
199-N-14	B-12
199-N-16	B-15
199-N-17	B-17
199-N-18	B-18
199-N-19	B-20
199-N-20	B-22
199-N-21	B-23
199-N-25	B-24
199-N-26	B-25
199-N-27	B-27
199-N-27	B-28
199-N-28	B-29
199-N-29	B-31
199-N-32	B-33
199-N-33	B-35
199-N-34	B-36
199-N-41	B-38
199-N-43	B-40
199-N-46	B-41
199-N-47	B-43
199-N-48	B-45
199-N-49	B-46
199-N-50	B-47
199-N-51	B-49
199-N-52	B-51
199-N-54	B-52
199-N-57	B-53
199-N-59	B-55
199-N-64	B-56
199-N-66	B-57
199-N-67	B-58
199-N-69	B-62
199-N-70	B-64
199-N-71	B-66
199-N-72	B-69
199-N-73	B-70
199-N-74	B-72
199-N-75	B-75
199-N-76	B-78
199-N-77	B-82

199-N-80	B-84
199-N-81	B-86
199-N-92A	B-89
199-N-96A	B-91
199-N-99A	B-93
199-N-103A	B-95
199-N-105A	B-96
199-N-106A	B-98

Well #: 199-N-2
Program: RCRA 1301

Responsible Contractor: WHC
Contact: Mary Hartman
Phone: 376-9924

Monitoring Program Driver:
 40 CFR 265, Subpart F

Purpose for Monitoring Well:

Original: Downgradient compliance

Current: Same

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

Contaminant Trends

See comments

Comments:

Requirement for phenols should be waived because they have not been detected to date and are not contaminants of concern at this facility. Lead, gross alpha, and gross beta are only required during the first year under 40 CFR 265. Although lead may have been discharged to the facility, it has not been detected to date. Gross beta is better assessed by monitoring ⁹⁰Sr under other programs at this and/or nearby wells.

Metals and anions only required annually under 40 CFR 265. Have been exceeding this requirement in the past.

Current Analytical Class/Par

Frequency: See analyte

ICP-M F sa

Anions sa

Gross B sa

Gross A sa

Lead (F) sa

Phenols a

Sp Cond 4x sa

pH 4x sa

TOC 4x sa

TOX 4x sa

Turb sa

Alk sa

Proposed Analytical Class/Par

Frequency: See analyte

ICP-M (F) a

Anions a

Sp Cond 4x sa

pH 4x sa

TOC 4x sa

TOX 4x sa

Turb sa

Alk a

Well #: 199-N-2
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:
NA

Purpose for Monitoring Well:

Original: NA

Current: Monitor strontium 90 near 1301-N and track COPC.

Recommendation for Consolidated Monitoring Program:

Add well to monitoring network.

Changes from current to proposed based on:

See comments

Comments:

Not on original list. Need to pick up well N-2 so that we have a backup when N-67 goes dry.

**Current Analytical Class/Par
Frequency:**

**Proposed Analytical Class/Par
Frequency: Annual**
ICP-M (F)
Anions
H3
Sr-90
Gross Beta
Sp Cond
pH
Turb
Temp

Well #: 199-N-2
Program: Ground-Water Surveillance

Responsible Contractor: PNNL
Contact: S. P. Luttrell
Phone: 376-6023

Monitoring Program Driver:

DOE Orders 5400.1, 5400.5; Atomic Energy Act Section 84; Washington State Law/rcw 70.98; Public Assurance; Natural Resource Damage Assessment

Purpose for Monitoring Well:

Original: Monitor Sr-90 within the plume.

Current: Not needed.

Recommendation for Consolidated Monitoring Program:

Discontinue monitoring this well.

Changes from current to proposed based on:

Purpose Fulfilled

Comments:

Other wells can be used to define plume.

Current Analytical Class/Par

Frequency: Annual

Anions

H3

Sr-90

Sr-90F

Proposed Analytical Class/Par

Frequency:

Well #: 199-N-3
Program: RCRA 1301

Responsible Contractor: WHC
Contact: Mary Hartman
Phone: 376-9924

Monitoring Program Driver:
40 CFR 265, Subpart F

Purpose for Monitoring Well:

Original: Downgradient compliance
Current: Same

Recommendation for Consolidated Monitoring Program:
Continue monitoring this well.

Changes from current to proposed based on:

Contaminant Trends
See comments

Comments:

Requirement for phenols should be waived because they have not been detected to date and are not contaminants of concern at this facility. Lead, gross alpha, and gross beta are only required during the first year under 40 CFR 265. Although lead may have been discharged to the facility, it has not been detected to date. Gross beta is better assessed by monitoring ⁹⁰Sr under other programs at this and/or nearby wells.

Metals and anions only required annually under 40 CFR 265. Have been exceeding this requirement in the past.

Current Analytical Class/Par

Frequency: See analyte

ICP-M F sa
Anions sa
Gross B sa
Gross A sa
Lead (F) sa
Phenols a
Sp Cond 4x sa
pH 4x sa
TOC 4x sa
TOX 4x sa
Turb sa
Alk sa

Proposed Analytical Class/Par

Frequency: See analyte

ICP-M (F) a
Anions a
Sp Cond 4x sa
pH 4x sa
TOC 4x sa
TOX 4x sa
Turb sa
Alk a

Well #: 199-N-3
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

100 NPL Agreement/Change Control Form No. 33, 9/23/92

Purpose for Monitoring Well:

Original: Assist in determination of groundwater contamination.

Current: Sr-90 plume near 1301-N, H3 plume, and track inorganic COPC.

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

Contaminant Distribution

Comments:

Will monitor only contaminants of interest in that area.

Current Analytical Class/Par

Frequency: Semiannual

ICP-M F
 ICP-M U
 Anions
 H3
 Sr-90
 Gross B
 Gross A
 Gamma Scan
 Sp Cond
 pH
 Turb
 TPH
 O&G
 Temp

Proposed Analytical Class/Par

Frequency: Semiannual

ICP-M (F)
 Anions
 H3
 Sr-90
 Gross Beta
 Sp Cond
 pH
 Turb
 Temp

Well #: 199-N-3
Program: ERA Performance Monitoring

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

Result of DQO workshop between DOE, Ecology and EPA.

Purpose for Monitoring Well:

Original:

Current: Assess the impacts of the N-Spring ERA Pump and Treat on the aquifer.

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well according to Performance Monitoring Plan.

Changes from current to proposed based on:

Comments:

Current Analytical Class/Par

Frequency: Monthly

Sr-90

pH

Temp

Cond

Eh

Ca, Mg, SO₄

TPH

Proposed Analytical Class/Par

Frequency: Monthly

Sr-90

pH

Temp

Cond

Eh

Ca, Mg, SO₄

TPH

Well #: 199-N-3
Program: Ground-Water Surveillance

Responsible Contractor: PNNL
Contact: S. P. Luttrell
Phone: 376-6023

Monitoring Program Driver:

DOE Orders 5400.1, 5400.5; Atomic Energy Act Section 84; Washington State Law/rcw 70.98;
 Public Assurance; Natural Resource Damage Assessment

Purpose for Monitoring Well:

Original: Define west edge of tritium plume; define north edge of sulfate plume; monitor other
 rads for their absence/presence.

Current: Same

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

Purpose Fulfilled

Comments:

Other contaminants not significant.

Current Analytical Class/Par

Frequency: Annual

VOC

H3

Sr-90

SR-90 F

Gross B

Gross A

Gamma Scan

I-129

Tc-99

U-isotopic

Proposed Analytical Class/Par

Frequency: Annual

Anions

H3

Gross Alpha

Gamma Scan

Well #: 199-N-5
Program: Ground-Water Surveillance

Responsible Contractor: PNNL
Contact: S. P. Luttrell
Phone: 376-6023

Monitoring Program Driver:

DOE Orders 5400.1, 5400.5; Atomic Energy Act Section 84; Washington State Law/rcw 70.98; Public Assurance; Natural Resource Damage Assessment

Purpose for Monitoring Well:

Original: Define west edge of Sr-90 above DCG; define west edge of tritium plume; define northeast edge of sulfate plume.

Current: Same

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

Comments:

Current Analytical Class/Par

Frequency: Annual

Anions

H3

Sr-90

Proposed Analytical Class/Par

Frequency: Annual

Anions

H3

Sr-90

Well #: 199-N-8T
Program: NPDES

Responsible Contractor: WHC
Contact: J. P. Zoric
Phone: 373-4315

Monitoring Program Driver:
National Pollutants Discharge Elimination System (NPDES) Permit (No. WA-00374-3)

Purpose for Monitoring Well:

Original: Compliance Monitoring for Hanford Site National Pollutant Discharge Elimination System Permit (NPDES) No. WA-000374-3.

Current: Same

Recommendation for Consolidated Monitoring Program:
Continue monitoring this well.

Changes from current to proposed based on:

Comments:

None.

Current Analytical Class/Par

Frequency: Quarterly

Iron
Ammonia
O&G
Temp
Chromium
pH

Proposed Analytical Class/Par

Frequency: Quarterly

Iron
Ammonia
O&G
Temp
Chromium
pH

Well #: 199-N-14
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:
NA

Purpose for Monitoring Well:

Original: NA
Current: NA

Recommendation for Consolidated Monitoring Program:

Add to program to track plumes near 1301-N facility.

Changes from current to proposed based on:

NA

Comments:

**Current Analytical Class/Par
Frequency:**

**Proposed Analytical Class/Par
Frequency: Semiannual**

Sp Cond

pH

Temp

Turb

Anions

ICP-M (F)

Gross Beta

Sr-90

H3

Well #: 199-N-14
Program: ERA Performance Monitoring

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

Result of DQO workshop between DOE, Ecology and EPA.

Purpose for Monitoring Well:

Original:

Current: Assess the impacts of the N-Spring ERA Pump and Treat on the aquifer.

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well according to Performance Monitoring Plan.

Changes from current to proposed based on:

Comments:

Current Analytical Class/Par

Frequency: Monthly

Sr-90

pH

Temp

Cond

Eh

Ca, Mg, SO4

Proposed Analytical Class/Par

Frequency: Semiannual

Sr-90

pH

Temp

Cond

Eh

Ca, Mg, SO4

Well #: 199-N-14
Program: Ground-Water Surveillance

Responsible Contractor: PNNL
Contact: S. P. Luttrell
Phone: 376-6023

Monitoring Program Driver:

DOE Orders 5400.1, 5400.5; Atomic Energy Act Section 84; Washington State Law/rcw 70.98; Public Assurance; Natural Resource Damage Assessment

Purpose for Monitoring Well:

Original: Define northeast edge of Sr-90 plume above DCG; monitor Sr-90 and tritium trends; evaluate presence/absence of other contaminants.

Current: Define northeast edge of Sr-90 plume above DCG; monitor Sr-90 and tritium trends; evaluate presence/absence of other contaminants.

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

Purpose Fulfilled

Comments:

Other contaminants not significant.

Current Analytical Class/Par

Frequency: Annual

VOC

ICP-M F

ICP-M U

Anions

H3

Sr-90

SR-90 F

Gross Bt

Gross A

Gamma Scan

I-129

Tc-99

U-iso.

Proposed Analytical Class/Par

Frequency: Annual

H3

Sr-90

Gross Alpha

Gamma Scan

I-129

Tc-99

Well #: 199-N-16
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

100 NPL Agreement/Change Control Form No. 33, 9/23/92

Purpose for Monitoring Well:

Original: Assist in determination of groundwater contamination.

Current: South end of Sr-90 plume, diesel, and track inorganic COPC's.

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

See comment

Comments:

Changed analytical list to sample for filtered metals only because sediment in water affect unfiltered analyses. Deleted tritium, plume monitored by other wells.

Current Analytical Class/Par

Frequency: Semiannual

ICP-M F
 ICP-M U
 Anions
 H3
 Sr-90
 Gross B
 Gross A
 Gamma Scan
 Sp Cond
 pH
 Turb
 TPH
 O&G
 Temp

Proposed Analytical Class/Par

Frequency: Annual

ICP-M (F)
 Anions
 Sr-90
 Gross Beta
 Sp Cond
 pH
 Turb
 TPH
 O&G
 Temp

Well #: 199-N-16
Program: Ground-Water Surveillance

Responsible Contractor: PNNL
Contact: S. P. Luttrell
Phone: 376-6023

Monitoring Program Driver:

DOE Orders 5400.1, 5400.5; Atomic Energy Act Section 84; Washington State Law/rcw 70.98; Public Assurance; Natural Resource Damage Assessment

Purpose for Monitoring Well:

Original: Not sampled for this program; used other programs' data.

Current: Define south edge of sulfate plume and southwest edge of Sr-90 plume.

Recommendation for Consolidated Monitoring Program:

Add well to program.

Changes from current to proposed based on:

Programmatic

Comments:

Other programs do not analyze these constituents.

**Current Analytical Class/Par
Frequency:**

**Proposed Analytical Class/Par
Frequency: Annual**
Anions
Sr-90

Well #: 199-N-17
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

100 NPL Agreement/Change Control Form No. 33, 9/23/92

Purpose for Monitoring Well:

Original: Assist in determination of groundwater contamination.

Current: Track diesel contamination.

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

See comment

Comments:

Well contains floating product. Depending on the amount of product, we are unable to sample for extended analytical lot.

Current Analytical Class/Par

Frequency: Semiannual

ICP-M F
 ICP-M U
 Anions
 H3
 Sr-90
 Gross B
 Gross A
 Gamma Scan
 Sp Cond
 pH
 Turb
 TPH
 O&G
 Temp

Proposed Analytical Class/Par

Frequency: Annual

Sp Cond
 pH
 TPH
 O&G
 Temp
 Turb

Well #: 199-N-18
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

100 NPL Agreement/Change Control Form No. 33, 9/23/92

Purpose for Monitoring Well:

Original: Assist in determination of ground water contamination.

Current: Track diesel hits.

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

See comment

Comments:

Well contains floating product. Because of the product, we are unable to sample for extended analytical lot.

Current Analytical Class/Par

Frequency: Semiannual

ICP-M F

ICP-M U

H3

SR-90

Gross B

Gross A

Gamma Scan

Sp Cond

pH

Turb

TPH

O&G

Proposed Analytical Class/Par

Frequency: Annual

Sp Cond

pH

TPH

O&G

Temp

Turb

Well #: 199-N-18
Program: Ground-Water Surveillance

Responsible Contractor: PNNL
Contact: S. P. Luttrell
Phone: 376-6023

Monitoring Program Driver:

DOE Orders 5400.1, 5400.5; Atomic Energy Act Section 84; Washington State Law/rcw 70.98; Public Assurance; Natural Resource Damage Assessment

Purpose for Monitoring Well:

Original: Not sampled for this program.

Current: Define sulfate and tritium plumes.

Recommendation for Consolidated Monitoring Program:

Add well to program.

Changes from current to proposed based on:

See comment

Comments:

Takes the place of other wells.

**Current Analytical Class/Par
Frequency:**

**Proposed Analytical Class/Par
Frequency: Annual
Anions
H3**

Well #: 199-N-19
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

100 NPL Agreement/Change Control Form No. 33, 9/23/92

Purpose for Monitoring Well:

Original: Assist in determination of groundwater contamination.

Current: None

Recommendation for Consolidated Monitoring Program:

Discontinue monitoring this well.

Changes from current to proposed based on:

Purpose Fulfilled

Comments:

Current Analytical Class/Par

Frequency: Semiannual

TPH

O&G

Proposed Analytical Class/Par

Frequency:

Well #: 199-N-19
Program: Ground-Water Surveillance

Responsible Contractor: PNNL
Contact: S. P. Luttrell
Phone: 376-6023

Monitoring Program Driver:

DOE Orders 5400.1, 5400.5; Atomic Energy Act Section 84; Washington State Law/rcw 70.98;
Public Assurance; Natural Resource Damage Assessment

Purpose for Monitoring Well:

Original: Not sampled for this program; used other programs' data.

Current: Define west edge of Sr-90 plume; monitor nitrate, which has been above the MCL.

Recommendation for Consolidated Monitoring Program:

Add well to program.

Changes from current to proposed based on:

Programmatic

Comments:

Other programs do not analyze these constituents.

**Current Analytical Class/Par
Frequency:**

**Proposed Analytical Class/Par
Frequency: Annual
Anions
Sr-90**

Well #: 199-N-20
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

100 NPL Agreement/Change Control Form No. 33, 9/23/92

Purpose for Monitoring Well:

Original: Assist in determination of groundwater contamination

Current:

Recommendation for Consolidated Monitoring Program:

Discontinue monitoring this well.

Changes from current to proposed based on:

Purpose Fulfilled

Comments:

Current Analytical Class/Par

Frequency: Semiannual

TPH

O&G

Proposed Analytical Class/Par

Frequency:

Well #: 199-N-21
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

100 NPL Agreement/Change Control Form No. 33, 9/23/92

Purpose for Monitoring Well:

Original: Assist in determination of groundwater contamination.

Current:

Recommendation for Consolidated Monitoring Program:

Discontinue monitoring this well.

Changes from current to proposed based on:

Outside of tritium and ⁹⁰Sr plume, but still within sulfate and sodium plume.

Comments:

Current Analytical Class/Par

Frequency: Semiannual

ICP-M F
ICP-M U
Anions
H3
Sr-90
Gross B
Gross A
Gamma Scan
Sp Cond
pH
Turb
TPH
O&G
Temp

Proposed Analytical Class/Par

Frequency: Annual

ICP-M (F)
Anions
Sp Cond.
pH
Temp
Turb

Well #: 199-N-25
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

100 NPL Agreement/Change Control Form No. 33, 9/23/92

Purpose for Monitoring Well:

Original: Assist in determination of groundwater contamination.

Current:

Recommendation for Consolidated Monitoring Program:

Discontinue monitoring this well.

Changes from current to proposed based on:

Purpose Fulfilled

Comments:

Current Analytical Class/Par

Frequency: Semiannual

ICP-M F

ICP-M U

Anions

H3

Sr-90

Gross B

Gross A

Gamma Scan

Sp Cond

pH

Turb

TPH

O&G

Temp

Proposed Analytical Class/Par

Frequency:

Well #: 199-N-26
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

100 NPL Agreement/Change Control Form No. 33, 9/23/92

Purpose for Monitoring Well:

Original: Assist in determination of groundwater contamination.

Current:

Recommendation for Consolidated Monitoring Program:

Discontinue monitoring this well.

Changes from current to proposed based on:

Purpose Fulfilled

Comments:

Current Analytical Class/Par

Frequency: Semiannual

ICP-M F

ICP-M U

Anions

H3

Sr-90

Gross B

Gross A

Gamma Scan

Sp Cond

pH

Turb

TPH

O&G

Temp

Proposed Analytical Class/Par

Frequency:

Well #: 199-N-26
Program: Ground-Water Surveillance

Responsible Contractor: PNNL
Contact: S. P. Luttrell
Phone: 376-6023

Monitoring Program Driver:

DOE Orders 5400.1, 5400.5; Atomic Energy Act Section 84; Washington State Law/rcw 70.98; Public Assurance; Natural Resource Damage Assessment

Purpose for Monitoring Well:

Original: Not sampled for this program; used other programs' data.

Current: Define southwest edge of sulfate plume. Nitrate above MCL. Track Sr-90 contamination.

Recommendation for Consolidated Monitoring Program:

Add well to program.

Changes from current to proposed based on:

Programmatic

Comments:

Other programs do not analyze this constituent.

Current Analytical Class/Par

Frequency:

Proposed Analytical Class/Par

Frequency: Annual

Anions

Sr-90

Well #: 199-N-27
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: Jane Borghese
Phone: 373-4790

Monitoring Program Driver:
NA

Purpose for Monitoring Well:

Original: NA

Current: NA

Recommendation for Consolidated Monitoring Program:

Add to program to track plumes near 1301-N facility.

Changes from current to proposed based on:

NA

Comments:

**Current Analytical Class/Par
Frequency:**

**Proposed Analytical Class/Par
Frequency: Annual**

Sp Cond

pH

Temp

Turb

Anions

ICP-M (F)

Gamma Scan

H3

alpha

Well #: 199-N-27
Program: RCRA 1325

Responsible Contractor: WHC
Contact: Mary Hartman
Phone: 376-9924

Monitoring Program Driver:
40 CFR 265, Subpart F

Purpose for Monitoring Well:

Original: Downgradient compliance
Current: None

Recommendation for Consolidated Monitoring Program:
Discontinue monitoring this well.

Changes from current to proposed based on:
Flow Direction

Comments:

Well was downgradient while effluent was discharged to 1325-N, but is no longer downgradient, although groundwater here is contaminated. The well does not add to monitoring efficiency.

Current Analytical Class/Par

Frequency: See analyte

ICP-M F sa

Anions sa

Gross B sa

Gross A sa

Lead (F) sa

Phenols a

Sp Cond 4x sa

pH 4x sa

TOC 4x sa

TOX 4x sa

Turb sa

Alk sa

Proposed Analytical Class/Par

Frequency:

Well #: 199-N-28
Program: RCRA 1325

Responsible Contractor: WHC
Contact: Mary Hartman
Phone: 376-9924

Monitoring Program Driver:
40 CFR 265, Subpart F

Purpose for Monitoring Well:

Original: Not in network

Current: Monitor effects of injected water.

Recommendation for Consolidated Monitoring Program:

Add well to program.

Changes from current to proposed based on:

See comments

Comments:

Well should be monitored for information only (not as an upgradient or downgradient well) to assess the chemical impacts of the treated water being injected in N-29 or N-104.

Current Analytical Class/Par

Frequency: See analyte

Proposed Analytical Class/Par

Frequency: See analyte

ICP-M (F) a

Anions a

Sp Cond 4x sa

pH 4x sa

TOC 4x sa

TOX 4x sa

Turb sa

Alk a

Well #: 199-N-28
Program: Ground-Water Surveillance

Responsible Contractor: PNNL
Contact: S. P. Luttrell
Phone: 376-6023

Monitoring Program Driver:

DOE Orders 5400.1, 5400.5; Atomic Energy Act Section 84; Washington State Law/rcw 70.98; Public Assurance; Natural Resource Damage Assessment

Purpose for Monitoring Well:

Original: Monitor Sr-90 and tritium plumes.

Current: Define southeast edge of Sr-90 plume.

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

Purpose Fulfilled

Comments:

Other constituents not necessary.

Current Analytical Class/Par

Frequency: Annual

ICP-M F

Anions

H3

Sr-90

Proposed Analytical Class/Par

Frequency: Annual

Sr-90

Well #: 199-N-29
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

Purpose for Monitoring Well:

Original: Assist in determination of groundwater contamination.

Current: Added to list when rad analyses dropped by RCRA.

Recommendation for Consolidated Monitoring Program:

Discontinue monitoring this well.

Changes from current to proposed based on:

Purpose Fulfilled

Comments:

Using another nearby well to track Sr-90, H3 and COPC.

Current Analytical Class/Par

Frequency: Semiannual

ICP-M F

ICP-M U

Anions

H3

Sr-90

Gross B

Gross A

Gamma Scan

Sp Cond

pH

Turb

TPH

O&G

Temp

Proposed Analytical Class/Par

Frequency:

Well #: 199-N-31
Program: ERA Performance Monitoring

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

Result of DQO workshop between DOE, Ecology and EPA.

Purpose for Monitoring Well:

Original:

Current: Assess the impacts of the N-Spring ERA Pump and Treat on the aquifer.

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well according to Performance Monitoring Plan.

Changes from current to proposed based on:

Comments:

Current Analytical Class/Par

Frequency: Monthly

Sr-90

pH

Temp

Cond

Eh

Proposed Analytical Class/Par

Frequency: Semiannual

Sr-90

pH

Temp

Cond

Eh

Well #: 199-N-32
Program: RCRA 1325

Responsible Contractor: WHC
Contact: Mary Hartman
Phone: 376-9924

Monitoring Program Driver:
40 CFR 265, Subpart F

Purpose for Monitoring Well:

Original: Downgradient compliance
Current: Same

Recommendation for Consolidated Monitoring Program:
Continue monitoring this well.

Changes from current to proposed based on:
Contaminant Trends
See comments

Comments:

Requirement for phenols should be waived because they have not been detected to date and are not contaminants of concern at this facility. Lead, gross alpha, and gross beta are only required during the first year under 40 CFR 265. Although lead may have been discharged to the facility, it has not been detected to date. Gross beta is better assessed by monitoring ⁹⁰Sr under other programs at this and/or nearby wells.

Metals and anions only required annually under 40 CFR 265. Have been exceeding this requirement in the past.

Current Analytical Class/Par

Frequency: See analyte

ICP-M F sa
Anions sa
Gross B sa
Gross A sa
Lead (F) sa
Phenols a
Sp Cond 4x sa
pH 4x sa
TOC 4x sa
TOX 4x sa
Turb sa
Alk sa

Proposed Analytical Class/Par

Frequency: Semiannual

ICP-M (F)
Anions
Sp Cond 4x
pH 4x
TOC 4x
TOX 4x
Turb
Alk

Well #: 199-N-32
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

100 NPL Agreement/Change Control Form No. 33, 9/23/92

Purpose for Monitoring Well:

Original: Assist in determination of groundwater contamination.

Current: SR-90 plume near 1325-N H3 Plume, and track COPC's.

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

Contaminant Distribution

Comments:

Monitors only contaminants of interest near this location.

Current Analytical Class/Par

Frequency: Semiannual

ICP-M F
ICP-M U
Anions
H3
Sr-90
Gross B
Gross A
Gamma Scan
Sp Cond
pH
Turb
Temp

Proposed Analytical Class/Par

Frequency: Semiannual

ICP-M (F)
Anions
H3
Sr-90
Gross Beta
Sp Cond
pH
Turb
Temp
Gamma Scan

Well #: 199-N-33
Program: Ground-Water Surveillance

Responsible Contractor: PNNL
Contact: S. P. Luttrell
Phone: 376-6023

Monitoring Program Driver:

DOE Orders 5400.1, 5400.5; Atomic Energy Act Section 84; Washington State Law/rcw 70.98; Public Assurance; Natural Resource Damage Assessment

Purpose for Monitoring Well:

Original: Not previously used by this program.

Current: Co-60 above MCL - continue to evaluate trend.

Recommendation for Consolidated Monitoring Program:

Add well to program.

Changes from current to proposed based on:

Contaminant Trends

Comments:

Co-60 detected above the MCL.

**Current Analytical Class/Par
Frequency:**

**Proposed Analytical Class/Par
Frequency: Annual**
ICP-M (F)
ICP-M U
Gamma Scan
Gamma Scan-Filtered

Well #: 199-N-34
Program: RCRA 1301

Responsible Contractor: WHC
Contact: Mary Hartman
Phone: 376-9924

Monitoring Program Driver:
 40 CFR 265, Subpart F

Purpose for Monitoring Well:

Original: Upgradient
Current: Same

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

Contaminant Trends
 See comments

Comments:

Requirement for phenols should be waived because they have not been detected to date and are not contaminants of concern at this facility. Lead, gross alpha, and gross beta are only required during the first year under 40 CFR 265. Although lead may have been discharged to the facility, it has not been detected to date. Gross beta is better assessed by monitoring ⁹⁰Sr under other programs at this and/or nearby wells.

Metals and anions only required annually under 40 CFR 265. Have been exceeding this requirement in the past.

Current Analytical Class/Par

Frequency: See analyte

ICP-M F sa

Anions sa

Gross B sa

Gross A sa

Lead (F) sa

Phenols a

Sp Cond 4x sa

pH 4x sa

TOC 4x sa

TOX 4x sa

Turb sa

Alk sa

Proposed Analytical Class/Par

Frequency: See analyte

ICP-M (F) a

Anions a

Sp Cond 4x sa

pH 4x sa

TOC 4x sa

TOX 4x sa

Turb sa

Alk a

Well #: 199-N-34
Program: Ground-Water Surveillance

Responsible Contractor: PNNL
Contact: S. P. Luttrell
Phone: 376-6023

Monitoring Program Driver:

DOE Orders 5400.1, 5400.5; Atomic Energy Act Section 84; Washington State Law/rcw 70.98; Public Assurance; Natural Resource Damage Assessment

Purpose for Monitoring Well:

Original: Not previously used by this program.

Current: Define south central part of Sr-90 plume.

Recommendation for Consolidated Monitoring Program:

Add well to program.

Changes from current to proposed based on:

Programmatic

Comments:

Other programs no longer sampling.

**Current Analytical Class/Par
Frequency:**

**Proposed Analytical Class/Par
Frequency: Annual
Sr-90**

Well #: 199-N-41
Program: RCRA 1325

Responsible Contractor: WHC
Contact: Mary Hartman
Phone: 376-9924

Monitoring Program Driver:
 40 CFR 265, Subpart F

Purpose for Monitoring Well:

Original: Downgradient compliance

Current: Same

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

Contaminant Trends

See comments

Comments:

Requirement for phenols should be waived because they have not been detected to date and are not contaminants of concern at this facility. Lead, gross alpha, and gross beta are only required during the first year under 40 CFR 265. Although lead may have been discharged to the facility, it has not been detected to date. Gross beta is better assessed by monitoring ⁹⁰Sr under other programs at this and/or nearby wells.

Metals and anions only required annually under 40 CFR. 265. Have been exceeding this requirement in the past.

Current Analytical Class/Par

Frequency: See analyte

ICP-M F sa

Anions sa

Gross B sa

Gross A sa

Lead (Pb) sa

Phenols a

Sp Cond 4x sa

pH 4x sa

TOC 4x sa

TOX 4x sa

Turb sa

Alk sa

Proposed Analytical Class/Par

Frequency: See analyte

ICP-M (F) a

Anions a

Sp Cond 4x sa

pH 4x sa

TOC 4x sa

TOX 4x sa

Turb sa

Alk a

Well #: 199-N-41
Program: Ground-Water Surveillance

Responsible Contractor: PNNL
Contact: S. P. Luttrell
Phone: 376-6023

Monitoring Program Driver:

DOE Orders 5400.1, 5400.5; Atomic Energy Act Section 84; Washington State Law/rcw 70.98; Public Assurance; Natural Resource Damage Assessment

Purpose for Monitoring Well:

Original: Not previously sampled by this program.

Current: Define northeast side of Sr-90 plume.

Recommendation for Consolidated Monitoring Program:

Add well to program.

Changes from current to proposed based on:

Programmatic

Comments:

Other programs no longer analyzing Sr-90

Current Analytical Class/Par

Frequency:

Proposed Analytical Class/Par

Frequency: Annual

Sr-90

Well #: 199-N-43
Program: RCRA 1325

Responsible Contractor: WHC
Contact: Mary Hartman
Phone: 376-9924

Monitoring Program Driver:
40 CFR 265, Subpart F

Purpose for Monitoring Well:

Original: Downgradient compliance
Current: None

Recommendation for Consolidated Monitoring Program:
Discontinue monitoring this well.

Changes from current to proposed based on:
See comments

Comments:

Well was thought to be required to monitor the northern part of the trench. However, only the first one-quarter of the trench was used. Re-ran MEMO simulation with crib plus only about 750 ft. of trench was waste source; efficiency is 97% with only wells N-32, N-81, and N-41.

Current Analytical Class/Par

Frequency: See analyte

ICP-M F sa

ICP-M U

Anions sa

Gross B sa

Gross A sa

Lead (F) sa

Phenols a

Sp Cond 4x sa

pH 4x sa

TOC 4x sa

TOX 4x sa

Turb sa

Alk sa

Proposed Analytical Class/Par

Frequency:

Well #: 199-N-46
Program: ERA Performance Monitoring

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

Result of DQO workshop between DOE, Ecology and EPA.

Purpose for Monitoring Well:

Original:

Current: Assess the impacts of the N-Spring ERA Pump and Treat on the aquifer.

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well according to Performance Monitoring Plan.

Changes from current to proposed based on:

Comments:

* Sampling frequency may be adjusted to semi-annual.

Current Analytical Class/Par

Frequency: Monthly

Sr-90

pH

Temp

Cond

Eh

Proposed Analytical Class/Par

Frequency: Monthly *

Sr-90

pH

Temp

Cond

Eh

Well #: 199-N-46
Program: Liquid Effluent Monitoring

Responsible Contractor: WHC
Contact: J. Zoric/D. Dyekmen
Phone: 373-4315/373-4990

Monitoring Program Driver:
DOE Orders 5400.1 and 5400.5

Purpose for Monitoring Well:

Original: Effluent Monitoring well to comply with DOE order 5400.1 and 5400.5.

Current: Same

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

Contaminant Trends

Comments:

Reduction in frequency and analysis based on historical data and contaminant trends.

Current Analytical Class/Par

Frequency: Weekly Comp.

H3

Sr-90

Gross B

Gross A

Gamma Scan

Pu

Proposed Analytical Class/Par

Frequency: See analyte

H3-Monthly

Sr-90-Monthly

Gross Beta-

Annually

Gross Alpha-

Annually

Gamma Scan-

Annually

Well #: 199-N-47
Program: Ground-Water Surveillance

Responsible Contractor: PNNL
Contact: S. P. Luttrell
Phone: 376-6023

Monitoring Program Driver:

DOE Orders 5400.1, 5400.5; Atomic Energy Act Section 84; Washington State Law/rcw 70.98; Public Assurance; Natural Resource Damage Assessment

Purpose for Monitoring Well:

Original: Not previously sampled by this program.

Current: Define west side of Sr-90 plume.

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:
Programmatic

Comments:

Other programs not analyzing Sr-90.

**Current Analytical Class/Par
Frequency:**

**Proposed Analytical Class/Par
Frequency: Annual
Sr-90**

Well #: 199-N-47
Program: Near Field Monitoring

Responsible Contractor: WHC
Contact: C. J. Perkins
Phone: 373-4560

Monitoring Program Driver:

DOE Order 5400.1, 5400.5, 5484.1 and DOE/EH-0173T

Purpose for Monitoring Well:

Original: Leak detection: N Basin/107-N

Current: Leak detection: N Basin/107-N

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

Contaminant Trends

Comments:

Several year's of data indicate that reduced sampling frequency is a viable option.

Current Analytical Class/Par
Frequency: Monthly
Gamma Scan

Proposed Analytical Class/Par
Frequency: Quarterly
Gamma Scan

Well #: 199-N-48
Program: Near Field Monitoring

Responsible Contractor: WHC
Program: C. J. Perkins
Phone: 373-4560

Monitoring Program Driver:
DOE Order 5400.1, 5400.5, 5484.1 and DOE/EH-0173T

Purpose for Monitoring Well:

Original: Leak detection: N Basin/107-N
Current: Leak detection: N Basin/107-N

Recommendation for Consolidated Monitoring Program:
Continue monitoring this well.

Changes from current to proposed based on:
Contaminant Trends

Comments:
Several year's of data indicate that reduced sampling frequency is a viable option.

Current Analytical Class/Par
Frequency: Monthly
Gamma Scan

Proposed Analytical Class/Par
Frequency: Quarterly
Gamma Scan

Well #: 199-N-49
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

100 NPL Agreement/Change Control Form No. 33, 9/23/92

Purpose for Monitoring Well:

Original: Assist in determination of groundwater contamination.

Current:

Recommendation for Consolidated Monitoring Program:

Discontinue monitoring this well.

Changes from current to proposed based on:

Water Column

Comments on Changes:

Well is dry.

Current Analytical Class/Par

Frequency: Semiannual

ICP-M F

ICP-M U

Anions

H3

Sr-90

Gross B

Gross A

Gamma Scan

Sp Cond

pH

Turb

Temp

Proposed Analytical Class/Par

Frequency:

Well #: 199-N-50
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

100 NPL Agreement/Change Control Form No. 33, 9/23/92

Purpose for Monitoring Well:

Original: Assist in determination of groundwater contamination.

Current: North end of H3 plume.

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

Contaminant Distribution

Comments on Changes:

Monitors contaminant of interest near this location.

Current Analytical Class/Par

Frequency: Semiannual

ICP-M F
 ICP-M U
 Anions
 H3
 Sr-90
 Gross B
 Gross A
 Gamma Scan
 Sp Cond
 pH
 Turb
 Temp

Proposed Analytical Class/Par

Frequency: Annual

H3
 Gross Beta
 Sp Cond
 pH
 Temp
 Turb

Well #: 199-N-50
Program: Ground-Water Surveillance

Responsible Contractor: PNNL
Contact: S. P. Luttrell
Phone: 376-6023

Monitoring Program Driver:

DOE Orders 5400.1, 5400.5; Atomic Energy Act Section 84; Washington State Law/rcw 70.98; Public Assurance; Natural Resource Damage Assessment

Purpose for Monitoring Well:

Original: Not sampled for this program.

Current: Define north edge of the tritium plume.

Recommendation for Consolidated Monitoring Program:

Add well to program.

Changes from current to proposed based on:

Programmatic

Comments:

Other programs not analyzing tritium.

**Current Analytical Class/Par
Frequency:**

**Proposed Analytical Class/Par
Frequency: Annual
H3**

Well #: 199-N-51
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

100 NPL Agreement/Change Control Form No. 33, 9/23/92

Purpose for Monitoring Well:

Original: Assist in determination of groundwater contamination.

Current: H3 plume near well.

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

Contaminant Distribution

Comments:

Monitors contaminant of interest near this location.

Current Analytical Class/Par

Frequency: Semiannual

ICP-M F

ICP-M U

Anions

H3

Sr-90

Gross B

Gross A

Gamma Scan

Sp Cond

pH

Turb

Temp

Proposed Analytical Class/Par

Frequency: Annual

H3

Gross Beta

Sp Cond

pH

Temp

Turb

Well #: 199-N-51
Program: Ground-Water Surveillance

Responsible Contractor: PNNL
Contact: S. P. Luttrell
Phone: 376-6023

Monitoring Program Driver:

DOE Orders 5400.1, 5400.5; Atomic Energy Act Section 84; Washington State Law/rcw 70.98; Public Assurance; Natural Resource Damage Assessment

Purpose for Monitoring Well:

Original: Not sampled for this program.

Current: Define north edge of plume and Sr-90.

Recommendation for Consolidated Monitoring Program:

Add well to program.

Changes from current to proposed based on:

Programmatic

Comments:

Other programs not analyzing strontium.

**Current Analytical Class/Par
Frequency:**

**Proposed Analytical Class/Par
Frequency: Annual
Sr-90
Sr-90F**

Well #: 199-N-52
Program: Ground-Water Surveillance

Responsible Contractor: PNNL
Contact: S. P. Luttrell
Phone: 376-6023

Monitoring Program Driver:

DOE Orders 5400.1, 5400.5; Atomic Energy Act Section 84; Washington State Law/rcw 70.98; Public Assurance; Natural Resource Damage Assessment

Purpose for Monitoring Well:

Original: Define southeast edge of the tritium and Sr-90 plumes.

Current: Same

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

Comments:

Current Analytical Class/Par

Frequency: Annual

Anions

H3

Sr-90

Proposed Analytical Class/Par

Frequency: Annual

H3

Sr-90

Well #: 199-N-54
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

100 NPL Agreement/Change Control Form No. 33, 9/23/92

Purpose for Monitoring Well:

Original: Assist in determination of groundwater contamination.

Current: Sr-90 plume, diesel hit, and track inorganic COPC's.

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

Contaminant Distribution

Comments:

Monitors contaminants of interest near this location.

Current Analytical Class/Par

Frequency: Semiannual

ICP-M F

ICP-M U

Anions

H3

Sr-90

Gross B

Gross A

Gamma Scan

Sp Cond

pH

Turb

TPH

O&G

Temp

Proposed Analytical Class/Par

Frequency: Semiannual

ICP-M (F)

Anions

Sr-90

Gross Beta

Sp Cond

pH

Turb

TPH

O&G

Temp

Gamma scan

Well #: 199-N-57
Program: RCRA 1301

Responsible Contractor: WHC
Contact: Mary Hartman
Phone: 376-9924

Monitoring Program Driver:
 40 CFR 265, Subpart F

Purpose for Monitoring Well:

Original: Upgradient

Current: Same

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

Contaminant Trends

See comments

Comments:

Requirement for phenols should be waived because they have not been detected to date and are not contaminants of concern at this facility. Lead, gross alpha, and gross beta are only required during the first year under 40 CFR 265. Although lead may have been discharged to the facility, it has not been detected to date. Gross beta is better assessed by monitoring ⁹⁰Sr under other programs at this and/or nearby wells.

Metals and anions only required annually under 40 CFR 265. Have been exceeding this requirement in the past.

Current Analytical Class/Par

Frequency: See analyte

ICP-M F sa

Anions sa

Gross B sa

Gross A sa

Lead (F) sa

Phenols a

Sp Cond 4x sa

pH 4x sa

TOC 4x sa

TOX 4x sa

Turb sa

Alk sa

Proposed Analytical Class/Par

Frequency: See analyte

ICP-M (F) a

Anions a

Sp Cond 4x sa

pH 4x sa

TOC 4x sa

TOX 4x sa

Turb sa

Alk a

Well #: 199-N-57
Program: Ground-Water Surveillance

Responsible Contractor: PNNL
Contact: S. P. Luttrell
Phone: 376-6023

Monitoring Program Driver:

DOE Orders 5400.1, 5400.5; Atomic Energy Act Section 84; Washington State Law/rcw 70.98; Public Assurance; Natural Resource Damage Assessment

Purpose for Monitoring Well:

Original: Not sampled for this program.

Current: Define south edge of Sr-90 plume and southeast edge of sulfate plume.

Recommendation for Consolidated Monitoring Program:

Add well to program.

Changes from current to proposed based on:

Programmatic

Comments:

Other programs no longer analyzing Sr-90.

**Current Analytical Class/Par
Frequency:**

**Proposed Analytical Class/Par
Frequency: Annual
Sr-90**

Well #: 199-N-59
Program: RCRA 1324-N/NA

Responsible Contractor: WHC
Contact: Mary Hartman
Phone: 376-9924

Monitoring Program Driver:
40 CFR 265, Subpart F

Purpose for Monitoring Well:

Original: Downgradient compliance
Current: None

Recommendation for Consolidated Monitoring Program:
Continue monitoring this well.

Changes from current to proposed based on:
See comments

Comments:

Gross alpha and gross beta are only required during the first year under 40 CFR 265.

Current Analytical Class/Par

Frequency: Quarterly

ICP-M F

Anions

Gross B

Gross A

Sp Cond

pH

TOC

TOX

Turb

Alk

TDS

Proposed Analytical Class/Par

Frequency: See analyte

Sp Cond sa

pH sa

Turb sa

Alk a

Anions a

ICP-M (F) a

TOC sa

TOX sa

alpha a

Well #: 199-N-64
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

100 NPL Agreement/Change Control Form No. 33, 9/23/92

Purpose for Monitoring Well:

Original: Assist in determination of groundwater contamination.

Current: Sr-90 and H3 plume between 1301-N and 1325-N, and track COPC's.

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

Contaminant Distribution

Comments on Changes:

Monitors contaminants of interest near this location.

Current Analytical Class/Par

Frequency: Semiannual

ICP-M F

ICP-M U

Anions

H3

Sr-90

Gross B

Gross A

Gamma Scan

Sp Cond

pH

Turb

Temp

Proposed Analytical Class/Par

Frequency: Annual

ICP-M (F)

Anions

H3

Sr-90

Gross Beta

Sp Cond

pH

Turb

Temp

Well #: 199-N-66
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

100 NPL Agreement/Change Control Form No. 33, 9/23/92

Purpose for Monitoring Well:

Original: Assist in determination of groundwater contamination.

Current:

Recommendation for Consolidated Monitoring Program:

Discontinue monitoring this well.

Changes from current to proposed based on:

Water Column

Comments on Changes:

Well dry.

Current Analytical Class/Par

Frequency: Semiannual

ICP-M F

ICP-M U

Anions

H3

Sr-90

Gross B

Gross A

Gamma Scan

Sp Cond

pH

Turb

Temp

Proposed Analytical Class/Par

Frequency:

Well #: 199-N-67
 Program: RCRA 1301

Responsible Contractor: WHC
 Contact: Mary Hartman
 Phone: 376-9924

Monitoring Program Driver:
 40 CFR 265, Subpart F

Purpose for Monitoring Well:

Original: Downgradient compliance
Current: None

Recommendation for Consolidated Monitoring Program:
 Discontinue monitoring this well.

Changes from current to proposed based on:

Water Column
 See comment

Comments:

Well has little water and may not be sampled in the future.

Monitoring efficiency has been re-evaluated and this well does not add to efficiency of network; Wells N-67 and N-2 are redundant and both are not needed. Monitoring efficiency is highest with well N-2 in the network.

Current Analytical Class/Par

Frequency: See analyte

ICP-M F sa
 Anions sa
 Gross B sa
 Gross A sa
 Lead (F) sa
 Phenols a
 Sp Cond 4x sa
 pH 4x sa
 TOC 4x sa
 TOX 4x sa
 Turb sa
 Alk sa

Proposed Analytical Class/Par

Frequency:

Well #: 199-N-67
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:
100 NPL Agreement/Change Control Form No. 33, 9/23/92

Purpose for Monitoring Well:

Original: Assist in determination of groundwater contamination.
Current: Sr-90 plume near 1301-N, and track inorganic COPC.

Recommendation for Consolidated Monitoring Program:
Continue monitoring this well.

Changes from current to proposed based on:
Contaminant Distribution

Comments:
Monitors contaminant of interest near this location.

Current Analytical Class/Par
Frequency: Semiannual
ICP-M F
ICP-M U
Anions
H3
Sr-90
Gross B
Gross A
Gamma Scan
Sp Cond
pH
Turb
Temp

Proposed Analytical Class/Par
Frequency: Semiannual
ICP-M (F)
Anions
Sr-90
Gross Beta
Sp Cond
pH
Turb
Temp
alpha

Well #: 199-N-67
Program: ERA Performance Monitoring

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

Result of DQO workshop between DOE, Ecology and EPA.

Purpose for Monitoring Well:

Original:

Current: Assess the impacts of the N-Spring ERA Pump and Treat on the aquifer.

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well according to Performance Monitoring Plan.

Changes from current to proposed based on:

Comments:

* Sampling frequency may be adjusted to semi-annual.

Current Analytical Class/Par

Frequency: Monthly

Sr-90

pH

Temp

Cond

Eh

Ca, Mg, SO₄

Proposed Analytical Class/Par

Frequency: Monthly *

Sr-90

pH

Temp

Cond

Eh

Ca, Mg, SO₄

Well #: 199-N-67
Program: Ground-Water Surveillance

Responsible Contractor: PNNL
Contact: S. P. Luttrell
Phone: 376-6023

Monitoring Program Driver:

DOE Orders 5400.1, 5400.5; Atomic Energy Act Section 84; Washington State Law/rcw 70.98; Public Assurance; Natural Resource Damage Assessment

Purpose for Monitoring Well:

Original: Define southwest side of tritium plume; define Sr-90 above the DCG; evaluate Sr-90 trend; evaluate Sr-90 sorbed on particulate. Evaluate some other constituents.

Current: Same

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

Purpose Fulfilled

Comments:

Other constituents not significant.

Current Analytical Class/Par

Frequency: Annual

VOC

ICP-M U

H3

Sr-90

Sr-90 F

Gamma Scan

Tc-99

Total carbon

Proposed Analytical Class/Par

Frequency: Annual

H3

Sr-90

Sr-90 F

Well #: 199-N-69
Program: RCRA 1301

Responsible Contractor: WHC
Contact: Mary Hartman
Phone: 376-9924

Monitoring Program Driver:
40 CFR 265, Subpart F

Purpose for Monitoring Well:

Original: Characterization
Current: None

Recommendation for Consolidated Monitoring Program:
Discontinue monitoring this well.

Changes from current to proposed based on:
Purpose Fulfilled

Comments:

Well has met original purpose of determining thickness of uppermost aquifer and vertical distribution of contaminants. ⁹⁰Sr is not detected in this well, which monitors the bottom of the uppermost aquifer.

Current Analytical Class/Par

Frequency: See analyte

ICP-M F sa
Anions sa
Gross B sa
Gross A sa
Lead (F) sa
Phenols a
Sp Cond 4x sa
pH 4x sa
TOC 4x sa
TOX 4x sa
Turb sa
Alk sa

Proposed Analytical Class/Par

Frequency:

Well #: 199-N-69
Program: Ground-Water Surveillance

Responsible Contractor: PNNL
Contact: S. P. Luttrell
Phone: 376-6023

Monitoring Program Driver:

DOE Orders 5400.1, 5400.5; Atomic Energy Act Section 84; Washington State Law/rcw 70.98; Public Assurance; Natural Resource Damage Assessment

Purpose for Monitoring Well:

Original: Monitor Sr-90 deeper in the aquifer. Evaluate other constituents.

Current: Same

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

Purpose Fulfilled

Comments:

Other constituents not significant.

Current Analytical Class/Par

Frequency: Annual

VOC

ICP-M U

H3

Sr-90

Gamma Scan

Total carbon

Proposed Analytical Class/Par

Frequency: Annual

H3

Sr-90

Well #: 199-N-70
Program: RCRA 1325

Responsible Contractor: WHC
Contact: Mary Hartman
Phone: 376-9924

Monitoring Program Driver:
40 CFR 265, Subpart F

Purpose for Monitoring Well:

Original: Characterization

Current: None

Recommendation for Consolidated Monitoring Program:

Discontinue monitoring this well.

Changes from current to proposed based on:

Purpose Fulfilled

Comments:

Well has met original purpose of determining thickness of uppermost aquifer and vertical distribution of contaminants. ⁹⁰Sr is not detected in this well, which monitors the bottom of the uppermost aquifer.

Current Analytical Class/Par

Frequency: See analyte

ICP-M F sa
Anions sa
Gross B sa
Gross A sa
Lead (F) sa
Phenols a
Sp Cond 4x sa
pH 4x sa
TOC 4x sa
TOX 4x sa
Turb sa
Alk sa

Proposed Analytical Class/Par

Frequency:

Well #: 199-N-70
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:
100 NPL Agreement/Change Control Form No. 33, 9/23/92

Purpose for Monitoring Well:

Original: Assist in determination of groundwater contamination.
Current: Sr-90 plumes near 1301-N, and track inorganic COPC's.

Recommendation for Consolidated Monitoring Program:
Continue monitoring this well.

Changes from current to proposed based on:
Constituent trends indicate amount of sampling is sufficient.

Comments:

Current Analytical Class/Par

Frequency: Semiannual

ICP-M F
ICP-M U
Anions
H3
Sr-90
Gross B
Gross A
Gamma Scan
Sp Cond
pH
Turb
TPH
O&G
Temp

Proposed Analytical Class/Par

Frequency: Annual

Sp Cond
pH
Temp
Turb
Anions
ICP-M (F)
Gross Beta
Gamma Scan
Sr-90
H3
alpha

Well #: 199-N-71
Program: RCRA 1324

Responsible Contractor: WHC
Contact: Mary Hartman
Phone: 376-9924

Monitoring Program Driver:
 40 CFR 265, Subpart F

Purpose for Monitoring Well:

Original: Upgradient well
Current: Same

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

Contaminant Trends
 See comments

Comments:

Requirement for phenols should be waived because they have not been detected to date and are not contaminants of concern at this facility. Lead, gross alpha, and gross beta are only required during the first year under 40 CFR 265 and are not contaminants of concern at this facility.

(a) 1324-N/NA has been under assessment monitoring for TOX. Assessment program has achieved its goal and site will revert to indicator evaluation monitoring (semiannual sampling).

(b) Metals and anions only required annually under 40 CFR 265. Have been exceeding this requirement in the past.

Current Analytical Class/Par

Frequency: Quarterly

ICP-M F
 Anions
 Gross B
 Gross A
 Sp Cond
 pH
 TOC
 TOX
 Turb
 Alk
 TDS

Proposed Analytical Class/Par

Frequency: See analyte

ICP-M (F) a
 Anions a
 Sp Cond 4x sa
 pH 4x sa
 TOC 4x sa
 TOX 4x sa
 Turb sa
 Alk a

Well #: 199-N-71
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:
100 NPL Agreement/Change Control Form No. 33, 9/23/92

Purpose for Monitoring Well:

Original: Assist in determination of groundwater contamination.

Current:

Recommendation for Consolidated Monitoring Program:
Discontinue monitoring this well.

Changes from current to proposed based on:
Purpose Fulfilled

Comments:

Current Analytical Class/Par

Frequency: Semiannual

ICP-M F

ICP-M U

Anions

H3

Sr-90

Gross B

Gross A

Gamma Scan

Sp Cond

pH

Turb

Temp

Proposed Analytical Class/Par

Frequency:

Well #: 199-N-71
Program: Ground-Water Surveillance

Responsible Contractor: PNNL
Contact: S. P. Luttrell
Phone: 376-6023

Monitoring Program Driver:

DOE Orders 5400.1, 5400.5; Atomic Energy Act Section 84; Washington State Law/rcw 70.98; Public Assurance; Natural Resource Damage Assessment

Purpose for Monitoring Well:

Original: Not sampled for this program.

Current: Background water chemistry.

Recommendation for Consolidated Monitoring Program:

Add well to program.

Changes from current to proposed based on:

Comments:

Other programs not analyzing tritium and Sr-90.

**Current Analytical Class/Par
Frequency:**

**Proposed Analytical Class/Par
Frequency: Annual
H3
Sr-90**

Well #: 199-N-72
Program: RCRA 1324

Responsible Contractor: WHC
Contact: Mary Hartman
Phone: 376-9924

Monitoring Program Driver:
40 CFR 265, Subpart F

Purpose for Monitoring Well:

Original: Downgradient compliance
Current: Same

Recommendation for Consolidated Monitoring Program:
Continue monitoring this well.

Changes from current to proposed based on:
Contaminant Trends
See comments

Comments:

Requirement for phenols should be waived because they have not been detected to date and are not contaminants of concern at this facility. Lead, gross alpha, and gross beta are only required during the first year under 40 CFR 265 and are not contaminants of concern at this facility.

(a) 1324-N/NA has been under assessment monitoring for TOX. Assessment program has achieved its goal and site will revert to indicator evaluation monitoring (semiannual sampling).

(b) Metals and anions only required annually under 40 CFR 265. Have been exceeding this requirement in the past.

Current Analytical Class/Par
Frequency: Quarterly
ICP-M F
Anions
Gross B
Gross A
Sp Cond
pH
TOC
TOX
Turb
Alk
TDS

Proposed Analytical Class/Par
Frequency: See analyte
ICP-M (F) a
Anions a
Sp Cond 4x sa
pH 4x sa
TOC 4x sa
TOX 4x sa
Turb sa
Alk a

Well #: 199-N-73
Program: RCRA 1324

Responsible Contractor: WHC
Contact: Mary Hartman
Phone: 376-9924

Monitoring Program Driver:
 40 CFR 265, Subpart F

Purpose for Monitoring Well:

Original: Downgradient compliance

Current: Same

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

Contaminant Trends

See comments

Comments:

Requirement for phenols should be waived because they have not been detected to date and are not contaminants of concern at this facility. Lead, gross alpha, and gross beta are only required during the first year under 40 CFR 265 and are not contaminants of concern at this facility.

(a) 1324-N/NA has been under assessment monitoring for TOX. Assessment program has achieved its goal and site will revert to indicator evaluation monitoring (semiannual sampling).

(b) Metals and anions only required annually under 40 CFR 265. Have been exceeding this requirement in the past.

Current Analytical Class/Par

Frequency: Quarterly

ICP-M F

Anions

Gross B

Gross A

Sp Cond

pH

TOC

TOX

Turb

Alk

TDS

Proposed Analytical Class/Par

Frequency: See analyte

ICP-M (F) a

Anions a

Sp Cond 4x sa

pH 4x sa

TOC 4x sa

TOX 4x sa

Turb sa

Alk a

Well #: 199-N-73
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:
100 NPL Agreement/Change Control Form No. 33, 9/23/92

Purpose for Monitoring Well:
Original: Assist in determination of groundwater contamination.
Current:

Recommendation for Consolidated Monitoring Program:
Discontinue monitoring this well.

Changes from current to proposed based on:
Purpose Fulfilled

Comments:

Current Analytical Class/Par
Frequency: Semiannual
ICP-M F
ICP-M U
Anions
H3
Sr-90
Gross B
Gross A
Gamma Scan
Sp Cond
pH
Turb
Temp

Proposed Analytical Class/Par
Frequency:

Well #: 199-N-74
Program: RCRA 1325

Responsible Contractor: WHC
Contact: Mary Hartman
Phone: 376-9924

Monitoring Program Driver:
40 CFR 265, Subpart F

Purpose for Monitoring Well:

Original: Upgradient well

Current: Same

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

Contaminant Trends

See comments

Comments:

Requirement for phenols should be waived because they have not been detected to date and are not contaminants of concern at this facility. Lead, gross alpha, and gross beta are only required during the first year under 40 CFR 265. Although lead may have been discharged to the facility, it has not been detected to date. Gross beta is better assessed by monitoring ⁹⁰Sr under other programs at this and/or nearby wells.

Metals and anions only required annually under 40 CFR 265. Have been exceeding this requirement in the past.

Current Analytical Class/Par

Frequency: See analyte

ICP-M F sa

Anions sa

Gross B sa

Gross A sa

Lead (F) sa

Phenols a

Sp Cond 4x sa

pH 4x sa

TOC 4x sa

TOX 4x sa

Turb sa

Alk sa

Proposed Analytical Class/Par

Frequency: See analyte

ICP-M (F) a

Anions a

Sp Cond 4x sa

pH 4x sa

TOC 4x sa

TOX 4x sa

Turb sa

Alk a

Well #: 199-N-74
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:
100 NPL Agreement/Change Control Form No. 33, 9/23/92

Purpose for Monitoring Well:

Original: Assist in determination of groundwater contamination.
Current: Same

Recommendation for Consolidated Monitoring Program:
Continue monitoring this well.

Changes from current to proposed based on:
Monitor groundwater upgradient of N-Area facilities.

Comments:

Current Analytical Class/Par

Frequency: Semiannual

ICP-M F
ICP-M U
Anions
H3
Sr-90
Gross B
Gross A
Gamma Scan
Sp Cond
pH
Turb
Temp
Turb
Temp

Proposed Analytical Class/Par

Frequency: Annual

Sp Cond
pH
Temp
Turb
ICP-M (F)
Gross Beta
Gamma Scan
alpha

Well #: 199-N-74
Program: Ground-Water Surveillance

Responsible Contractor: PNNL
Contact: S. P. Luttrell
Phone: 376-6023

Monitoring Program Driver:

DOE Orders 5400.1, 5400.5; Atomic Energy Act Section 84; Washington State Law/rcw 70.98;
Public Assurance; Natural Resource Damage Assessment

Purpose for Monitoring Well:

Original: Not sampled for this program.

Current: Define south edge of tritium and Sr-90 plumes.

Recommendation for Consolidated Monitoring Program:

Add well to program.

Changes from current to proposed based on:

Programmatic

Comments:

Other programs not analyzing tritium and Sr-90.

**Current Analytical Class/Par
Frequency:**

**Proposed Analytical Class/Par
Frequency: Annual
H3
Sr-90**

Well #: 199-N-75
Program: RCRA 1301

Responsible Contractor: WHC
Contact: Mary Hartman
Phone: 376-9924

Monitoring Program Driver:
40 CFR 265, Subpart F

Purpose for Monitoring Well:

Original: Downgradient compliance

Current: None

Recommendation for Consolidated Monitoring Program:

Discontinue monitoring this well.

Changes from current to proposed based on:

Flow Direction

Comments:

With extraction wells for pump-and-treat operating, well is no longer in the path of groundwater flowing beneath the facility.

Current Analytical Class/Par

Frequency: See analyte

ICP-M F sa

Anions sa

Gross B sa

Gross A sa

Lead (F) sa

Phenols a

Sp Cond 4x sa

pH 4x sa

TOC 4x sa

TOX 4x sa

Turb sa

Alk sa

Proposed Analytical Class/Par

Frequency: See analyte

Well #: 199-N-75
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

100 NPL Agreement/Change Control Form No. 33, 9/23/92

Purpose for Monitoring Well:

Original: Assist in determination of groundwater contamination.

Current: H3 plus Sr-90 plume near 1301-N, and track inorganic COPC's.

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

Contaminant Distribution

Comments:

Monitors contaminant of interest near this location.

Current Analytical Class/Par

Frequency: Semiannual

ICP-M F

ICP-M U

Anions

H3

Sr-90

Gross B

Gross A

Gamma Scan

Sp Cond

pH

Turb

Temp

Proposed Analytical Class/Par

Frequency: Semiannual

ICP-M (F)

Anions

H3

Sr-90

Gross Beta

Sp Cond

pH

Turb

Temp

Well #: 199-N-75
Program: ERA Performance Monitoring

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

Result of DQO workshop between DOE, Ecology and EPA.

Purpose for Monitoring Well:

Original:

Current: Assess the impacts of the N-Spring ERA Pump and Treat on the aquifer.

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well according to Performance Monitoring Plan.

Changes from current to proposed based on:

Comments:

Current Analytical Class/Par

Frequency: Monthly

Sr-90

pH

Temp

Cond

Eh

Ca, Mg, SO4

Proposed Analytical Class/Par

Frequency: Semiannual

Sr-90

pH

Temp

Cond

Eh

Ca, Mg, SO4

Well #: 199-N-76
Program: RCRA 1301

Responsible Contractor: WHC
Contact: Mary Hartman
Phone: 376-9924

Monitoring Program Driver:
40 CFR 265, Subpart F

Purpose for Monitoring Well:

Original: Downgradient compliance
Current: None

Recommendation for Consolidated Monitoring Program:
Discontinue monitoring this well.

Changes from current to proposed based on:
Flow Direction

Comments:

With extraction wells for pump-and-treat operating, well is no longer in the path of groundwater flowing beneath the facility.

Current Analytical Class/Par

Frequency: See analyte

ICP-M F sa
Anions sa
Gross B sa
Gross A sa
Lead (F) sa
Phenols a
Sp Cond 4x sa
pH 4x sa
TOC 4x sa
TOX 4x sa
Turb sa
Alk sa

Proposed Analytical Class/Par

Frequency: See analyte

Well #: 199-N-76
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

100 NPL Agreement/Change Control Form No. 33, 9/23/92

Purpose for Monitoring Well:

Original: Assist in determination of groundwater contamination.

Current: Sr-90 plus H3 plumes near 1301-N, and track inorganic COPC's.

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

Contaminant Distribution

Comments on Changes:

Monitors contaminant of interest near this location.

Current Analytical Class/Par

Frequency: Semiannual

ICP-M F
ICP-M U
Anions
H3
Sr-90
Gross B
Gross A
Gamma Scan
Sp Cond
pH
Turb
Temp

Proposed Analytical Class/Par

Frequency: Semiannual

ICP-M (F)
Anions
H3
Sr-90
Gross Beta
Sp Cond
pH
Turb
Temp
Gamma Scan

Well #: 199-N-76
Program: ERA Performance Monitoring

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

Result of DQO workshop between DOE, Ecology and EPA.

Purpose for Monitoring Well:

Original:

Current: Assess the impacts of the N-Spring ERA Pump and Treat on the aquifer.

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well according to Performance Monitoring Plan.

Changes from current to proposed based on:

Comments:

* = Sampling frequency may be adjusted to semi-annual

Current Analytical Class/Par

Frequency: Monthly

Sr-90

pH

Temp

Cond

Eh

Ca, Mg, SO₄

Proposed Analytical Class/Par

Frequency: Monthly *

Sr-90

pH

Temp

Cond

Eh

Ca, Mg, SO₄

Well #: 199-N-76
Program: Ground-Water Surveillance

Responsible Contractor: PNNL
Contact: S. P. Luttrell
Phone: 376-6023

Monitoring Program Driver:

DOE Orders 5400.1, 5400.5; Atomic Energy Act Section 84; Washington State Law/rcw 70.98; Public Assurance; Natural Resource Damage Assessment

Purpose for Monitoring Well:

Original: Define Sr-90 plume above the DCG; evaluate presence/absence of numerous radionuclides; evaluate sorbed Sr-90.

Current: Define Sr-90 plume above the DCG.

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

Programmatic

Comments:

Current Analytical Class/Par

Frequency: Annual

VOC

ICP-M F

ICP-M U

Anions

H3

Sr-90

Sr-90 F

Gross B

Gross A

Gamma Scan

I-129

Tc-99

Turb

Proposed Analytical Class/Par

Frequency: Annual

Sr-90

Gross Alpha

Gamma Scan

Well #: 199-N-77
Program: RCRA 1324

Responsible Contractor: WHC
Contact: Mary Hartman
Phone: 376-9924

Monitoring Program Driver:
 40 CFR 265, Subpart F

Purpose for Monitoring Well:

Original: Characterization
Current: Same

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

See comments

Comments:

Gross alpha, gross beta, and lead are only required during the first year under 40 CFR 265. Requirements for phenols should be waived because they have not been detected to date and are not contaminants of concern at this facility.

Current Analytical Class/Par

Frequency: Quarterly

ICP-M F

Anions

Gross B

Gross A

Lead (F)

Phenols

Sp Cond

pH

TOC

TOX

Turb

Alk

Proposed Analytical Class/Par

Frequency: See analyte

Sp Cond sa

pH sa

Turb sa

Alk a

Anions a

ICP-M (F) a

TOX sa

TOC sa

alpha a

Well #: 199-N-77
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

100 NPL Agreement/Change Control Form No. 33, 9/23/92

Purpose for Monitoring Well:

Original: Assist in determination of groundwater contamination.

Current:

Recommendation for Consolidated Monitoring Program:

Discontinue monitoring this well.

Changes from current to proposed based on:

Purpose Fulfilled

Comments:

Current Analytical Class/Par

Frequency: Semiannual

ICP-M F

ICP-M U

Anions

H3

Sr-90

Gross B

Gross A

Gamma Scan

Sp Cond

pH

Turb

Temp

Proposed Analytical Class/Par

Frequency:

Well #: 199-N-80
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

100 NPL Agreement/Change Control Form No. 33, 9/23/92

Purpose for Monitoring Well:

Original: Assist in determination of groundwater contamination.

Current: Same

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

Monitor groundwater in the lower unconfined aquifer.

Comments:

Current Analytical Class/Par

Frequency: Semiannual

ICP-M F
 ICP-M U
 Anions
 H3
 Sr-90
 Gross B
 Gross A
 Gamma Scan
 Sp Cond
 pH
 Turb
 Temp

Proposed Analytical Class/Par

Frequency: Annual

Sp Cond
 pH
 Temp
 Turb
 Anions
 ICP-M (F)
 Gross beta
 Gamma Scan
 Sr-90
 H3
 alpha

Well #: 199-N-80
Program: Ground-Water Surveillance

Responsible Contractor: PNNL
Contact: S. P. Luttrell
Phone: 376-6023

Monitoring Program Driver:

DOE Orders 5400.1, 5400.5; Atomic Energy Act Section 84; Washington State Law/rcw 70.98; Public Assurance; Natural Resource Damage Assessment

Purpose for Monitoring Well:

Original: Monitor several constituents deep in the aquifer.

Current: Monitor Sr-90 and tritium at depth.

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

Purpose Fulfilled

Comments:

No longer need to evaluate other constituents.

Current Analytical Class/Par

Frequency: Annual

VOC

ICP-M F

Anions

H3

Sr-90

Gamma Scan

TOC

Turb

Proposed Analytical Class/Par

Frequency: Annual

H3

Sr-90

Well #: 199-N-81
Program: RCRA 1325

Responsible Contractor: WHC
Contact: Mary Hartman
Phone: 376-9924

Monitoring Program Driver:
 40 CFR 265, Subpart F

Purpose for Monitoring Well:

Original: Downgradient compliance
Current: Same

Recommendation for Consolidated Monitoring Program:
 Continue monitoring this well.

Changes from current to proposed based on:
 Contaminant Trends
 See comments

Comments:

Requirement for phenols should be waived because they have not been detected to date and are not contaminants of concern at this facility. Lead, gross alpha, and gross beta are only required during the first year under 40 CFR 265. Although lead may have been discharged to the facility, it has not been detected to date. Gross beta is better assessed by monitoring ⁹⁰Sr under other programs at this and/or nearby wells.

Metals and anions only required annually under 40 CFR 265. Have been exceeding this requirement in the past.

Current Analytical Class/Par

Frequency: See analyte

ICP-M F sa
 Anions sa
 Gross B sa
 Gross A sa
 Lead (F) sa
 Phenols a
 Sp Cond 4x sa
 pH 4x sa
 TOC 4x sa
 TOX 4x sa
 Turb sa
 Alk sa

Proposed Analytical Class/Par

Frequency: See analyte

ICP-M (F) a
 Anions a
 Sp Cond 4x sa
 pH 4x sa
 TOC 4x sa
 TOX 4x sa
 Turb sa
 Alk a

Well #: 199-N-81
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

Purpose for Monitoring Well:

Original:

Current: Sr-90 and H3 plume near 1301-N, and track inorganic COPC's.

Recommendation for Consolidated Monitoring Program:

Add well to program.

Changes from current to proposed based on:

Contaminant Distribution

Comments:

Monitors contaminants of interest near this location.

**Current Analytical Class/Par
Frequency:**

**Proposed Analytical Class/Par
Frequency: Annual**

ICP-M (F)

Anions

H3

Sr-90

Gross Beta

Sp Cond

pH

Turb

Temp

Well #: 199-N-81
Program: Ground-Water Surveillance

Responsible Contractor: PNNL
Contact: S. P. Luttrell
Phone: 376-6023

Monitoring Program Driver:

DOE Orders 5400.1, 5400.5; Atomic Energy Act Section 84; Washington State Law/rcw 70.98; Public Assurance; Natural Resource Damage Assessment

Purpose for Monitoring Well:

Original: Monitor to define the northeast edge of the Sr-90 plume; define the tritium plume.

Current: Monitor to define Sr-90.

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well.

Changes from current to proposed based on:

Purpose Fulfilled

Comments:

No longer need to evaluate other constituents. Other wells can be used to define tritium plume.

Current Analytical Class/Par

Frequency: Annual

VOC

H3

Sr-90

Gamma Scan

Total Carbon

TOC

Turb

Proposed Analytical Class/Par

Frequency: Annual

Sr-90

Well #: 199-N-92A
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

Purpose for Monitoring Well:

Original:

Current: Monitor Sr-90, H3 and COPC's near river.

Recommendation for Consolidated Monitoring Program:

Add well to program.

Changes from current to proposed based on:

Comments:

**Current Analytical Class/Par
Frequency:**

**Proposed Analytical Class/Par
Frequency: Annual**
ICP-M (F)
Anions
H3
Sr-90
Gross Beta
Sp Cond
pH
Turb
Temp

Well #: 199-N-92A
Program: ERA Performance Monitoring

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

Result of DQO workshop between DOE, Ecology and EPA.

Purpose for Monitoring Well:

Original:

Current: Assess the impacts of the N-Spring ERA Pump and Treat on the aquifer.

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well according to Performance Monitoring Plan.

Changes from current to proposed based on:

Comments:

Current Analytical Class/Par

Frequency: Monthly

Sr-90

pH

Temp

Cond

Eh

Proposed Analytical Class/Par

Frequency: Semiannual

Sr-90

pH

Temp

Cond

Eh

Well #: 199-N-96A
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

Purpose for Monitoring Well:

Original:

Current: Monitor Sr-90, H3 and COPC's near river.

Recommendation for Consolidated Monitoring Program:

Add well to program.

Changes from current to proposed based on:

Comments:

**Current Analytical Class/Par
Frequency:**

**Proposed Analytical Class/Par
Frequency: Annual**
ICP-M (F)
Anions
H3
Sr-90
Gross Beta
Sp Cond
pH
Turb
Temp

Well #: 199-N-96A
Program: ERA Performance Monitoring

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

Result of DQO workshop between DOE, Ecology and EPA.

Purpose for Monitoring Well:

Original:

Current: Assess the impacts of the N-Spring ERA Pump and Treat on the aquifer.

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well according to Performance Monitoring Plan.

Changes from current to proposed based on:

Comments:

Current Analytical Class/Par

Frequency: Monthly

Sr-90

pH

Temp

Cond

Eh

TPH

Proposed Analytical Class/Par

Frequency: Semiannual

Sr-90

pH

Temp

Cond

Eh

TPH

Well #: 199-N-99A
Program: CERCLA NR-2

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

Purpose for Monitoring Well:

Original:

Current: Monitor Sr-90, H3 and COPC's near river.

Recommendation for Consolidated Monitoring Program:

Add well to program.

Changes from current to proposed based on:

Comments on Changes:

**Current Analytical Class/Par
Frequency:**

**Proposed Analytical Class/Par
Frequency: Annual**

ICP-M (F)

Anions

H3

Sr-90

Gross Beta

Sp Cond

pH

Turb

Temp

Well #: 199-N-103A
Program: ERA Performance Monitoring

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

Result of DQO workshop between DOE, Ecology and EPA.

Purpose for Monitoring Well:

Original:

Current: Assess the impacts of the N-Spring ERA Pump and Treat on the aquifer.

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well according to Performance Monitoring Plan.

Changes from current to proposed based on:

Comments:

Current Analytical Class/Par

Frequency: Monthly

Sr-90

pH

Temp

Cond

Eh

Ca, Mg, SO₄

TPH

Proposed Analytical Class/Par

Frequency: Semiannual

Sr-90

pH

Temp

Cond

Eh

Ca, Mg, SO₄

TPH

Well #: 199-N-105A
Program: RCRA 1301

Responsible Contractor: WHC
Contact: Mary Hartman
Phone: 376-9924

Monitoring Program Driver:
40 CFR 265, Subpart F

Purpose for Monitoring Well:

Original: Not in network
Current: Downgradient compliance

Recommendation for Consolidated Monitoring Program:
Continue monitoring this well.

Changes from current to proposed based on:
Flow Direction

Comments:

This is the closest pumping well to the 1301-N trench, and will pull in groundwater flow from a large portion of the trench. It will replace downgradient wells N-75, N-76, and N-14.

Current Analytical Class/Par
Frequency: See analyte

Proposed Analytical Class/Par
Frequency: See analyte
ICP-M (F) a
Anions a
Sp Cond 4x sa
pH 4x sa
TCC 4x sa
TOX 4x sa
Turb sa
Alk a

Well #: 199-N-105A
Program: ERA Performance Monitoring

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

Result of DQO workshop between DOE, Ecology and EPA.

Purpose for Monitoring Well:

Original:

Current: Assess the impacts of the N-Spring ERA Pump and Treat on the aquifer.

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well according to Performance Monitoring Plan.

Changes from current to proposed based on:

Comments:

Current Analytical Class/Par

Frequency: Monthly

Sr-90

pH

Temp

Cond

Eh

Ca, Mg, SO4

Proposed Analytical Class/Par

Frequency: Semiannual

Sr-90

pH

Temp

Cond

Eh

Ca, Mg, SO4

Well #: 199-N-106A
Program: ERA Performance Monitoring

Responsible Contractor: ERC
Contact: J. V. Borghese
Phone: 373-4790

Monitoring Program Driver:

Result of DQO workshop between DOE, Ecology and EPA.

Purpose for Monitoring Well:

Original:

Current: Assess the impacts of the N-Spring ERA Pump and Treat on the aquifer.

Recommendation for Consolidated Monitoring Program:

Continue monitoring this well according to Performance Monitoring Plan.

Changes from current to proposed based on:

Comments:

Current Analytical Class/Par

Frequency: Monthly

Sr-90

pH

Temp

Cond

Eh

Ca, Mg, SO₄

Proposed Analytical Class/Par

Frequency: Semiannual

Sr-90

pH

Temp

Cond

Eh

Ca, Mg, SO₄

Well #: N Springs Seep Wells
Program: Near Field Monitoring

Responsible Contractor: ERC
Contact: C. J. Perkins
Phone: 373-4560

Monitoring Program Driver:

N-Springs (Seep): DOE Order 5820.2A, 5400.1, 5400.5, 5484.1 and DOE/EH-0173T

Purpose for Monitoring Well:

Original: Shoreline characterization...annual sampling frequency.

Current: Same

Recommendation for Consolidated Monitoring Program:

Continue to monitor this well.

Changes from current to proposed based on:

Comments:

No changes.

Current Analytical Class/Par

Frequency: Annual

H3

Sr-90

Gamma Scan

Proposed Analytical Class/Par

Frequency: Annual

H3

Sr-90

Gamma Scan

APPENDIX C

Proposed Consolidated Program: Subprogram Well Location Maps

IONALLY

ALB

**THIS PAGE INTENTIONALLY
LEFT BLANK**

FIGURES

C-1. RCRA Subprogram Well Location Map C-1
C-2. 100-NR-2 Subprogram Well Location Map C-3
C-3. Performance Monitoring Subprogram Well Location Map C-5
C-4. Surveillance Subprogram Well Location Map C-7
C-5. Near Field Monitoring Subprogram Well Location Map C-9
C-6. Liquid Effluent Subprogram Well Location Map C-11
C-7. NPDES Subprogram Well Location Map C-13

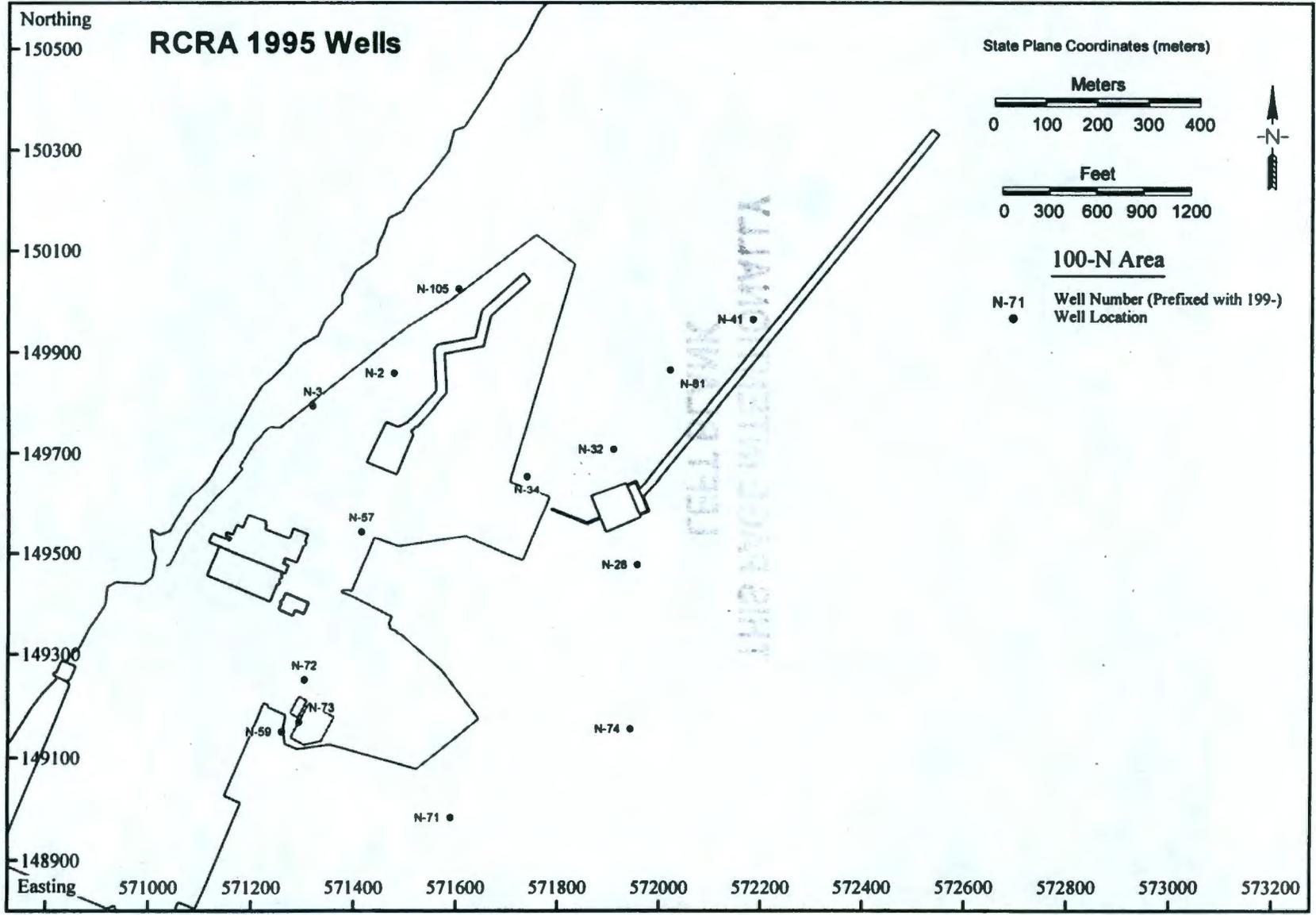
YJ/A

**THIS PAGE INTENTIONALLY
LEFT BLANK**

9713541.0593

BHI-00725
Rev. 0

Figure C-1. RCRA Subprogram Well Location Map.



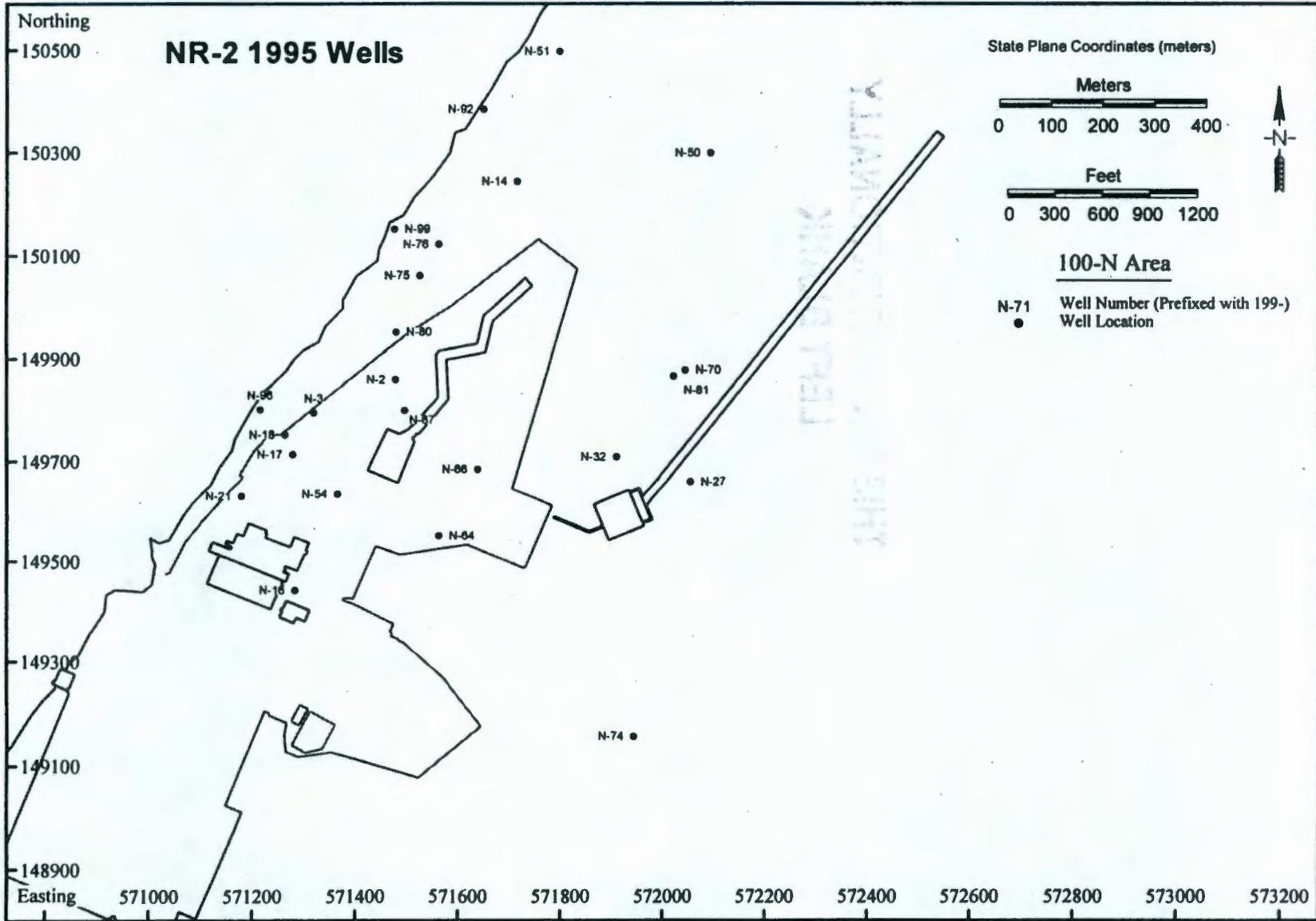
C-1

**THIS PAGE INTENTIONALLY
LEFT BLANK**

9713541.0594

BHI-00725
Rev. 0

Figure C-2. 100-NR-2 Subprogram Well Location Map.



C-3

**THIS PAGE INTENTIONALLY
LEFT BLANK**

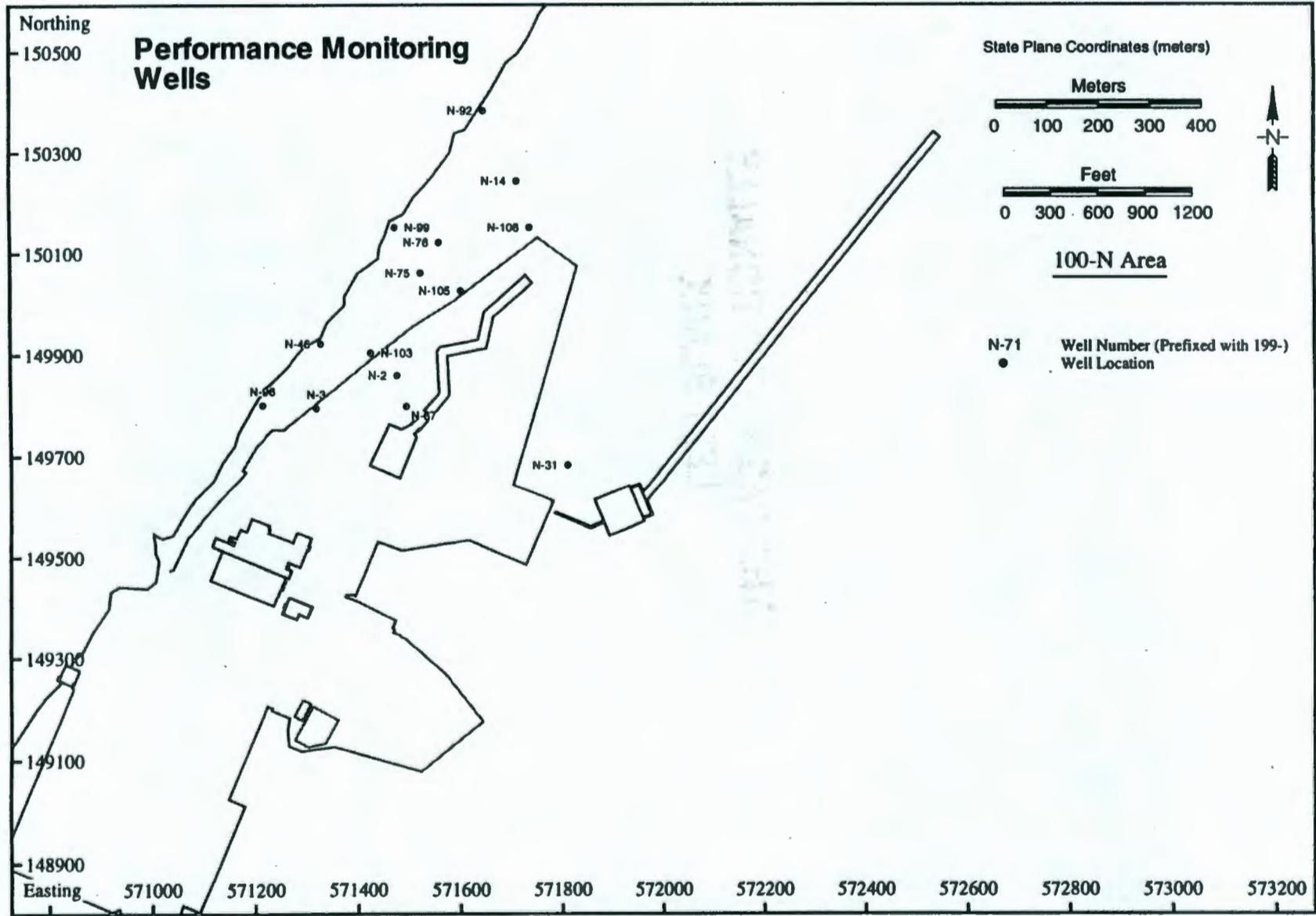


Figure C-3. Performance Monitoring Subprogram Well Location Map.

C-5

**THIS PAGE INTENTIONALLY
LEFT BLANK**

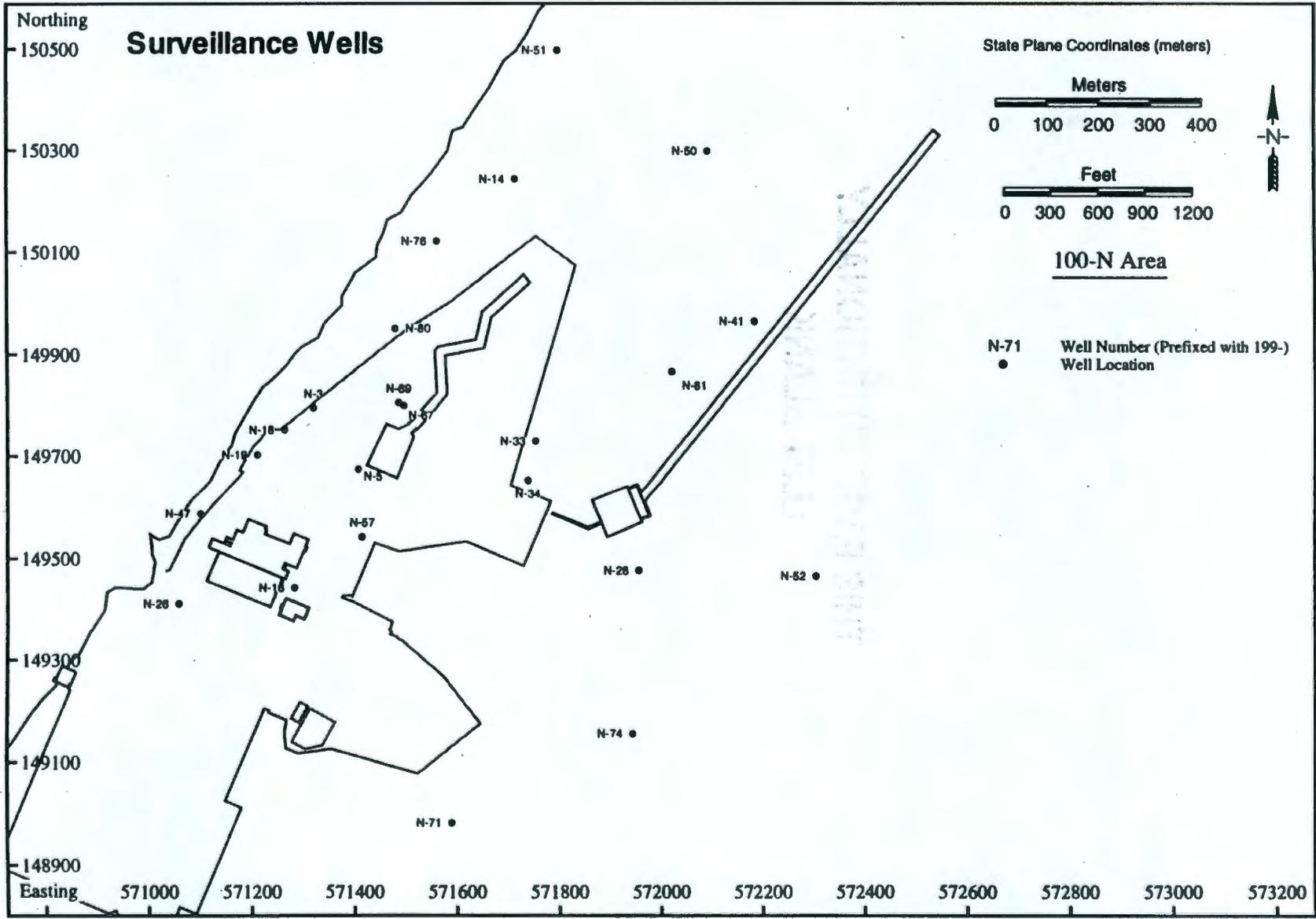


Figure C-4. Surveillance Subprogram Well Location Map.

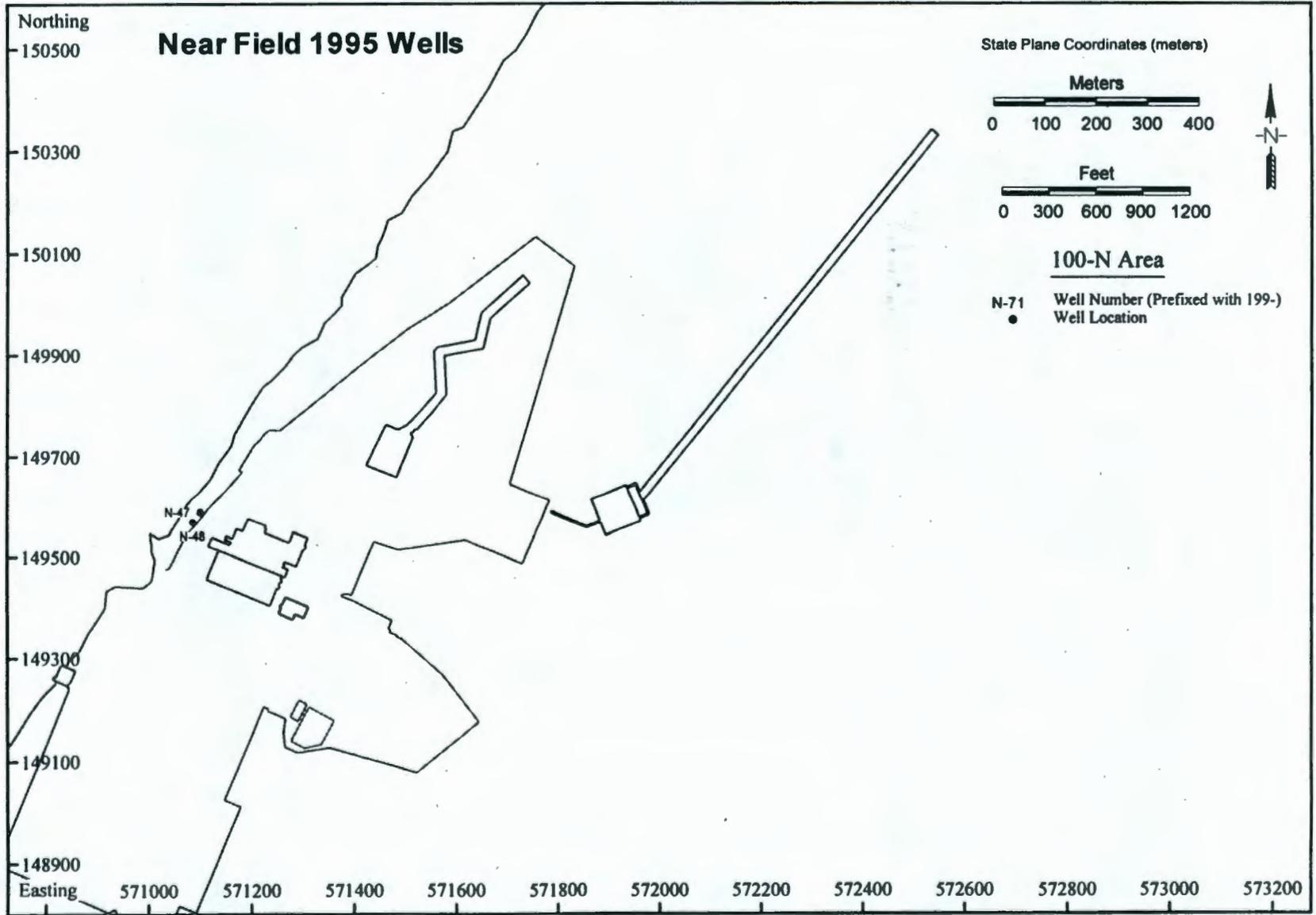
C-7

**THIS PAGE INTENTIONALLY
LEFT BLANK**

9713541.0597

BHI-00725
Rev. 0

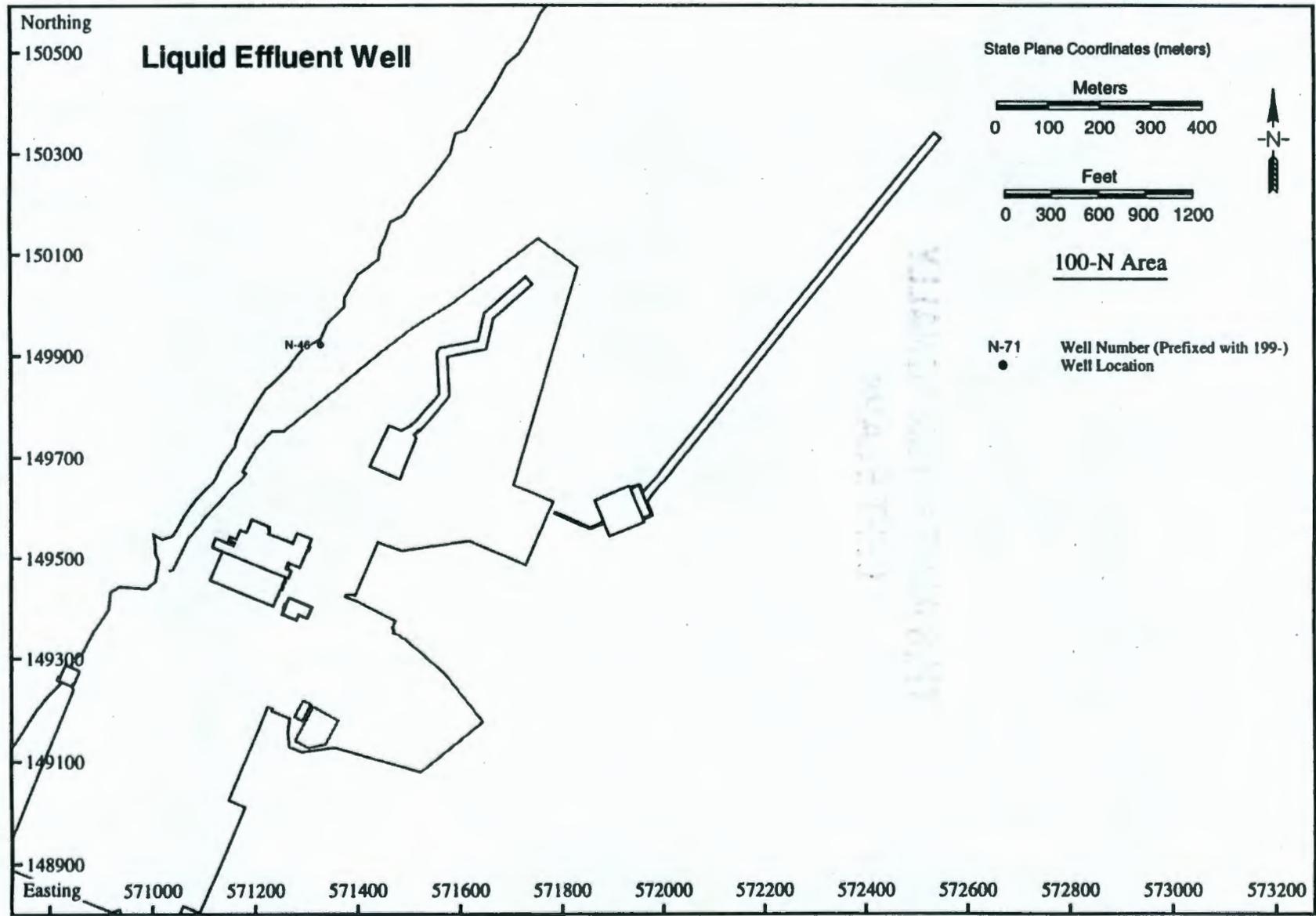
Figure C-5. Near Field Monitoring Subprogram Well Location Map.



C-9

**THIS PAGE INTENTIONALLY
LEFT BLANK**

Figure C-6. Liquid Effluent Subprogram Well Location Map.



C-11

**THIS PAGE INTENTIONALLY
LEFT BLANK**

C-13

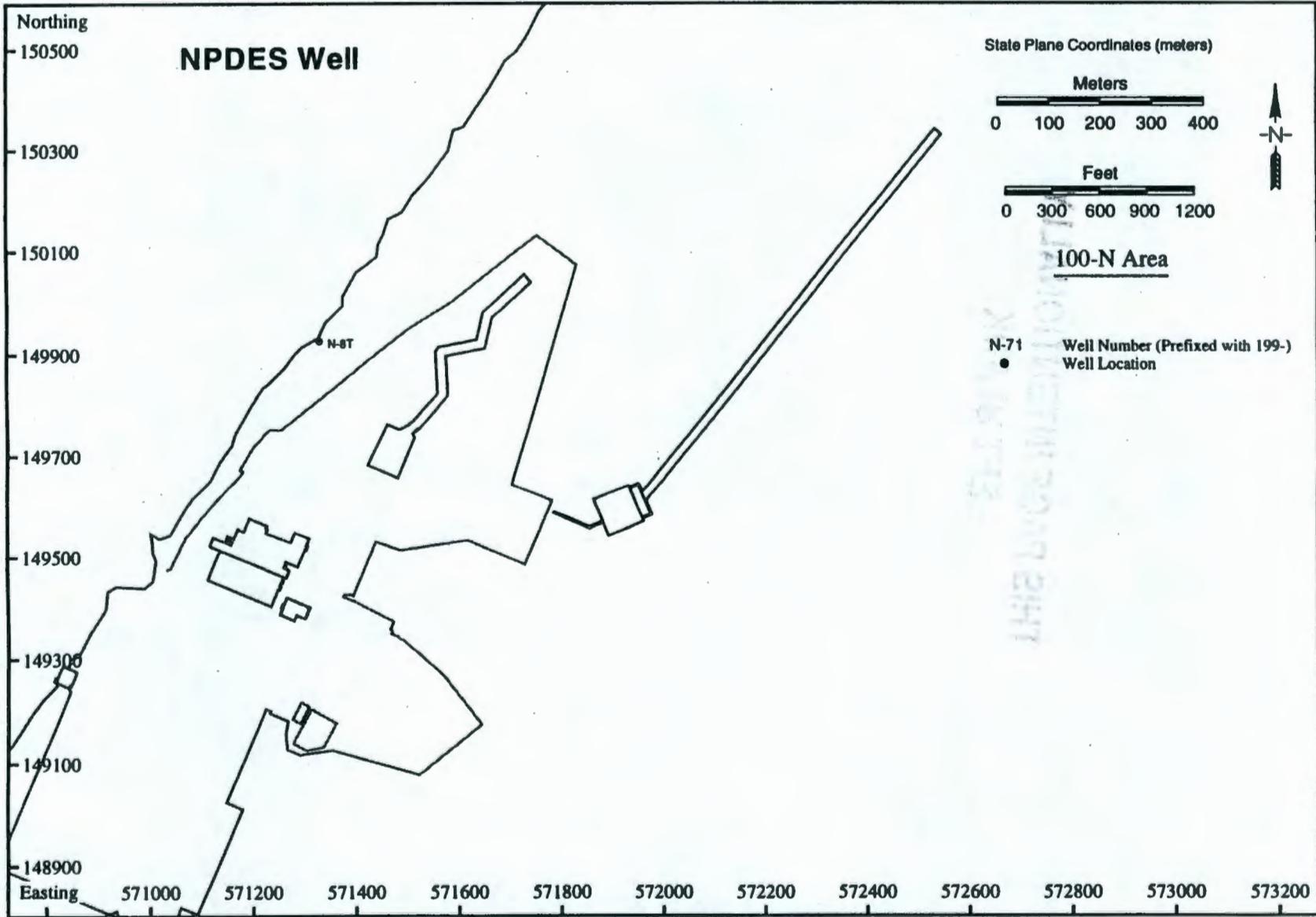


Figure C-7. NPDES Subprogram Well Location Map.

**THIS PAGE INTENTIONALLY
LEFT BLANK**

DISTRIBUTION

Onsite (25 copies)

**U.S. Department of Energy
Richland Operations Office**

M.J. Furman	H0-12
D.E. Olson	H0-12
P.M. Pak	H0-12

ERC Team

J.V. Borghese (5)	H9-03
B.H. Ford	H0-02
M.J. Hartman	K6-96
M. Lauterbach	X5-54
S.P. Luttrell	K6-96
B. Mukherjee	X5-54
C.J. Perkins	S3-24
E.F. Shorey	H9-03
M.H. Sturges	H4-79
L.C. Swanson	H4-11
S.C. Tindall	H0-02
W.S. Thompson	N1-28
S.J. Trent	X0-37
J.P. Zoric	X5-57
BHI Document Control (3)	H0-09
Environmental Resource Center	H6-07

**THIS PAGE INTENTIONALLY
LEFT BLANK**