

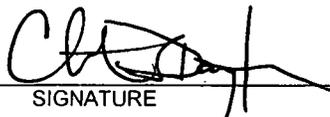
Fiscal Year 2005

Well Abandonment and Replacement Program

Work Plan Addendum

February 2005

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1.0 INTRODUCTION

This Well Abandonment and Replacement Program (WARP) Work Plan Addendum (WPA) is an attachment to the WARP Work Plan (WP) issued in 2002 (document number WARP-0206-WP). This WPA describes WARP activities to be performed in fiscal year 2005 (FY05). These activities will be conducted in the Buffer Zone (BZ) and the Industrial Area (IA) of the Rocky Flats Environmental Technology Site (RFETS or Site).

The intended overall scope and schedule of this WPA is to eliminate all non-IMP wells and to replace those IMP wells requiring replacement. This scope will be completed by the end of FY05 (i.e., by September 30, 2005). Therefore, upon completion of the scope described in this WPA, the only monitoring wells that will remain at the Site will be those that are identified in the FY05 Integrated Monitoring Plan (IMP).

This WPA identifies 276 wells/well points/piezometers (collectively termed "wells" in this document) to be abandoned, including 26 wells that will be abandoned and replaced. Installation of these replacement wells is also addressed in this WPA.

It is anticipated that minor changes to the FY05 WARP scope may be necessary. For example, after this WPA is issued, the FY05 IMP may be revised to include wells identified in this WPA for abandonment, or to eliminate wells previously scheduled to remain at Site closure. It may also be necessary to replace additional wells, for example as a result of damage related to activities conducted as part of Site closure or to monitor the performance of a remedial action. Such minor changes would normally require the development and issuance of revisions to this WPA. To provide a more timely and efficient response, given the schedule requirements discussed in this WPA, an alternative method is allowed:

If additional wells need to be abandoned and/or replaced, that work may be performed without formal modification and regeneration of this WPA and without generation of a new WPA. In such cases, this WPA shall either be adjusted via pen-and-ink changes by the WARP Project Manager or designee, or via written instructions (which may be in email form) issued by the WARP Project Manager or designee. Pen-and-ink changes shall be made to each distributed copy of this WPA in the format specified in PRO-1457-UL, Use of Logbooks, and a written summary of these changes shall be provided to RFETS Document Control so that they may be attached to copies of this WPA maintained by that organization. Similarly, written instructions shall be disseminated to each individual on the Distribution List for this WPA and shall then be attached to this WPA, and a summary shall be provided to Document Control. However, if the additional work entails the installation of one or more new monitoring locations (as opposed to replacing existing wells), a new WP or WPA shall be constructed to address this work.

1.1 Organization of this WPA

Section 1 of this WPA introduces the work to be performed and presents a summary of general requirements. Section 2 describes the group of BZ wells that will be abandoned. Section 3 presents IA well abandonments. Section 4 defines pre-abandonment sampling requirements for all proposed abandonments. Section 5 discusses well replacements; for convenience, because the original wells must be abandoned, they are also identified in either Section 2 or 3. Section 6 summarizes miscellaneous WARP activities. Section 7 describes coordination with other projects and summarizes the schedule, organization, waste handling requirements, and other administrative issues. Coordination with other groups and scheduling abandonments and installations will be especially important in order to ensure worker safety, to maintain a high-quality work product (properly abandoned and installed monitoring wells), and to maximize work efficiency.

1.2 General Requirements

A good-faith effort shall be made to locate every well scheduled for abandonment, and these efforts shall be documented in the field logbook. If a well cannot be found, it will be assumed that the well has been previously abandoned.

All components of every well abandoned as a part of this WPA, including bollards (bumper-posts), PVC, steel, and concrete pads, shall be removed to a depth no shallower than three feet (3 ft.) below final ground

surface, as practicable. The final ground surface is defined by the Conceptual Site Grading Plan, Version 12 (V. 12; herein referred to as "final grade"), which includes land configuration and conceptual grading drawings of the planned ground surface at Site closure. The elevation of the final grade at a given well may be above or below the ground surface that is present at the time the well is abandoned. As a result, the depth to which well components shall be physically removed may vary from 3 ft. below final grade. For example, if the ground surface is to be lowered 2 ft. to reach final grade, it will be necessary to remove well components to no shallower than 5 ft. below the current ground surface to ensure that remaining components are at least 3 ft. below final grade. Note that planned changes to the ground surface elevation can affect the depths to which materials are placed when filling a well, because the uppermost 5 ft. of the remaining well casing – possibly including a portion of the screened interval – must be filled with bentonite. This applies similarly to a borehole from which a well is completely removed, because the uppermost 5 ft. of the borehole – also measured using the final grade – must be filled with bentonite.

Changes to the current ground surface elevation to reach final grade are incorporated in the well abandonment tables in this WPA. This will allow field personnel to quickly determine the depth to which well components must be removed. If the Conceptual Site Grading Plan is revised beyond V. 12, and the revisions result in changes to the depth to which well components are to be removed, these changes shall be incorporated in any remaining WARP activities to the extent that this is feasible. It will not be necessary to return to any previously-abandoned location in an attempt to remove additional portions of remaining well components.

Activities to be conducted within approximately 300 ft. of a stream or intermittent drainage are potentially within or adjacent to Prebles Meadow Jumping Mouse habitat and/or wetlands. WARP activities in such areas shall be discussed in advance with Kaiser-Hill (K-H) Ecology personnel to determine any travel, work, or scheduling restrictions.

A water-level measurement will be collected by the well abandonment crew immediately prior to abandoning that well (regardless of whether the water level was measured recently at that location). Where feasible, the pre-abandonment sample data should be reviewed before abandonment begins. Special equipment may be necessary to collect the required water-level data from small-diameter wells.

Prior to abandoning a well, several other activities may need to be performed. Any required pre-abandonment sampling of that well shall be performed as identified in Section 4. Where feasible, the resulting data should also be reviewed before abandonment begins.

If a well to be abandoned is equipped with a dedicated pump, that pump and the associated tubing and fittings shall be removed and disposed as non-routine sanitary waste or as otherwise directed by Radiological Engineering and the Waste Subject Matter Expert (SME) prior to abandonment. See Section 7 for additional discussion.

If a well to be abandoned is equipped with a down-hole water level transducer and data logger, that equipment shall be removed from the well. This equipment shall be gently decontaminated. Aggressive scrubbing with abrasives should not be performed on the connections and the area around the transducer port. The entire downhole portion of the unit should be thoroughly rinsed with distilled or deionized water, with special attention paid to that portion of the equipment that has been submerged. Dilute soapy solution may be used, so long as it is thoroughly rinsed off the equipment. If present, discoloration should be removed but care shall be taken to avoid damaging the equipment. Following decontamination and thorough rinsing, the equipment shall be carefully dried and stored in a clean plastic bag for later deployment in a closure monitoring well. Activities associated with this equipment should be coordinated with the Water Programs Sampling Liaison, and any questions regarding decontamination of the units shall be directed to that individual.

Several IMP wells are scheduled to be abandoned and replaced, and they are identified in this WPA. Approval to abandon any IMP well must be obtained from the WARP Project Manager before abandonment activities begin. Abandonment of the other wells will not result in any adverse effects on the Site's groundwater monitoring network. If a groundwater monitoring location is added to the IMP after a well previously at that location has been abandoned, a replacement well will be installed.

All wells identified in this WPA shall be abandoned in place or through casing removal. The preferred method will be abandonment in place, unless the well construction or the depth to which a well must be removed are such that casing removal is easier or more efficient. The main criteria to consider in such cases include the total depth of the well, the diameter and material of the well components, and the final grade. If a well is very shallow (for example, less than 10 ft.), it may be easier to remove the entire well assembly than to abandon it in place. Similarly, if a well is constructed of small-diameter (generally, 1 inch or less) or stainless steel casing and is no deeper than about 15 ft., it may be easier to remove the casing than to abandon it in place. Finally, if the final grade is such that most of the well must be removed to meet the 3-ft.-below-final-grade requirement, it may be simpler to remove the entire well. As long as the abandonment is completed safely and in accordance with State and closure contract requirements, the actual method used will be at the discretion of the field crew.

Personnel engaging in WARP activities shall comply with the WARP Work Plan (WARP-0206-WP) and the Water Monitoring and Compliance Program Health and Safety Plan (HASP), as well as other Site and task-specific procedures and requirements that apply (in particular, Abandonment of Wells and Boreholes, PRO-1620-AWB; OPS-PRO.114, Drilling and Sampling Using Hollow Stem Auger and Rotary Drilling and Rock Coring Techniques; RMRS/OPS-PRO.124, Push Subsurface Soil Sampling; PRO-1059-WELL-118, Monitoring Well Installation; and the various Standard Operating Procedures [SOPs] addressing documentation, logging, decontamination, etc. referenced therein). The appropriate notifications and authorizations (for example, approved Soil Disturbance Permit[s] and Environmental Checklist[s]) shall be obtained prior to beginning fieldwork in a specific area, as discussed in the WARP Work Plan. Special attention shall be paid to travel in sensitive areas (e.g., Prebles Meadow Jumping Mouse habitat and other areas of the BZ, as well as graded and seeded areas of the IA) to minimize disturbance.

Coordination with other groups, such as Environmental Restoration (ER) or various facility demolition projects, will be necessary in many areas to ensure personnel safety, efficient performance of required activities, and to minimize potential impacts on other projects. In many cases within the IA, it may be possible to obtain support from an ongoing project to abandon wells (for example, by removing surface protection and disposing of the waste). Such efficiencies will be employed as appropriate and feasible.

Where specific, schedule-coordination requirements are known, they are stated in Section 7. However, it is anticipated that schedule changes, most often to accelerate abandonments, will be required as other projects work toward completion. Similarly, installation of well replacements may need to be accelerated or delayed to respond to the schedules of closure activities conducted in the target locations (e.g., to precede final seeding and installation of erosion controls, or to follow facility removal and grading).

It is anticipated that the focus during the early part of the year will be on abandoning wells in the IA, to get them out of the way of closure projects and grading activities. As a result, the later part of the year will focus on abandonments in the BZ. Installation of replacement wells will be scheduled around other activities and outside influences (such as those noted above).

While performing the activities described in this WPA, worker safety and quality of work product are of primary importance. As noted above, safety is addressed in the HASP. Quality is addressed in the Water Monitoring and Compliance Program Quality Assurance Project Plan. Quality is also addressed in the WARP Work Plan and supporting documents, including the SOPs referenced therein. Tools, materials, and supplies used for the project shall be new and/or freshly decontaminated, as appropriate, in accordance with the pertinent SOPs and good work practices.

2.0 BUFFER ZONE WELL ABANDONMENTS

A total of 113 wells are scheduled to be abandoned in the BZ through this WPA, including 3 well abandonments/replacements. They are displayed on Figure 1 and listed in Table 2-1. Additional abandonments and replacements in the BZ may be noted in attachments to this WPA, and canceled abandonments may be noted by having the WARP Project Manager properly strike through, initial, and date the well entry in the table.

Table 2-1 also provides information on the final grade, which shall be used to determine the depth to which well components shall be removed. If additional revisions to this final grade are issued, any changes shall be noted in this table as soon as they are available. Section 2.1 provides special considerations that apply to some of these wells before they can be abandoned. Section 7 provides schedule information.

Not included in Table 2-1 are wells that were scheduled for abandonment in 2004 in the Original Landfill, but which still exist at the request of that closure project. These wells will be abandoned in 2005, with the Original Landfill project performing most of the associated labor. See Section 7 for additional discussion.

Wells to be abandoned within the BZ (Table 2-1) are listed in numeric order. References to final grade are in comparison to current elevations. Negative values indicate that the final ground surface will be lower than the current ground surface (i.e., a cut will take place); positive values indicate the final ground surface will be higher (i.e., fill will be added).

Table 2-1 FY05 Buffer Zone Well Abandonments

Well	Map Grid		Casing TD (ft. bgs)	Casing ID (in.)	Casing Material	Top of Screen (ft. bgs)	Location: Reason for Abandonment	Final Grade (With Respect to Current Grade); (ft.)
	E-W	N-S						
00193*	P	7	22.2	4	PVC	10	Inlet to Pond C-2; data objectives satisfied	NC
00293	G	10	50	2	PVC	38	Westernmost N. Walnut Creek drainage; data objectives satisfied	NC
00891	O	8	19.9	2	PVC	7.9	903 Hillside; data objectives satisfied	NC
01291	O	8	15.3	2	PVC	5.3	903 Hillside; data objectives satisfied	NC
01497	J	11	25	2	PVC	13	PU&D Yard; data objectives satisfied	NC
01697	J	11	28.35	0.75	PVC	18.46	PU&D Yard; data objectives satisfied	NC
0186	U	4	10.2	2	316 SS	3.19	Woman Creek at Indiana St.; redundant	NC
02697	P	10	28.4	2	PVC	16.14	Northeast of East Trenches; data objectives satisfied	NC
02797	Q	10	43.6	2	PVC	31.31	Northeast of East Trenches; data objectives satisfied	NC
02897	Q	10	39	2	PVC	21.74	Northeast of East Trenches; data objectives satisfied	NC
03791	O	10	50	2	PVC	38	East Trenches area; data objectives satisfied	NC
0386	U	10	23.67	2	316 SS	10.36	Indiana St. north of East Gate; data objectives satisfied	NC
04191	O	9	19.1	2	PVC	7.1	East Trenches area; data objectives satisfied	NC
04591	P	9	46.1	2	PVC	34.1	East Trenches area; data objectives satisfied	NC
0487*	L	7	19.7	2	316 SS	3.51	OU1 Plume; CAD/ROD modification	NC
04991	P	9	42.3	2	PVC	30.3	East of East Trenches; data objectives satisfied	NC
05091	P	9	46	2	PVC	34	East of East Trenches; data objectives satisfied	NC
05191	P	9	48	2	PVC	36	East of East Trenches; data objectives satisfied	NC
06091	P	10	42.7	2	PVC	30.7	Northeast of East Trenches; data objectives satisfied	NC
06491	U	11	17.9	2	PVC	10.9	Indiana St. north of East Gate; data objectives satisfied	NC

Well	Map Grid		Casing TD (ft. bgs)	Casing ID (in.)	Casing Material	Top of Screen (ft. bgs)	Location; Reason for Abandonment	Final Grade (With Respect to Current Grade) (ft.)
	E-W	N-S						
07991	O	9	28.1	2	PVC	16.1	East Trenches area; data objectives satisfied	NC
10194	P	9	43	2	PVC	30.8	East Trenches area; data objectives satisfied	NC
10694*	P	12	8	2	PVC	3.7	Inlet to Pond A-4; data objectives satisfied	NC
10794*	R	13	6.8	2	PVC	2.5	Eastern Walnut Creek; data objectives satisfied	NC
1086	J	12	23.78	2	316 SS	3.29	West of Present Landfill; data objectives satisfied	NC
10894*	T	13	10.2	2	PVC	3	Eastern Walnut Creek; data objectives satisfied	NC
10992*	L	7	31.28	2	PVC	4.94	OU1 Plume; CAD/ROD modification	NC
10994*	K	7	19.7	2	PVC	12.2	Woman Creek; data objectives satisfied	NC
11092*	M	7	20.51	2	PVC	5	OU1 Plume; CAD/ROD modification	NC
11094*	J	7	9.75	2	PVC	2.4	Woman Creek; data objectives satisfied	NC
11494	B	8	69.5	2	PVC	52	West of western quarries; data objectives satisfied	NC
11891	N	10	30	2	PVC	13	East Trenches area; data objectives satisfied	NC
1190	J	13	34.8	2	PVC	14.3	Northwest BZ; data objectives satisfied	NC
12094*	P	13	12	2	PVC	5.6	No Name Gulch; data objectives satisfied	NC
13103*	G	7	21.2	1	PVC	5.1	Ash Pits; data objectives satisfied	NC
13403*	G	7	19.5	1	PVC	4.4	Ash Pits; data objectives satisfied	NC
1386 ^A	N	11	9.5	2	316 SS	3.09	N. Walnut Creek	NC
1487	N	8	24.3	2	316 SS	19	903 Hillside; data objectives satisfied	NC
1786*	M	11	13.98	2	316 SS	3.73	North Walnut Creek; redundant, data objectives satisfied	NC
20296	H	11	58.65	2	PVC	30.41	Northwest BZ; data objectives satisfied	NC
20991	O	9	65	2	PVC	21	East Trenches area; data objectives satisfied	NC
23096	N	7	16	2	PVC	4	Woman Creek; data objectives satisfied	NC
2687	O	9	13.7	2	316 SS	4	East Trenches area; data objectives satisfied	NC
30100	K	11	26	0.75	PVC	5.03	PU&D Yard; data objectives satisfied	NC
30600	L	12	31	0.75	PVC	5.15	PU&D Yard; data objectives satisfied	NC
30991	M	7	12.25	2	PVC	5.1	Woman Creek; data objectives satisfied	NC
31001*	J	11	22.2	0.75	PVC	2.6	PU&D Yard; data objectives satisfied	NC
32591	L	7	18.9	2	PVC	11.5	881 Hillside; data objectives satisfied	NC
3686	N	10	6.5	2	316 SS	3.5	South Walnut Creek; data objectives satisfied	NC
38591	L	7	9.66	2	PVC	5.66	Woman Creek; data objectives satisfied	NC
38991	M	7	38.8	2	PVC	26.8	881 Hillside; data objectives satisfied	NC
3986	R	11	31.5	2	316 SS	5	East BZ; data objectives satisfied	NC
40991*	O	12	9.73	2	PVC	5.9	N. Walnut Creek/Pond A-2; data objectives satisfied	NC
41091*	Q	13	12.3	2	PVC	7.8	N. Walnut Creek/Pond A-4; data objectives satisfied	NC
41491	U	4	12	2	PVC	6.8	Woman Creek at Indiana St.; data objectives satisfied	NC
41591	U	8	13.5	2	PVC	6.34	Indiana St. south of East Gate; data objectives satisfied	NC
4286	O	9	29.7	2	316 SS	6.12	East Trenches area; data objectives satisfied	NC
4287*	M	13	6.6	2	316 SS	3	No Name Gulch; data objectives satisfied	NC
4786	F	10	94.49	2	316 SS	6.23	West BZ; data objectives satisfied	NC

Well	Map Grid		Casing TD (ft. bgs)	Casing ID (in.)	Casing Material	Top of Screen (ft. bgs)	Location: Reason for Abandonment	Final Grade (With Respect to Current Grade) (ft.)
	E-W	N-S						
4787*	L	7	7.5	2	316 SS	3.5	OU1 Plume; CAD/ROD modification	NC
4887*	L	7	10.3	2	316 SS	3.5	OU1 Plume; CAD/ROD modification	NC
50092	N	7	13.1	2	PVC	5.3	Woman Creek/Pond C-1; data objectives satisfied	NC
50192*	Q	7	12.85	2	PVC	5	Woman Creek/Pond C-2; data objectives satisfied	NC
50292*	Q	7	12.35	2	PVC	4.5	Woman Creek/Pond C-2; data objectives satisfied	NC
51094	F	8	60	2	PVC	37.7	West BZ; data objectives satisfied	NC
51193	N	7	10	2	PVC	5.15	Woman Creek/Pond C-1; data objectives satisfied	NC
51494	F	8	70.7	2	PVC	48.7	West BZ; data objectives satisfied	NC
52894*	M	13	6	2	PVC	3	Downgradient Present Landfill; redundant	NC
52994*	M	13	17	2	PVC	10	Downgradient Present Landfill; redundant	NC
5586	F	5	36.39	2	316 SS	3.55	Southwest BZ; data objectives satisfied	NC
5587	L	7	7.5	2	316 SS	3.35	Woman Creek; data objectives satisfied	NC
58793*	H	7	27.3	2	PVC	14.8	Ash Pits; data objectives satisfied	NC
5887*	J	12	22.5	2	316 SS	3.5	Upgradient Present Landfill; redundant	NC
59093*	G	7	17.15	2	PVC	4.3	Ash Pits; data objectives satisfied	NC
60195	N	10	11	0.75	PVC	6	S. Walnut Creek; data objectives satisfied	NC
60395	O	10	8.3	0.75	PVC	3.4	S. Walnut Creek; data objectives satisfied	NC
61495	J	11	12.2	0.75	PVC	7.2	PU&D Yard; data objectives satisfied	NC
61595	K	11	10.9	0.75	PVC	6	PU&D Yard; data objectives satisfied	NC
62593*	G	7	8.4	0.4	Teflon	3.4	Ash Pits; data objectives satisfied	NC
62893	J	7	14.8	0.4	Teflon	9.8	664 hillside; data objectives satisfied	NC
63093*	G	7	24.8	2	PVC	7	Ash Pits; data objectives satisfied	NC
6486	M	7	9	2	316 SS	3.41	Woman Creek/Pond C-1; data objectives satisfied	NC
6586	O	7	8	2	316 SS	2.5	Woman Creek between Ponds C-1, C-2; data objectives satisfied	NC
6886 ^A	K	7	3.5	2	316 SS	1.5	Woman Creek	NC
70099*	L	11	22	2	PVC	10.7	N. Walnut Creek/ SPPTS; data objectives satisfied	-0.39
70493*	J	12	46	2	PVC	24	Upgradient Present Landfill; redundant	NC
70799*	L	11	NIM	NIM	NIM	NIM	SPPTS; data objectives satisfied	1.62
7086*	J	7	7.9	2	316 SS	2.36	Woman Creek/Original Landfill	NC
70899*	L	11	NIM	0.75	NIM	NIM	SPPTS; data objectives satisfied	1.39
70999*	M	11	NIM	NIM	NIM	NIM	SPPTS System; data objectives satisfied	NC
71099*	L	11	NIM	NIM	NIM	NIM	SPPTS; data objectives satisfied	-0.28
71102*	L	11	34	1	PVC	23.81	SPPTS; data objectives satisfied	-0.4
71202*	L	11	34	1	PVC	26.99	SPPTS; data objectives satisfied	NC
71394*	H	7	12.6	2	PVC	5.6	Ash Pits/Woman Creek; data objectives satisfied	NC
75092*	Q	13	16.7	2	PVC	7.2	N. Walnut Creek/Pond A-4; data objectives satisfied	NC
75292*	Q	12	9.6	2	PVC	5.6	S. Walnut Creek/Pond B-5; data objectives satisfied	NC
75992	N	10	12	2	PVC	5	S. Walnut Creek; data objectives satisfied	-5.91
90099	N	8	19.3	2	PVC	11.9	903 Hillside; data objectives satisfied	NC
90603	N	8	25.5	1	PVC	5.4	903 Hillside; data objectives satisfied	NC
90903	M	8	24.5	1	PVC	4.45	903 Hillside; data objectives satisfied	NC

Well	Map Grid		Casing TD (ft. bgs)	Casing ID (in.)	Casing Material	Top of Screen (ft. bgs)	Location; Reason for Abandonment	Final Grade (With Respect to Current Grade) (ft.)
	E-W	N-S						
95503	O	10	35	1	PVC	4.2	East Trenches area; data objectives satisfied	NC
95699*	O	10	11.75	2	PVC	NIM	ETPTS; data objectives satisfied	NC
95799*	O	10	NIM	2	PVC	NIM	ETPTS; data objectives satisfied	NC
95899*	N	10	NIM	2	PVC	NIM	ETPTS; data objectives satisfied	NC
B200589	K	14	33.31	4	PVC	11.86	N. BZ; data objectives satisfied	NC
B200889	M	16	24.7	4	PVC	8.6	N. BZ; data objectives satisfied	NC
B208189	M	11	27.58	4	PVC	16.9	Solar Ponds Plume; data objectives satisfied	-1.02
B208289	N	11	16.16	4	PVC	5.95	Solar Ponds Plume/N. Walnut Creek; data objectives satisfied	NC
B402689	F	7	5.85	4	PVC	2.55	W. Woman Creek; data objectives satisfied	NC
TH046592*	O	10	19	2	PVC	6	Pond B-1 dam; data objectives satisfied	TBD
TH046792*	O	10	16	2	PVC	6.5	Pond B-1 dam; data objectives satisfied	TBD
TH046992 [▲] *	O	10	27	2	PVC	10	Pond B-3 dam	TBD
TH047092*	O	10	13	2	PVC	6	Pond B-3 dam; data objectives satisfied	TBD

Notes: All depths in feet below ground surface (at the time the well was installed).
 TD = total depth.
 ID = inside diameter (inches).
 * = see Special Considerations, below.
 ▲ = IMP well, to be replaced (see Section 5).
 SS = stainless steel.
 NC = no change.
 NIM = information is not recorded in the RFETS Master Well List.
 SPPTS = Solar Ponds Plume Treatment System.
 ETPTS = East Trenches Plume Treatment System.
 TBD = to be determined.

2.1 Special Considerations

Wells identified for pre-abandonment sampling (Section 4) should not be abandoned until sampling has been completed and analytical results reviewed. This allows the option of resampling, should any results appear anomalous. However, in some cases it will be necessary to accelerate abandonment of a well before the analytical results can be reviewed. WARP field personnel shall consult the WARP Project Manager prior to initiating abandonment activities at wells identified for pre-abandonment sampling to ensure data review has been completed whenever feasible.

Abandonment of several of the wells identified in Table 2-1 should be accelerated to support Site closure projects.

- Wells installed to provide piezometric data on the pond dams (identified in Table 2-1 with a TH0 prefix) need to be abandoned as soon as possible after sampling is concluded, as these dams are to be notched. This includes location TH046992, which is in the IMP and will be replaced. In this case, installation of the replacement well will be postponed until notching is completed, whereas abandonment of the well must take place before notching begins.

As discussed below, abandonment of a number of other wells in Table 2-1 shall be postponed until specific instruction to proceed with their abandonment has been issued by the WARP Project Manager.

- Wells used to sample the OU1 Plume (including 0487, 4787, 4887, 10992, and 11092) shall not be abandoned until the Corrective Action Decision/Record of Decision (CAD/ROD), which stipulates the specific groundwater monitoring required for this area, has been modified. The WARP Project Manager will advise the WARP field crew when the CAD/ROD modification has been finalized, after which these wells shall be abandoned. If not all of these wells are to be abandoned, the WARP Project Manager shall inform the WARP field crew of changes to the list of wells to be abandoned.
- Wells supporting the groundwater intercept/treatment systems shall not be abandoned until the required monitoring of these systems is finalized. In the BZ, these include wells 70099, 70799, 70899, 70999, 71099, 71102, 71202, and 1786 at the SPPTS; and wells 95699, 95799, and 95899 at the ETPTS. Wells at the Mound Site Plume Treatment System (MSPTS) are addressed in Section 3. The WARP Project Manager will advise the WARP field crew when these monitoring requirements are finalized, after which the designated wells shall be abandoned.
- Wells in the current monitoring network for the Present Landfill that are proposed for abandonment shall not be abandoned until the monitoring plan for that facility is finalized. The wells proposed to be abandoned are 5887, 70493, 52894, and 52994. The WARP Project Manager will advise the WARP field crew when the monitoring plan is finalized, after which the designated wells shall be abandoned.
- Well 7086, located south of the Original Landfill adjacent to Woman Creek, shall be abandoned after the Original Landfill project has determined that no additional data from this location are needed. The WARP Project Manager will advise the WARP field crew when well 7086 can be abandoned. This well will probably be replaced, but its location and construction detail have not been finalized. Therefore, installation of a replacement well for 7086 is not described in this WPA.
- Wells located adjacent to drainages shall not be abandoned until after April 2005 in case unanticipated adjustments to the IMP are made. These wells include 6486, 6586, 00193, 50192, and 50292 on Woman Creek; 75992 in South Walnut Creek; B208289, 40991, 10694, 75092, 41091, 10794, and 10894 in North Walnut/Walnut Creek; and 4287 and 12094 in No Name Gulch. These wells will be temporarily retained until April 1, 2005 to determine if they are needed. The WARP Project Manager will advise the WARP field crew when these wells can be abandoned.
- Wells in the Ash Pits area should not be abandoned until confirmation has been received from ER that all decisions regarding this area have been made and there is no further need to retain these monitoring locations. These wells include 62593, 59093, 63093, 58793, 13103, 13403, and 71394. The WARP Project Manager will advise the WARP field crew when these wells can be abandoned.

The WARP Project Manager shall be consulted prior to initiating abandonment of any of the above wells to ensure wells are not abandoned before the necessary approvals are obtained.

3.0 INDUSTRIAL AREA WELL ABANDONMENTS

A total of 163 wells in and adjacent to the IA will be abandoned through this WPA, including 23 that will be abandoned and replaced. Wells in the IA to be abandoned are displayed on Figure 2 and listed in Table 3-1. Additional abandonments and replacements in the IA may be noted in attachments to this WPA, and canceled abandonments may be noted by having the WARP Project Manager properly strike through, initial, and date the well entry in the table.

WARP activities within the IA must be planned and executed in more detail than those within the BZ. Working in the IA during ongoing Site closure activities presents hazards that are typically not present in the BZ. Heavy equipment traffic, normal vehicular traffic, pedestrian traffic, new rail traffic, and elevated ambient noise levels (though below a level requiring hearing protection) can all contribute to accidents and injuries. Conditions may change daily or even within the hour in a given work area or at a given well, requiring WARP crews to be particularly attentive.

A dense network of aboveground and buried utilities remains in the IA. While more and more are inactive and all will eventually be taken out of service, even inactivated utilities should be avoided. Advance coordination with the Excavation Specialists remains a critical requirement; if anything unexpected is encountered, the activity shall pause while conditions are evaluated and supervision is contacted.

Finally, as discussed in Section 1, with few exceptions the scheduled abandonments in the IA shall be the primary focus in the early part of the year. Although it would be more convenient to wait until closure projects have concluded and then abandon these wells, in most cases this will not be feasible or efficient because the closure projects may damage or destroy wells (making proper, efficient abandonment more difficult), and the wells may pose obstructions to closure projects and grading efforts. As a result, it will be necessary to promptly abandon wells in the IA both proactively and in response to requests from the various closure projects. The WARP field crew shall maintain a state of readiness to respond to these requests as quickly and efficiently as possible, while ensuring all activities are performed safely and compliantly.

Section 3.1 provides special considerations that apply to some of these wells before they can be abandoned.

Wells to be abandoned within the IA (Table 3-1) are listed in numeric order. References to final grade are in comparison to current elevations. Negative values indicate that the final ground surface will be lower than the current ground surface (i.e., a cut will take place); positive values indicate the ground surface will be higher at closure (i.e., fill will be added).

Table 3-1 FY05 Industrial Area Well Abandonments

Well	Map Grid		Casing TD (ft. bgs)	Casing ID (in.)	Casing Material	Top of Screen (ft. bgs)	Location; Reason for Abandonment	Final Grade (With Respect to Current Grade) (ft.)
	E-W	N-S						
00100*	L	10	31.6	0.75	PVC	6.95	B779; data quality objectives satisfied	1.67
00191*	N	9	27	2	PVC	15	903 Pad; data quality objectives satisfied	NC
00200^	L	10	20	0.75	PVC	3.96	B707; in the way of demolition activities	3.36
00300	L	9	20.34	0.75	PVC	2.3	B707; data quality objectives satisfied	3.86
00400*	K	10	20	0.75	PVC	5.38	B776; data quality objectives satisfied	0.23
00500*	L	10	20.2	0.75	PVC	5.31	B776; data quality objectives satisfied	0.95
00600*	L	10	20	0.75	PVC	5.3	B776; data quality objectives satisfied	-0.4
00700*	K	10	31	0.75	PVC	6	B776; data quality objectives satisfied	1.31
01391	M	9	16	2	PVC	6	Central Ave. Ditch; data quality objectives satisfied	-1.41
0187	K	8	12.08	2	316 SS	3.38	B881; data quality objectives satisfied	-8.79
02091	N	9	32.6	2	PVC	15.6	Mound area; data quality objectives satisfied	NC
02397*	L	10	11.12	0.75	PVC	6.07	B779; data quality objectives satisfied	-1.47
02491	N	9	18.8	2	PVC	11.8	Mound area; data quality objectives satisfied	-1.95

Well	Map Grid		Casing TD (ft. bgs)	Casing ID (in.)	Casing Material	Top of Screen (ft. bgs)	Location; Reason for Abandonment	Final Grade (With Respect to Current Grade)(ft.)
	E-W	N-S						
02497*	L	10	11.1	0.75	PVC	6.048	B779; data quality objectives satisfied	1.66
02500*	L	10	14.9	0.75	PVC	4.94	B779; data quality objectives satisfied	-0.71
05293	L	10	9.7	2	PVC	2.7	750 Pad; data quality objectives satisfied	-3.6
07291*	M	8	22.6	2	PVC	10.6	903 Pad; data quality objectives satisfied	NC
09691*	N	8	16	2	PVC	6	903 Hillside; data quality objectives satisfied	NC
10098	I	9	8.8	0.75	PVC	3.8	B123; data quality objectives satisfied	NC
10197	M	10	16.45	0.75	PVC	12.45	Mound area; data quality objectives satisfied	-6.77
10198	I	9	5.3	0.75	PVC	13.2	B123; data quality objectives satisfied	NC
10298	I	9	15.7	0.75	PVC	5.8	B123; data quality objectives satisfied	NC
10398	I	9	11.3	0.75	PVC	5.3	B123; data quality objectives satisfied	NC
10498*	I	9	12.1	0.75	PVC	6.1	B123; data quality objectives satisfied	NC
10598	I	9	8.2	0.75	PVC	2.3	B123; data quality objectives satisfied	-0.23
11602	K	8	49.7	2	PVC	17.4	B850; data quality objectives satisfied	NC
15199*	N	10	11.3	2	PVC	4.3	MSPTS; data quality objectives satisfied	0.35
15299*	N	10	11	2	PVC	6	MSPTS; data quality objectives satisfied	0.09
15399*	N	10	9.3	2	PVC	4.3	MSPTS; data quality objectives satisfied	1.09
15499*	N	10	12.5	2	PVC	5.5	MSPTS; data quality objectives satisfied	1.52
15599*	N	10	9	2	PVC	4	MSPTS; data quality objectives satisfied	2.76
15799*	N	10	10.4	2	PVC	5.4	MSPTS; data quality objectives satisfied	1.49
16199*	N	10	11.25	NIM	NIM	NIM	MSPTS; data quality objectives satisfied	TBD
16299*	N	10	12.42	NIM	NIM	NIM	MSPTS; data quality objectives satisfied	TBD
16399*	N	10	13.9	NIM	NIM	NIM	MSPTS; data quality objectives satisfied	TBD
16499*	N	10	13.08	NIM	NIM	NIM	MSPTS; data quality objectives satisfied	TBD
16599*	N	10	14.57	NIM	NIM	NIM	MSPTS; data quality objectives satisfied	TBD
18299	K	10	23.6	2	PVC	8.6	IHSS 118.1 area; data quality objectives satisfied	-0.87
18399	K	10	16	2	PVC	5.4	IHSS 118.1 area; data quality objectives satisfied	0.16
18699*	K	10	17.7	2	PVC	5.7	IHSS 118.1 area; data quality objectives satisfied	-0.17
18799*	K	10	12.9	2	PVC	5.9	IHSS 118.1 area; data quality objectives satisfied	0.3
1986^	K	10	12.25	2	316 SS	3	B374-700 Area drainage; SS construction	-0.22
20098	L	11	22.3	0.75	PVC	12.3	N. PA Plume; data quality objectives satisfied	0.25
20198	L	11	10	0.75	PVC	5	N. PA Plume; data quality objectives satisfied	-0.18
20298^	L	11	11.5	0.75	PVC	6.6	N. Patrol Rd.; inadequate for long-term monitoring	-0.05
20398	K	11	23.2	0.75	PVC	10.4	N. PA Plume; data quality objectives satisfied	-1.41
20498	K	11	22.3	0.75	PVC	12.4	N. PA Plume; data quality objectives satisfied	-1.37
20598^	K	11	15.5	0.75	PVC	5.7	N. Patrol Rd.; inadequate for long-term monitoring	-0.8
20691	N	9	25	2	PVC	4.5	Eastern IA; data quality objectives satisfied	NC
20698	K	11	21.9	0.75	PVC	12	N. PA Plume; data quality objectives satisfied	-2.02
20798^	K	11	27.2	0.75	PVC	15.4	N. Patrol Rd.; inadequate for long-term monitoring	-2.26
20898	K	11	16.1	0.75	PVC	7.8	N. PA Plume; data quality objectives satisfied	0.13
21198	K	10	29.4	0.75	PVC	14.7	N. PA Plume; data quality objectives satisfied	-2.14

Well	Map Grid		Casing TD (ft. bgs)	Casing ID (in.)	Casing Material	Top of Screen (ft. bgs)	Location; Reason for Abandonment	Final Grade (With Respect to Current Grade) (ft.)
	E-W	N-S						
21298	K	10	20	0.75	PVC	10.1	N. PA Plume; data quality objectives satisfied	-0.32
21398 ^A	K	10	14	0.75	PVC	7.1	Sixth St.; inadequate for long-term monitoring	-3.94
21498	K	10	11	0.75	PVC	6	N. PA Plume; data quality objectives satisfied	-0.31
21598 ^A	K	10	14	0.75	PVC	6.1	Sixth St.; inadequate for long-term monitoring	-0.06
21698 ^A	K	10	15.8	0.75	PVC	5.9	Sixth St.; inadequate for long-term monitoring	-0.04
21798	J	10	26	0.75	PVC	16.1	N. PA Plume; data quality objectives satisfied	-1.96
2187 ^{A*}	M	9	10.555	2	316 SS	3.255	S. Walnut Ck. drainage; SS construction	-0.31
21898	J	10	22	0.75	PVC	12.2	N. PA Plume; data quality objectives satisfied	-3.14
21998	J	10	20	0.75	PVC	12.2	N. PA Plume; data quality objectives satisfied	5.22
22098	J	10	25	0.75	PVC	10.4	N. PA Plume; data quality objectives satisfied	6.21
22198	L	11	17.6	0.75	PVC	7.6	N. PA Plume; data quality objectives satisfied	-1.69
22298 ^A	L	11	16.4	0.75	PVC	6.5	N. Patrol Rd.; inadequate for long-term monitoring	NC
22796	K	11	19	2	PVC	7	B771; data quality objectives satisfied	-1.01
22896 [*]	K	10	26.2	2	PVC	13.3	B566; data quality objectives satisfied	-9.91
33803 [*]	I	10	27.5	1	PVC	5.3	PACS 2; data quality objectives satisfied	NC
3386 [*]	M	9	7.34	2	316 SS	2.99	Eastern S. Walnut Creek; data quality objectives satisfied	-1.45
3586 [*]	N	10	11.6	2	316 SS	4.86	S. Walnut Creek; data quality objectives satisfied	1.25
37101 ^{A*}	I	10	20.1	0.75	PVC	5.17	B371; in the way of demolition activities	-2.51
37201 [*]	J	10	29.7	0.75	PVC	4.92	B371; data quality objectives satisfied	0.15
37301 [*]	J	10	24	0.75	PVC	4.93	B371; data quality objectives satisfied	0.94
37402 ^{A*}	J	10	41.25	0.75	PVC	8.87	B371; in the way of demolition activities	1.17
37501 ^{A*}	J	10	36.93	0.75	PVC	9.81	B371; in the way of demolition activities	0.98
37601 [*]	J	10	37.8	0.75	PVC	8.25	B371; data quality objectives satisfied	-1.55
37701 ^{A*}	J	10	20.05	0.75	PVC	2.9	B371; in the way of demolition activities	14.2
37791	K	8	22.6	2	PVC	10.6	B881; data quality objectives satisfied	0.9
38291	L	8	10.7	2	PVC	6.7	881 Hillside; data quality objectives satisfied	NC
39691 ^A	K	8	11	2	PVC	7	B881; in the way of demolition activities	NC
40099 ^{A*}	J	8	28.35	0.75	PVC	13.42	B444; in the way of demolition activities	3.47
40199 [*]	J	8	27.95	0.75	PVC	12.73	B444; data quality objectives satisfied	2.14
40299 ^{A*}	J	8	27.58	0.75	PVC	12.78	B444; in the way of demolition activities	4.14
40399 ^{A*}	J	8	24.8	0.75	PVC	12.7	B444; in the way of demolition activities	-0.23
40499 [*]	J	8	25	0.75	PVC	15.1	B444; data quality objectives satisfied	2.51
40999	L	9	10.3	0.75	PVC	5.1	B886; data quality objectives satisfied	NC
41099	L	9	10.5	0.75	PVC	4.62	B886; data quality objectives satisfied	NC
41102	L	9	20.5	1	PVC	5.31	B886; data quality objectives satisfied	NC
41299 [*]	J	8	25	0.75	PVC	10.5	B444; data quality objectives satisfied	4.3
4386	M	9	16.75	2	316 SS	3.99	N. 903 Pad; data quality objectives satisfied	NC
4387	L	8	12.5	2	316 SS	3.5	881 Hillside; data quality objectives satisfied	NC
44202	J	9	30.4	1	PVC	5.4	B442; data quality objectives satisfied	NC
44303	J	9	29.7	1	PVC	4.6	B443; data quality objectives satisfied	NC

Well	Map Grid		Casing TD (ft. bgs)	Casing ID (in.)	Casing Material	Top of Screen (ft. bgs)	Location; Reason for Abandonment	Final Grade (With Respect to Current Grade)(ft.)
	E-W	N-S						
50099*	N	9	21.7	2	PVC	10.7	903 Pad; data quality objectives satisfied	NC
5187^	K	8	14	2	316 SS	3.58	B881; in the way of demolition activities	12.04
55901^*	J	10	26.9	1	PVC	9.77	B559; in the way of demolition activities	-4.35
56001*	J	10	24	1	PVC	8.79	B559; data quality objectives satisfied	-0.38
56101*	J	10	25	1	PVC	7.89	B559; data quality objectives satisfied	3.17
56201*	J	10	26	1	PVC	8.8	B559; data quality objectives satisfied	-0.7
56301^*	J	10	27	1	PVC	9.97	B559; in the way of demolition activities	0.61
60299*	K	10	9.9	0.75	PVC	4.9	E. IA Plume/B776; data quality objectives satisfied	3.21
60499	K	10	15.1	0.75	PVC	7.95	E. IA Plume/B707; data quality objectives satisfied	3.09
60599	K	9	10.05	0.75	PVC	5.01	E. IA Plume/B707; data quality objectives satisfied	6.27
60699	K	9	10.21	0.75	PVC	5.19	E. IA Plume/B707; data quality objectives satisfied	7.33
60799*	K	9	9.89	0.75	PVC	4.87	E. IA Plume; data quality objectives satisfied	-0.89
60899	K	9	12.3	0.75	PVC	6.4	E. IA Plume/PACS 1; data quality objectives satisfied	NC
61099*	K	9	16.1	0.75	PVC	9.24	E. IA Plume/B879; data quality objectives satisfied	NC
61199*	K	8	19.5	0.75	PVC	9.3	E. IA Plume/B883; data quality objectives satisfied	NC
61299*	K	8	12.16	0.75	PVC	7.19	E. IA Plume/B883; data quality objectives satisfied	-0.79
61399*	K	9	10.03	0.75	PVC	4.98	E. IA Plume; data quality objectives satisfied	0.97
61499	L	10	10.08	0.75	PVC	4.89	E. IA Plume/B707; data quality objectives satisfied	2.06
6186	K	9	12.25	2	316 SS	5	E. IA Plume; data quality objectives satisfied	NC
6286	M	8	35.19	2	316 SS	25.22	903 Hillside; data quality objectives satisfied	NC
68194	I	9	8.6	2	PVC	8.6	Garage; data quality objectives satisfied	NC
68294	I	9	4.7	2	PVC	4.7	Garage; data quality objectives satisfied	NC
68394	J	9	4.15	2	PVC	4.15	Garage; data quality objectives satisfied	NC
68494	J	9	5.46	2	PVC	5.46	Garage; data quality objectives satisfied	NC
77492*	K	11	24.1	2	PVC	12.1	B771/B790; data quality objectives satisfied	0.48
83101*	J	8	21.5	1	PVC	6.4	B883; data quality objectives satisfied	NC
83201*	J	8	20	1	PVC	4.02	B883; data quality objectives satisfied	NC
84002	I	8	28	1	PVC	7.7	IA Plume; data quality objectives satisfied	-1.62
84102	J	8	24.8	1	PVC	7.79	IA Plume; data quality objectives satisfied	NC
84202	K	8	24	1	PVC	6.98	IA Plume; data quality objectives satisfied	NC
84302	K	8	18.5	1	PVC	6.4	IA Plume; data quality objectives satisfied	NC
84402	J	9	23.5	1	PVC	8.4	IA Plume; data quality objectives satisfied	NC
84502	K	9	23	1	PVC	7.89	IA Plume; data quality objectives satisfied	-0.21
84602*	I	9	26.5	0.75	PVC	9.76	IA Plume; data quality objectives satisfied	NC
84702	I	9	27	1	PVC	9.99	IA Plume; data quality objectives satisfied	NC
84802	I	9	29.8	1	PVC	7.91	IA Plume; data quality objectives satisfied	NC
84902	I	9	30	1	PVC	8.04	IA Plume; data quality objectives satisfied	NC
85002	I	10	31.5	1	PVC	9.5	IA Plume; data quality objectives satisfied	NC
85102	I	9	32	1	PVC	9.8	IA Plume; data quality objectives satisfied	NC
85202	I	9	28.5	1	PVC	6.3	IA Plume; data quality objectives satisfied	NC
85302	I	9	34	1	PVC	11.8	IA Plume; data quality objectives satisfied	NC
86501*	J	9	24	1	PVC	4.28	B865; data quality objectives satisfied	NC

Well	Map Grid		Casing TD (ft. bgs)	Casing ID (in.)	Casing Material	Top of Screen (ft. bgs)	Location; Reason for Abandonment	Final Grade (With Respect to Current Grade) (ft.)
	E-W	N-S						
86601	K	9	24	1	PVC	4.3	B865; data quality objectives satisfied	NC
86701	K	8	20	1	PVC	4.14	B865; data quality objectives satisfied	NC
88101 [▲]	K	8	30.5	1	PVC	6.92	B881; in the way of demolition activities	11.24
90402*	M	8	20	2	PVC	7.74	903 Pad; data quality objectives satisfied	NC
90502*	M	8	18	2	PVC	5.75	903 Pad; data quality objectives satisfied	NC
91104 ^{▲*}	M	9	19.6	1	SS	4.5	Oil Burn Pit #2; in the way of remediation	NC
99101	L	9	20.5	1	PVC	5.29	B991; data quality objectives satisfied	4.19
99201	L	10	29.71	1	PVC	4.5	B991; data quality objectives satisfied	0.31
99301 [▲]	L	9	30	0.75	PVC	4.68	B991; in the way of demolition activities	3.94
99401 [▲]	L	9	21.5	0.75	PVC	4.75	B991; in the way of demolition activities	0.98
P114789*	J	9	27.7	2	PVC	21.81	PACS 2; data quality objectives satisfied	NC
P114889	J	9	15.55	2	PVC	9.89	PACS 2; data quality objectives satisfied	NC
P115489	J	9	27.75	2	PVC	22.09	Fire Dept.; data quality objectives satisfied	NC
P115689	K	9	21.31	2	PVC	16.23	B551; data quality objectives satisfied	NC
P119389*	I	10	18.21	2	PVC	12.5	B371; data quality objectives satisfied	NC
P209389	L	10	30.05	4	PVC	16.82	B774; data quality objectives satisfied	0.79
P209889	L	11	19.63	4	PVC	8.89	Solar Evaporation Ponds; data quality objectives satisfied	NC
P213689	K	9	14.8	2	PVC	9.08	PACS 1; data quality objectives satisfied	NC
P215789	K	9	19.59	2	PVC	14.53	PACS 1; data quality objectives satisfied	-2.39
P218089	L	9	8.69	4	PVC	3	B707; data quality objectives satisfied	4.88
P218389	M	10	13.77	2	PVC	8.06	Solar Evaporation Ponds; data quality objectives satisfied	1.32
P219489	M	10	24.2	2	PVC	18.48	Solar Evaporation Ponds; data quality objectives satisfied	NC
P414189	J	9	19.78	2	PVC	14.09	224 Tank; data quality objectives satisfied	NC
P415889	H	9	44.5	2	PVC	38.75	W. IA; data quality objectives satisfied	NC
P416189	I	8	30.94	2	PVC	25.23	SW IA; data quality objectives satisfied	NC
P416289	I	8	24.77	2	PVC	19.07	B124; data quality objectives satisfied	0.44
P416689	I	8	33.76	2	PVC	32	B440; data quality objectives satisfied	-0.56
P416789	J	8	28.2	2	PVC	22.48	B440; data quality objectives satisfied	-0.97

Notes: All depths in feet below ground surface (at the time the well was installed).

TD = total depth.

ID = inside diameter (inches).

* = see Special Considerations, below.

▲ = IMP well, to be replaced (see Section 5).

SS = stainless steel.

NC = no change.

NIM = information is not recorded in the RFETS Master Well List.

MSPTS = Mound Site Plume Treatment System.

TBD = to be determined.

3.1 Special Considerations

Wells identified for pre-abandonment sampling (Section 4) should not be abandoned until sampling has been completed and analytical results reviewed. This allows the option of resampling, should any results appear anomalous. However, in some cases it will be necessary to accelerate abandonment of a well before the analytical results can be reviewed. WARP field personnel shall consult the WARP Project Manager prior to initiating abandonment activities at wells identified for pre-abandonment sampling to ensure data review has been completed whenever feasible.

Abandonment of many of the wells identified in Table 3-1 should be accelerated to support Site closure projects, as discussed below. The relative priority of these groups of wells is uncertain and is expected to evolve as work proceeds. To the extent it is feasible, the WARP field crew should plan to complete all abandonments in these groups before performing other WARP activities. Abandonment of IMP wells that are in the way of closure activities (and will subsequently be replaced) may need to be postponed to allow them to be sampled before they are abandoned. Closure projects may require the wells to be abandoned before the routinely-scheduled sampling time. Therefore, it may be necessary to either sample these wells during the first quarter or wait until well replacements are installed and sample the replacements. The latter option is preferred, but this decision will be made on a case-by-case basis. Coordination between the WARP Project Manager, Water Programs Sampling Liaison, WARP field crew, and the various closure projects will be necessary to ensure timely sampling, abandonment, and replacement of wells.

- Wells along the proposed path of the new rail spur to B371 need to be abandoned. These wells include P114789, 37201, 33803, and P119389. Field walkdowns will be held as that project is planned in detail and additional abandonments may be identified. The WARP field crew and WARP Project Manager will consult to ensure all affected wells are included in this list.
- Most of the wells along the path of the new rail spur to B776 have been abandoned, but some may be in such proximity that they should be abandoned promptly. These wells include 00600 and 18699. In addition, because of its proximity to a pile of excavated soils that may be moved in the near future, well 84602 should be abandoned promptly.
- Wells around B883 shall be abandoned to support closure of that facility. These wells include 61099, 61199, 61299, 83101, 83201, and 86501.
- Wells around B776/777 and the former B779 shall be abandoned to support the B776/777 closure project. Closure plans for that facility include constructing a berm around the perimeter of the building, and many of the following wells may be in the way. Potentially-affected wells include 00100, 00400, 00500, 00700, 02500, 02397, 02497, 18799, and 60299.
- Wells 60799 and 61399 shall be abandoned as soon as possible. Their location on the south side of B707 puts them at risk of destruction (rendering proper abandonment difficult or impossible).
- Wells around B444 shall be abandoned to make way for closure of that facility. This includes wells 40099, 40199, 40299, 40399, 40499, and 41299. Of these, wells 40099, 40299, and 40399 are in the IMP and will be replaced after the facility has been demolished. Determination of the relative timing of sampling, well abandonment, and well replacement will be necessary before these wells are abandoned. However, due to the magnitude of the B444 project, it may be necessary to collect spring 2005 samples from the existing wells rather than the replacement wells.
- Well 91104 shall be abandoned as soon as possible to support remediation of the Oil Burn Pit #2 source area.
- Wells along the various Functional Channels (final grade ditches; referred to as FCs) shall be abandoned before the FCs are constructed. These features are displayed on Figure 3 (V. 12 of the grading plan), and are labeled FC-1 through FC-5. Because work on FC-3, the northern section of FC-2, and portions of FC-4 are scheduled first, wells in those areas should be abandoned promptly. At a minimum, this includes wells 77492, 3386, and 2187 (which is in the IMP and will be replaced after the FC work at this location is completed). The decision of whether to sample 2187 or its replacement will depend on the schedule of the FC work in this area and the installation of the replacement well. Additionally, as soon as the monitoring network for the MSPTS is finalized (see below), wells in the vicinity of that facility that are closest to South Walnut Creek should be abandoned to support the FC work. Wells along the central and southern portions of FC-2 (along Sixth Street) and other FCs should be abandoned to suit FC and IA grading schedules, which will be monitored by the WARP Project Manager.

- Wells around B371/374 and B559 should be abandoned in support of those closure projects. This includes wells 37101, 37201, 37301, 37402, 37501, 37601, and 37701 around B371/374; at B559, this includes wells 55901, 56001, 56101, 56201, 56301, and 22896. Several of these wells are in the IMP and will be replaced after the corresponding facility is removed and the land surface is graded. Whenever possible, time should be allowed for IMP wells (such as 37402, 37501, 37701, 55901, and 56301) that are scheduled for sampling in spring 2005 to be sampled before they are abandoned.
- Other wells that may need to be abandoned promptly include all flush-mount wells installed in asphalt or concrete, because these impervious surfaces will be removed as a part of Site closure. A few examples of these wells include those installed in the North Patrol Road, Sage Ave./PACS 2 parking lot, around B123, and well 11602. Several of these wells are in the IMP, requiring careful determination of the relative timing of sample collection, well abandonment, and well replacement. For those wells that are in the IMP, the possibility of protecting them should also be considered and discussed with the appropriate closure project before they are abandoned.

Abandonment of a number of other wells in Table 3-1 shall be postponed until specific instruction to proceed with their abandonment has been issued.

- Wells supporting the MSPTS shall not be abandoned until the required monitoring of this system is finalized. Included are wells 3586, 15199, 15299, 15399, 15499, 15599, 15799, 16199, 16299, 16399, 16499, and 16599. The WARP Project Manager will advise the WARP field crew when these wells can be abandoned.
- Except for well 4386 (which is damaged), abandonment of the wells that were previously used to monitor the 903 Pad should be postponed in case they can be utilized for groundwater performance monitoring of any of the accelerated actions in that area. The WARP Project Manager will advise the WARP field crew when wells in this area can be abandoned.
- Similar to well 7086 (as discussed in Section 2.1), wells P416689 and P416789 shall not be abandoned until the required monitoring of the Original Landfill is finalized. The WARP Project Manager will advise the WARP field crew when these wells can be abandoned.

As previously stated, additional well abandonments may need to be accelerated or postponed. If other wells must be abandoned, their abandonment and replacement will be added via an attachment to this WPA.

4.0 PRE- ABANDONMENT SAMPLING

Attempts to collect groundwater samples for selected analytes shall be made prior to abandoning many of the wells identified in this WPA. The primary purpose of pre-abandonment sampling is to collect a final set of field and analytical water quality data to be collected before the well is abandoned.

Many IMP wells are identified in this WPA for abandonment and replacement. As noted previously, where possible the replacement well will be installed before the original well is abandoned. However, in many cases this will not be feasible and there may be a delay before the replacement well can be installed. If the timing of the well replacement is such that the original well should be sampled prior to abandonment to meet IMP sampling requirements, sampling will be scheduled accordingly (even if that means sampling is performed outside the normal sampling period, such as during first calendar quarter instead of the normal second quarter). The various project schedules are too dynamic to identify instances where this will be the case. Therefore, the WARP Project Manager and Water Programs Sampling Liaison will need to maintain communication with the various closure projects, WARP crew, and sampling crews to ensure all IMP-required sampling is performed.

Non-IMP pre-abandonment sampling was identified for wells in or near areas of known groundwater contamination and which have undergone physical changes as a result of Site closure (e.g., removal of impervious surfaces).

Table 4-1 identifies those wells that are scheduled for abandonment and require non-IMP pre-abandonment sampling. Also shown are the corresponding analytical suites, which may include volatile organic compounds (VOCs), nitrates, uranium (U), and/or other analytes. For convenience, wells are grouped as presented in Sections 2 and 3. Sampling shall be performed in accordance with RMRS/OPS-PRO.113, Groundwater Sampling, or its successor document, with the modifications stated below. Scheduling of pre-abandonment sampling activities shall reflect accelerated Site closure activities that may require a well to be abandoned (and therefore sampled) more promptly than might otherwise be desired. Sample scheduling should also be based on the historical conditions at each well and on recharge events. Wells that have historically been more productive may be sampled at any time, while sampling of wells that are less productive should be scheduled to take advantage of recharge events. To ensure the scope defined in this WPA is completed in a timely fashion, **all pre-abandonment groundwater sampling shall be completed by June 1, 2005 (sooner if possible).**

Table 4-1 FY05 Pre-Abandonment Sampling Requirements

Well	Location; Reason for Sampling	VOCs	Nitrate	U*	Special
BUFFER ZONE					
00891	903 Hillside; no data	X			
01291	903 Hillside; no data since 1996	X			
02697	East Trenches area; insufficient data	X			
02797	East Trenches area; insufficient data	X			
10694	Pond A-4 inlet; water quality update		1	2(UI/UT)	
10994	Woman Creek; water quality update		X		
13103	Ash Pits; no data			UT	
13403	Ash Pits; no data			UT	
1487	903 Hillside; water quality update	X			
1786	N. Walnut Ck.; water quality update	3	1	2(UI, UT)	
3686	S. Walnut Ck.; water quality update	2	1	3(UI/UT)	
40991	Pond A-2 inlet; no data		1	2(UI/UT)	
60195	S. Walnut Ck.; insufficient data	X			
60395	S. Walnut Ck.; insufficient data	X			
62893	664 hillside; water quality update	X			
70099	N. Walnut Ck./SPPTS; water quality update		1	2(UI, UT)	
71102	N. Walnut Ck./SPPTS; no data		1	2(UI/UT)	
71202	N. Walnut Ck./SPPTS; no data		1	2(UI/UT)	
71394	Ash Pits; no data			UT	
75992	S. Walnut Ck.; water quality update			UI	
90903	903 Hillside; no data	X			

Well	Location; Reason for Sampling	VOCs	Nitrate	U*	Special
B208189	Solar Ponds Plume; water quality update		1	2(UI/UT)	
B208289	Solar Ponds Plume; water quality update		1	2(UI/UT)	
TH046592	Pond B-1 dam; insufficient data	X			
TH046792	Pond B-1 dam; insufficient data	X			
TH047092	Pond B-3 dam; insufficient data	X			
INDUSTRIAL AREA					
00100	B779/Solar Ponds; water quality update	2	1	3(UI/UT)	
00191	903 Pad; water quality update	X			
00500	B776/777, IHSS 118.1, Solar Ponds; water quality update	1	2	3(UI/UT)	
00600	B776/777, IHSS 118.1; water quality update	X			
00700	B776/777; water quality update	X			
02091	Mound/T-1 area; water quality update	1		2(UT)	
02491	Mound/T-1 area; water quality update	1		2(UT)	
02497	B779/Solar Ponds; water quality update	2	1	3(UI/UT)	
02500	B779/Solar Ponds; water quality update	2	1	3(UI/UT)	
07291	903 Pad; water quality update	X			
09691	903 Hillside; water quality update	1		2(UT)	
10197	Mound/Oil Burn Pit #2; water quality update	X			
10498	B123; water quality update	X			
11602	B850; insufficient data	X			
18799	IHSS 118.1; water quality update	X			
20098	N. PA Plume; water quality update	2	3	4(UI, UT)	1(PCB)
20198	N. PA Plume; water quality update	2	3	4(UI, UT)	1(PCB)
20298	N. PA Plume; water quality update	2	3	4(UI, UT)	1(PCB)
20398	N. PA Plume; water quality update	2	3	4(UI, UT)	1(PCB)
20498	N. PA Plume; water quality update	1	X	X(UI, UT)	
20598	N. PA Plume; water quality update	X	X	X(UI, UT)	
20691	903 Pad/East Trenches area N. Patrol Rd. ; insufficient data	X			
20698	N. PA Plume; water quality update	X	X	X(UI, UT)	
21198	N. PA Plume; water quality update	X			
21298	N. PA Plume; water quality update	X			
21398	N. PA Plume; water quality update	X			
21498	N. PA Plume; water quality update	X			
21698	N. PA Plume; water quality update	X			
21798	N. PA Plume; water quality update	X			
21898	N. PA Plume; water quality update	X			
21998	N. PA Plume; water quality update	X			
22098	N. PA Plume; water quality update	X			
22198	N. PA Plume; water quality update	3	1	2(UI, UT)	
22796	B771; ; water quality update	X	X		
22896	B566/B559; water quality update	X			
3386	S. Walnut Ck. ; water quality update		1	2(UT)	
44202	B443; water quality update	2			1(TPH)
44303	B443; water quality update	2			1(TPH)
50099	903 Pad; water quality update	1	2		
60899	PACS 2 lot; water quality update	X			
68194	Garage; water quality update	2			1(TPH)
68294	Garage; water quality update	2			1(TPH)
68394	Garage; water quality update	2			1(TPH)
68494	Garage; water quality update	2			1(TPH)
77492	B771/790; water quality update	1		2(UI/UT)	
85002	IA Plume; water quality update	X			
85202	IA Plume; water quality update	2			1(TPH)
90402	903 Pad; water quality update	1	2		
P114789	IA Plume; water quality update	X			
P114889	IA Plume; water quality update	X			
P115689	IA Plume; water quality update	X			
P209389	B774; water quality update	X			

Well	Location; Reason for Sampling	VOCs	Nitrate	U*	Special
P209889	Solar Ponds; water quality update		1	2(UI, UT)	
P213689	PACS 1; water quality update			UI, UT	
P218389	Solar Ponds; water quality update		1	2(UI, UT)	
P219489	Solar Ponds; water quality update		1	2(UI, UT)	
P416289	B124; water quality update	2			1(TPH)
P416789	S. IA Plume; water quality update	1	2		

NOTES:

Analytical methods for requested samples are to be consistent with those used for routine groundwater samples.

• Uranium may be requested as U isotopes or as total U or both. UI = uranium isotopes, UT = total uranium. UI/UT = collect UI if sufficient water, otherwise UT (but not both; only UI if there is plenty of water). If both are to be collected, UT is a lower priority than any of the other samples in the analytical suite. (Numerai) = Analyte requested, priority as stated; "1" = highest priority sample (i.e., collect before any other samples), "2" = next highest priority, etc. X = Analyte requested, no priority specified. Samples requested via "X" are always lower priority than samples requested via numeral. See text for additional discussion and explanation.

Wells found to be dry or having a water level below the bottom of the screen shall be brought to the attention of the Water Programs Sampling Liaison or WARP Project Manager **within one workday of discovery of this condition**. In most or all cases, these wells will be abandoned without sampling. However, there may be exceptions that will be defined by the Water Programs Sampling Liaison or WARP Project Manager. Unless instructed otherwise by these individuals, such exceptions will typically allow one additional sampling attempt. Unless otherwise directed by the Water Programs Sampling Liaison or WARP Project Manager, the number of sampling visits to a well that does produce water will be limited to three (not five as stated in the SOP).

Table 4-1 also identifies wells having specific analytical priorities, which are denoted numerically (i.e., the analyte assigned the number 1 has the highest priority, that assigned 2 would be the next most important, and so on). Where an analytical priority is defined for a well, sample collection shall proceed in the order specified. Where no priority is listed (i.e., each requested analyte is simply marked with an X), sample collection shall proceed according to RMRS/OPS-PRO.113 and the sample crew's discretion. Where priority is stated for a portion of the analytes required from a well, the numbered priority samples shall be collected first, in the order specified, then the sampling crew may use their discretion when collecting the balance of samples.

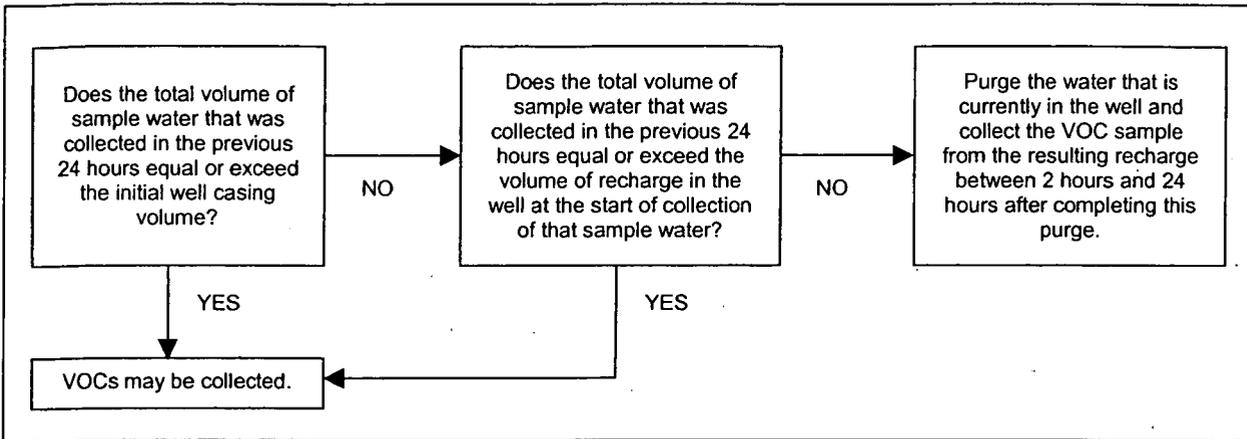
If the well purge indicates that collection of a large-volume sample is not feasible, yet such a sample is the top priority for that well, the sampling crew shall notify the WARP Project Manager or Water Programs Sampling Liaison for instruction **as soon as feasible and prior to beginning sample collection activities**. While it may be possible to skip the large-volume sample and collect those of smaller volume, it may be necessary to attempt to collect the larger sample and forego the smaller ones. **Sample collection shall not begin at such a well until the sampling crew has discussed the issues with the WARP Field Supervisor or Water Programs Sampling Liaison and received sampling instructions.**

In contrast to requirements stated in RMRS/OPS-PRO.113, **if a well dewateres during the purge, sample collection for any analyte except U shall not begin until at least 2 hours but no more than 24 hours have passed**. This will allow conditions in the well to stabilize somewhat while not allowing the recharge water in the well enough time to become stagnant.

Also, in contrast to requirements stated in RMRS/OPS-PRO.113, VOC samples are not necessarily the first sample that should be collected from some wells, depending on the analytical priority defined in Table 4-1. If VOC samples are required but are not the first priority, it will still be necessary to ensure the VOC sample represents fresh, rather than stagnant, groundwater. According to RMRS/OPS-PRO.113, this would normally be accomplished by collecting the VOCs as soon as possible (but no later than 48 hours) after the purge is completed. However, for all VOC pre-abandonment sampling presented in this WPA, the 48-hour limit is reduced to **24** hours and as noted above, these samples may not be collected from a well that has dewatered until it has been allowed to stabilize at least 2 hours.

In cases where the VOC samples are not the first priority, special considerations may be required to collect a representative VOC sample. If a lapse of more than 24 hours takes place between completion of the purge and the time when VOCs are to be collected, the groundwater sampling crew shall pause to assess whether samples collected in the previous 24 hours might adequately serve as a purge for the VOC sample. The crew shall follow the flowchart below when collecting the VOC sample. If none of the requirements specified

in the flowchart below can be met, or the sampling crew feels alternative solutions may be needed, the sampling crew shall contact the WARP Project Manager or Water Programs Sampling Liaison for discussion and resolution.



5.0 INSTALLATION OF REPLACEMENT WELLS

This section discusses the installation of 26 replacement wells. Each of these wells is in the IMP.

Reasons for the well replacements identified in this WPA vary. In some cases, the existing wells are not constructed and/or designed appropriately for long-term monitoring, and are therefore being replaced. In other cases, the existing wells must be abandoned to make way for Site closure activities that would destroy the wells, such as building demolition. The replacement wells will then be installed after the associated closure activity has concluded or has reached the point that the replacement wells will be safe from harm.

A map of scheduled replacement well locations is presented as Figure 4. Wells to be replaced are posted on this map, along with the replacement well numbers; the replacement wells should be located within approximately 5 ft. from the original wells, in a side- to upgradient direction. (The replacement for well 91104 will be an exception, as discussed below.) Actual installation locations will be selected in the field by the Rig Geologist, in coordination with the Excavation Specialists and, as necessary, representatives of any associated or impacted projects.

Table 5-1 lists well replacements, and Table 5-2 summarizes the well designs. Wells will be installed and constructed in accordance with Site SOPs. Those most specific to well installation activities include OPS-PRO.114, Drilling and Sampling Using Hollow Stem Auger and Rotary Drilling and Rock Coring Techniques; RMRS/OPS-PRO.124, Push Subsurface Soil Sampling; and PRO-1059-WELL-118, Monitoring Well Installation.

Although 26 replacement wells are scheduled to be installed through this WPA, other wells in the IMP may also need to be replaced (for example, due to damage incurred during Site closure activities). If additional well replacements are needed, they may be attached to this WPA by the WARP Project Manager.

In addition, new and/or replacement wells may be required to monitor the Present Landfill and the Original Landfill. Similarly, other closure activities (in particular, remediation of contaminated areas) may require additional groundwater monitoring. Well installations or replacements that are associated with a closure project such as the landfills or other remedial activities will be described in project-specific work control documents.

Table 5-1 Replacement wells scheduled for FY05

Well to be Replaced	Reason for Replacement
00200	Well is in the way of B707 closure activities and is insufficient for long-term monitoring
1386	Well is constructed of stainless steel
1986	Well is constructed of stainless steel
6886	Well is constructed of stainless steel
20298	Well is constructed of 3/4" PVC, insufficient for long-term monitoring
20598	Well is constructed of 3/4" PVC, insufficient for long-term monitoring
20798	Well is constructed of 3/4" PVC, insufficient for long-term monitoring
21398	Well is constructed of 3/4" PVC, insufficient for long-term monitoring
21598	Well is constructed of 3/4" PVC, insufficient for long-term monitoring
21698	Well is constructed of 3/4" PVC, insufficient for long-term monitoring
2187	Well is in the way of FC grading and is constructed of stainless steel
22298	Well is constructed of 3/4" PVC, insufficient for long-term monitoring
37101	Well is in the way of B371 closure activities and is insufficient for long-term monitoring
37402	Well is in the way of B371 closure activities and is insufficient for long-term monitoring
37501	Well is in the way of B371 closure activities and is insufficient for long-term monitoring
37701	Well is in the way of B371 closure activities and is insufficient for long-term monitoring
39691	Well is adjacent to a B881, and must be removed to support closure of that facility
40099	Well is in the way of B444 closure activities and is insufficient for long-term monitoring
40299	Well is in the way of B444 closure activities and is insufficient for long-term monitoring
40399	Well is in the way of B444 closure activities and is insufficient for long-term monitoring

Well to be Replaced	Reason for Replacement
55901	Well is in the way of B559 closure activities
56301	Well is in the way of B559 closure activities
91104	Well is in the way of Oil Burn Pit #2 remediation
99301	Well is in the way of B991 closure activities and is insufficient for long-term monitoring
99401	Well is in the way of B991 closure activities and is insufficient for long-term monitoring
TH046992	Well is adjacent to a dam that will be notched, and must be removed to support that activity

Notes:
FC = Functional Channels

The well designs shown in Table 5-2 are based on the construction of the original wells. Where appropriate, that construction will be improved. Depths are approximate, in feet below ground surface, and are subject to change based on field conditions and observations (both to improve well design and as a result of closure-related changes in ground surface). Ground elevation changes to reach final grade have been accounted for in the proposed construction depths (but not the bedrock depth). If the table specifies the use of a drill rig but a Geoprobe must be used, or vice versa, the WARP Project Manager will adjust well components and design accordingly. Flush-mount protection will only be installed if absolutely necessary; the preference for all wells is aboveground protection.

Table 5-2 Design of replacement wells

Former Well	Replacement Well	Bedrock Contact (Former Well)	Total Depth, (Former)/ Replacement Well	Top of Screened Interval, (Former)/ Replacement Well	Diameter and Type of Replacement Well Components	Method of Replacement Well Installation
00200	70705	7.1	(20) / 26	(3.96) / 7	1 in., PVC	Geoprobe - 1 done
1386	51605	9	(9.5) / 13	(3.09) / 5	2 in., PVC	Drill rig
1986	52505	11.5	(12.25) / 13	(3) / 5	2 in., PVC	Drill rig
20298	20205	11.4	(11.5) / 20	(6.6) / 6	2 in., PVC	Drill rig
20598	20505	14.5	(15.5) / 20	(5.7) / 6	2 in., PVC	Drill rig
20798	20705	26.2	(27.2) / 30	(15.4) / 13	2 in., PVC	Drill rig
21398	21305	13.1	(14) / 16	(7.1) / 5	1 in., PVC	Geoprobe - 2 *
21598	21505	13	(14) / 16	(6.1) / 6	1 in., PVC	Geoprobe - 3 *
21698	21605	13	(15.8) / 16	(5.9) / 6	1 in., PVC	Geoprobe - 4 *
2187	91305	8	(10.555) / 18	(3.255) / 5	2 in., PVC	Drill rig
22298	22205	16.6	(16.4) / 20	(6.5) / 5	2 in., PVC	Drill rig
37101	37105 *	15.9	(20.1) / 25	(5.17) / 5	1 in., PVC	Geoprobe - 5 *
37402	37405	26	(41.25) / 43	(8.87) / 8	2 in., PVC	Drill rig
37501	37505	25.9	(36.93) / 41	(9.81) / 8	2 in., PVC	Drill rig
37701	37705	4	(20.05) / 35	(2.9) / 8	2 in., PVC	Drill rig
39691	39605	8	(11) / 20	(7) / 5	1 in., PVC	Geoprobe - 6 done
40099	40005	27	(28.35) / 32	(13.42) / 10	2 in., PVC	Drill rig
40299	40205	27.6	(27.58) / 32	(12.78) / 10	2 in., PVC	Drill rig
40399	40305	23.8	(24.8) / 30	(12.7) / 10	2 in., PVC	Drill rig
55901	55905	21.3	(26.9) / 26	(9.77) / 6	2 in., PVC	Drill rig
56301	56305	22	(27) / 30	(9.97) / 10	2 in., PVC	Drill rig
6886	42505	2.8	(3.5) / 18	(1.5) / 5	2 in., PVC	Drill rig
91104	91105	1	(19.6) / 20	(4.5) / 4	1 in., PVC*	Geoprobe - 7 done
99301	99305	8.2	(30) / 36	(4.68) / 6	2 in., PVC	Drill rig
99401	99405	4.4	(21.5) / 25	(4.75) / 5	2 in., PVC	Drill rig
TH046992	23305 *	25	(27) / 25	(10) / 5	2 in., PVC	Drill rig - NO CON

Notes:
All depths for "former" wells are in feet below ground surface at the time those wells were installed; depths for replacement wells are in feet below final grade.
*If NAPL is observed, well components shall be stainless steel.

Special requirements apply to replacement well 91105. This well will be offset in a generally northern (downgradient) direction from well 91104, and the amount of offset may exceed 5 ft. This well replaces well 91104, which monitors groundwater in the Oil Burn Pit #2 source area. This source area is scheduled to be

remediated, and well 91104 is within the planned excavation boundary. Well 91105 will be installed just outside the excavation boundary after remediation activities have concluded. Special care shall be paid during intrusive activities at this location and when preparing to develop this well, because of the potential for non-aqueous phase liquid (NAPL). If NAPL is observed, either as staining or free liquid, field personnel shall pause their activities and immediately inform the WARP Project Manager.

Well designs may be modified based on field observations (e.g., depth to bedrock contact, type of bedrock, presence of groundwater, etc.) made by the Rig Geologist and other crew members. In particular, if the Rig Geologist determines that a deeper boring will be necessary to obtain groundwater samples, the WARP Project Manager shall be contacted to discuss the conditions. If this is agreed upon, the borehole may be advanced accordingly. For wells installed with a drill rig, the top of the filter pack should not be shallower than about 5 ft. below final grade, unless that is necessary to meet the construction shown in Table 5-2. If a well design needs to be changed to include filter pack shallower than that depth, the WARP Project Manager shall be contacted and reasons for this change discussed. The filter pack in wells installed with a Geoprobe may be shallower than 5 ft. if necessary, but should not be shallower than about 3 ft. below final grade. Also, per the SOP, there should be between 0.5 ft. and 2 ft. of filter pack above the top of the screen.

Well Development and Sampling

Replacement wells shall be developed as soon after they are installed as is practicable. High-energy methods should be used (surging the water column) to clean out the filter pack and condition the borehole, unless the well is in an area in which there is reason to suspect the presence of a NAPL. If NAPL is present, the well shall not be developed.

After each well is developed, the WARP field crew shall inform the Water Programs Sampling Liaison that it can be sampled. The well shall then be sampled by Analytical Services Division (ASD) sampling personnel in accordance with the pertinent SOPs, according to the requirements set forth in the IMP as relayed by the Water Programs Sampling Liaison. A period of at least 72 hours shall pass after the conclusion of development activities before sampling activities (including purging) begin. Sampling methods shall be at the discretion of the Water Programs Sampling Liaison.

6.0 MISCELLANEOUS WARP ACTIVITIES

Prior to 1998, abandoned wells and boreholes were marked with concrete monuments. Removal of these monuments was performed as time allowed during 2003 and 2004. However, this activity has been eliminated from the WARP scope for 2005.

Several miscellaneous activities will be performed by WARP field personnel as time allows and as closure activities require. Existing IMP wells may be redeveloped, but only if warranted and time allows; this determination will be made by the WARP Project Manager. Redevelopment of existing wells will follow RMRS/OPS-PRO.106, Well Development.

Dedicated bladder pumps will be removed from all existing wells, whether they are scheduled for abandonment or retention in the IMP. This is because of documented problems of data quality from samples collected with these pumps. Used pumps and associated tubing and fittings will be rinsed and disposed as non-routine sanitary waste (NRSW), much like all other groundwater sampling equipment.

Down-hole water level transducers and data loggers shall be removed from wells scheduled for abandonment. As discussed in Section 1, after removal from a well this equipment shall be gently decontaminated, dried, stored in a clean plastic bag, and redeployed in a closure monitoring well. This activity shall be coordinated with the Water Programs Sampling Liaison.

If any well-like installations (such as lysimeters, vents, etc.) are discovered, they too shall be abandoned following consultation with and approval by the WARP Project Manager. These facilities are not included on the RFETS Master Well List. If found and confirmed to be no longer useful, they will be abandoned in the same manner and to the same requirements as monitoring wells.

Finally, although all wells in the Original Landfill area were scheduled for abandonment in 2004, the Original Landfill project required those wells to remain functional in case additional groundwater data are needed to support that project. Although that project will perform most of the labor and handle the wastes generated when abandoning these wells, when the project determines they may be abandoned, some support will be required from WARP personnel. In particular, support will be needed in the areas of providing well filling materials (bentonite and/or grout and sand) and documenting the abandonments, including preparing and submitting RFETS and State abandonment reports.

7.0 SCHEDULE, WASTE HANDLING, ORGANIZATION, AND ADMINISTRATIVE REQUIREMENTS

7.1 Schedule

All activities described in this WPA are scheduled to be completed in fiscal year 2005.

If possible, individual well abandonments should be scheduled in such a way that any required pre-abandonment sampling has been completed and data have been received and reviewed by Water Programs staff prior to initiating abandonment. In many cases this will not be feasible due to accelerated closure activities.

Some of the planned WARP activities identified in this WPA are subject to constraints imposed by other projects. Therefore, coordination with those projects is important. Table 7-1 provides some general schedule requirements where they are known (see also Sections 2.1 and 3.1). However, Table 7-1 should not be considered a firm or complete schedule, but rather as evidence of the need for the WARP to coordinate with other projects, and to be ready to accelerate or postpone activities in any area on short notice. It is expected that some of the projects identified in Table 7-1 will experience schedule changes that could accelerate or delay the associated WARP activities.

Table 7-1 WARP activities having external schedule requirements (This list is subject to change. See Sections 2.1 and 3.1 for more information.)

Well or Group of Wells	Planned WARP Activity	Requested Timing	Project/Driver
Wells around B776/777/779	Abandonment	By Feb. 7, 2005	B776/777 D&D
Wells along rail route to B371 and B776	Abandonment	By Feb. 22, 2005	B371/B776
Wells in pond dams	Abandonment	ASAP	Dam notching
2187, 3386	Abandonment	ASAP	Land configuration (FC-5)
Wells around B883	Abandonment	ASAP	B883
60799, 61399	Abandonment	ASAP	Patrol Road/700 Area
91104	Abandonment	ASAP	Oil Burn Pit #2 remediation
Wells around B444	Abandonment	ASAP	B444
Wells along FCs	Abandonment	ASAP	FC/final grading
Wells around B559	Abandonment	Late Jan./early Feb. 2005	B559
Wells in drainages	Abandonment	Postpone until April 1, 2005 (see Section 2.1)	IMP
Wells around B371/374	Abandonment	Spring 2005	B371
7086, P416689, and P416789	Abandonment	Postpone until WARP Project Manager instructs	Original Landfill
0487, 4787, 4887, 10992, 11092	Abandonment	Postpone until WARP Project Manager instructs	OU1 CAD/ROD
Wells supporting groundwater treatment systems	Abandonment	Postpone until WARP Project Manager instructs	IMP, decision documents
5887, 70393, 52894, 52994	Abandonment	Postpone until WARP Project Manager instructs	Present Landfill closure
Wells around the Ash Pits	Abandonment	Postpone until WARP Project Manager instructs	Closure of the Ash Pits
Wells around the 903 Pad	Abandonment	Postpone until WARP Project Manager instructs	ER
Replacement of well at Pond B-3 dam	Installation	Postpone until dam is notched, but before area is revegetated	Land configuration
Replacement of wells at B371	Installation	Postpone until land is graded, but before area is revegetated	B371
Replacement of wells along North Patrol Road and Sixth Street	Installation	Postpone until after FC-3 and FC-2 are graded and associated roads are removed	Land configuration

Well or Group of Wells	Planned WARP Activity	Requested Timing	Project/Driver
Replacement of wells around B444	Installation	Postpone until B444 demo and grading is complete, but before area is revegetated	B444
Replacement of wells at and east of B991	Installation	Postpone until B991 grading and FC-4 grading are complete, but before area is revegetated	B991/land configuration
Replacement of wells around B559	Installation	Postpone until B559 demo and area grading are complete, but before area is revegetated	B559

References to groups of wells in Table 7-1 (e.g., "wells around B444") only apply to those wells in that area that are a part of the WARP scope, as defined in this WPA. Any wells in that area that are not addressed in this WPA (i.e., not identified for abandonment or replacement) shall not be the focus of any WARP activities except at the direction of the WARP Project Manager. In all cases, the WARP crew shall coordinate and maintain communication with the associated project to ensure the activities are being performed in a timely manner.

Table 7-1 should not be viewed as complete, as other projects may be accelerated and require corresponding acceleration of WARP activities scheduled for that area. Finally, well replacements should be scheduled as soon as feasible, but in a time- and cost-efficient manner. The replacement wells should be sampled at least two months before the end of FY05, yet many cannot be installed until after areas are graded. Careful consideration will be required to balance these requirements and the additional costs to repeatedly mobilize/demobilize a drill rig and crew.

7.2 Waste Handling

Wastes generated through the abandonments performed in FY05 shall be managed in accordance with the guidelines set forth in Section 6 of the Well Abandonment and Replacement Program Work Plan (WARP-0206-WP). In general, well abandonment wastes will comprise three waste streams:

1. Fluids (groundwater, diluted grout, and decontamination and wash water);
2. Wellhead debris (stainless steel, steel, and PVC pipe; partial and whole concrete pads, potentially including wood forms used when pouring the pads); and
3. Field trash and PPE.

The fluid waste stream will be dominated by groundwater and decon/wash/rinse water. Fluids from this waste stream shall be containerized and delivered to the B891 Consolidated Water Treatment Facility (CWTF) for treatment/disposal. The CWTF Manager shall be notified prior to each delivery. Upon closure of the CWTF, alternative disposal methods will be determined.

The wellhead debris will typically be disposed as NRSW in a roll-off (upon approval by the Waste Characterization SME and Radiological Engineer), but may need to be disposed as low-level waste (LLW). Prior to removal from the well site, unless otherwise directed by the Waste Characterization SME and/or Radiological Engineer, these materials shall be thoroughly dry-brushed to remove all soil adhering to the pad (including the bottom of the pad) and the pipe (including portions that were below ground). In some cases, it may be possible to stage these wastes for disposal by another closure project working in the area. Opportunities such as this should be explored in advance whenever possible to save costs to the Site.

At the direction of the Waste Characterization SME and/or Radiological Engineer, the WARP field crew shall transport the wellhead debris to a designated NRSW roll-off container and gently place these wastes in the container. When full, the container will be emptied by the Sanitary and Special Waste Project. Prior to disposal at an approved offsite landfill, a Waste Release Evaluation, Sanitary Waste Disposal Waste Acceptance Criteria Form, and a Material Transfer and Disposition Form shall be delivered to the Sanitary

and Special Waste Project for review and approval. The Waste Characterization SME normally coordinates the activities and paperwork associated with emptying the container.

The WARP field crew shall incorporate the necessary radiological controls (typically a radiological survey of the wastes), place the wastes in the designated container(s), and provide timely updates on all waste handling and management activities to the Waste Characterization SME. The basis for these updates will be a log maintained by the WARP field crew that tracks movement of wastes from the field into the roll-off (and/or other designated containers). Updates shall include the former well designation; whether a radiological survey of the wastes is required, and if so, copies of the corresponding survey form(s); and advance notification when the roll-off approaches full capacity. Also included should be a general description of the wastes (for example, to clarify whether the debris from a given location includes a concrete pad, steel protective casing, and PVC well casing, or merely a ¼-inch polyethylene tube).

Pads and wellhead debris determined to be LLW by the Radiological Engineer shall be packaged into an appropriate container as per the requirements of the applicable Waste Generating Instruction (WGI). A qualified Waste Generator, Waste Inspector, and Radiological Control Technician (RCT) will perform the packaging of LLW. The Waste Generator will be responsible for coordinating the transfer of the LLW into the appropriate storage container and ensuring the documentation (Waste Traveler) for each waste container is complete and that the container is accurately accounted for in the Waste and Environmental Management System (WEMS).

In most cases, the field trash and PPE will be accumulated in small, clear trash bags and disposed in a separate, small waste container (dumpster) set aside for this type of NRSW. However, if these wastes are deemed by the Waste Characterization SME and Radiological Engineer to be LLW, alternate disposal means will be required. The Waste Characterization SME will arrange the disposal means for any such materials.

Well installations performed with a drill rig will generate a fourth waste stream, investigative-derived material (IDM) composed of soil cuttings. This IDM will be handled under the guidance of the Waste Characterization SME and in accordance with the RFCA Standard Operating Protocol (RSOP) for Asphalt and Soil Management, as set forth in the Soil Disturbance Permit that will apply to these well installations. The range of options includes spreading the soil on the ground or placing soil in drums and handling it as waste. It may be necessary to sample it first, then spread it or drum it depending on analytical results.

7.3 Organization

The organization chart under which the FY05 WARP will be implemented is shown on Figure 4.

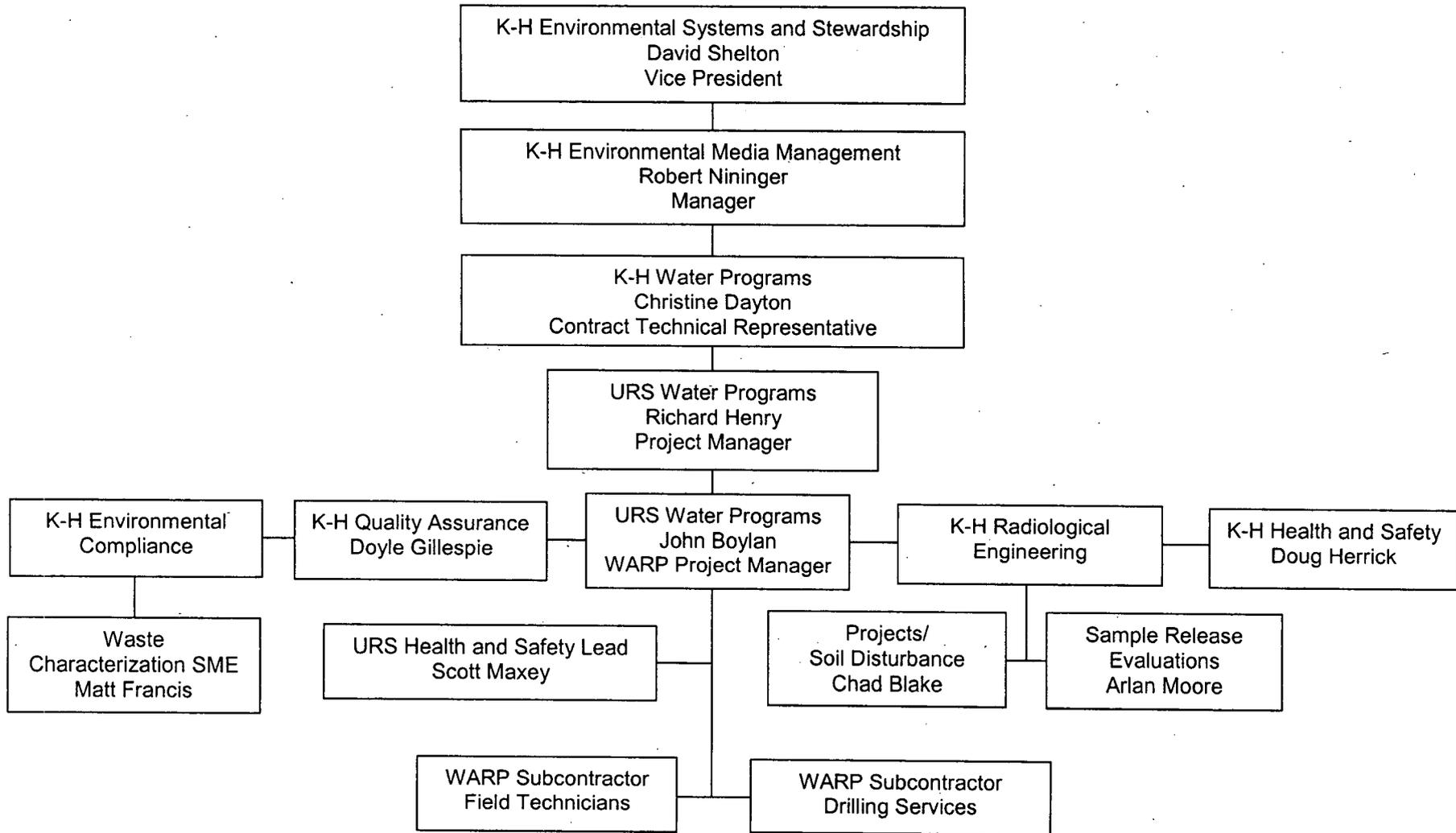
7.4 Administrative and Other Requirements

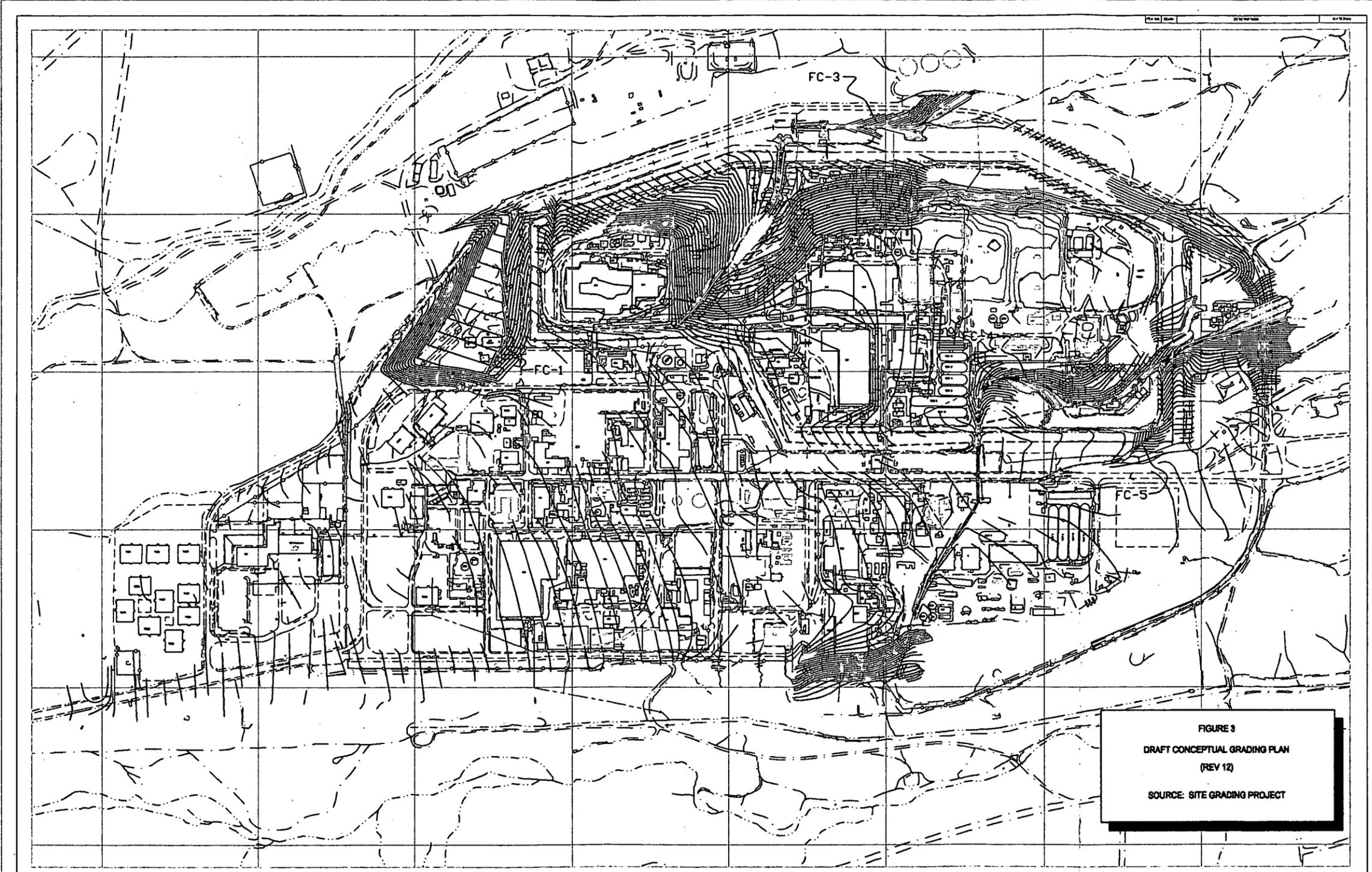
Documentation requirements are described in the WARP Work Plan (WARP-0206-WP) and various SOPs referenced therein, and include Well Abandonment Forms and the Colorado State Engineer Well Abandonment Reports, field logbooks, and other forms associated with well abandonment activities. Separate documentation requirements exist for intrusive activities (i.e., Geoprobings and drilling), well installation, and groundwater sampling activities, as described in the pertinent SOPs.

Additional pre-work requirements are also described in the WARP Work Plan, and include items such as obtaining Soil Disturbance Permits for intrusive work; conducting Plan of the Day schedules and meetings; conducting Pre-Evolution Briefings; notifying Site organizations such as Ecology, Security, and the Fire Department of any activities that may require their support; etc. Timely and appropriate coordination with other projects, in particular ER, D&D, and land configuration project will be particularly important.

All activities shall be conducted with constant attention to safety and quality. Each individual on the project has "stop work" authority: If unanticipated conditions are observed by a member of the project, or if safety issues are not resolved or addressed to the satisfaction of such an individual, they may pause the job. Upon such a pause, the field crew shall back off, communicate with the WARP Project Manager, and assess the condition or issue. Activities will not resume until all issues are satisfactorily resolved.

Figure 4: Water Programs WARP Organization Chart





NOTES:
 1. EXISTING CONTOURS OBTAINED FROM 1974 AERIAL PHOTOGRAPHIC SURVEY
 SUPERIMPOSED WITH FIELD SURVEY (ELEVATIONS OF FEET) USING
 TAPE IN APRIL 2008 (SEE DTS 51734-C600)
 2. PROPOSED GRADING FOR EXISTING PAVED AREA OBTAINED IN 2008
 USING FIELD SURVEY CONTOURS OBTAINED FROM AERIAL PHOTOGRAPHIC SURVEY
 SUPERIMPOSED WITH FIELD SURVEY (ELEVATIONS OF FEET) USING TAPE IN
 FEBRUARY 2008 (SEE DTS 51734-C600)

LEGEND:

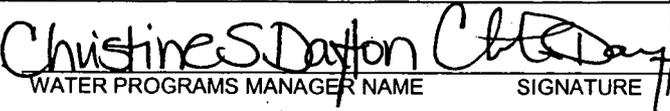
---	EXISTING CONTOUR
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---	PROPOSED GRAVEL
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---	PROPOSED SAND
---	EXISTING GRASS
---	PROPOSED GRASS
---	EXISTING BARE SOIL
---	PROPOSED BARE SOIL

DRAFT

12	DRAFT ISSUE/REVISED PROPOSED GRADE	5/20/08	51754-C600
KEYWORDS	CONCEPTUAL GRADING	CONCEPTUAL GRADING	CONCEPTUAL GRADING
ISSUE	CONCEPTUAL GRADING	CONCEPTUAL GRADING	CONCEPTUAL GRADING
DATE	5/20/08	5/20/08	5/20/08
BY	AS SHOWN	AS SHOWN	AS SHOWN
APP'D			
DATE			
SCALE			
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FY05 WARP Work Plan Addendum
Attachment 1 (March 3, 2005)

Sampling and Well Replacement in Rock Creek Area

Approved		Date: <u>3/3/05</u>
	WATER PROGRAMS MANAGER NAME SIGNATURE	

This Attachment to the FY05 WARP WPA provides for the replacement, development, and initial sampling of one well, and the collection of a corresponding set of samples from nearby Rock Creek. General requirements set forth in the FY05 WARP WPA and supporting documents apply to work performed through this Attachment. Specific instructions set forth in this Attachment supercede those in the WPA, which in turn supercede those in task-specific SOPs.

Background

In 2002, well 63895 was abandoned. This well was located in the Rock Creek drainage just south of Lindsay Ranch. It had been used to collect water level data, but analytical samples had never been collected. Prior to abandoning the well, one set of samples was collected. Results for VOCs showed concentrations of PCE above RFCA Tier II action levels (at 15.8 ug/L), and sub-Tier II concentrations of carbon tetrachloride (3.95 ug/L) and TCE (1.33 ug/L).

Historic surface water and sediment data from sampling locations SW005 and SED020, which were located on Rock Creek adjacent to well B102289, were inspected. These data are from the early 1990s, and show what appears to be spurious outliers rather than consistent or representative concentrations. Even so, some records show detections of VOCs including methylene chloride, PCE, TCE, and 1,2-DCE.

Intrusive investigations conducted in 2004 by ER on the terrace immediately south of 63895 did not reveal any potential contaminant sources, and groundwater sampling of wells generally upgradient of 63895 conducted in support of this ER investigation also showed no similar contamination.

As a result of these observations, there is some question of the reliability and representativeness of the analytical data from well 63895 and SW005. Therefore, well 63895 will be replaced and sampled, and Rock Creek surface water will be resampled.

Instruction: Well Replacement, Development, and Sampling

Well 63895 will be replaced using a Geoprobe to install a 1-in. diameter PVC well with above-ground protection. This well, which will be identified as 63805, will not be added to the IMP. This Attachment drives the installation, development, and collection of an initial set of samples. After that, the well will be sampled at the direction of the DOE. After sufficient data have been collected, well 63805 will be abandoned. Abandonment may be required before Site closure, in which case it will be identified in another Attachment to the FY05 WARP WPA. Alternatively, abandonment of 63805 may be postponed to after completion of the FY05 WARP, in which case responsibility for this activity will be defined by KH and/or DOE, as appropriate.

The following table provides the design for well 63805, but this design is subject to change according to observations by the Rig Geologist. In general, the objective is for well 63805 to have the same screened interval monitored by well 63895. However, if the bedrock contact is deeper than anticipated, or sandstone is intercepted in the shallow bedrock, the borehole will be advanced and the well deepened accordingly.

Former Well	Replacement Well	Bedrock Contact (Former Well)	Total Depth, (Former)/ Replacement Well	Top of Screened Interval, (Former)/ Replacement Well	Bottom of Screened Interval, (Former)/ Replacement Well	Diameter and Type of Replacement Well Components	Method of Replacement Well Installation
63895	63805	12	16.2 / 16.3	6.3 / 6.2	16.2 / 16.2	1 in., PVC	Geoprobe

Geologic core will be collected from ground surface to total depth, and will be logged in accordance with RMRS/OPS-PRO.101, Logging Alluvial and Bedrock Material. After the core log has been QC'ed, the core will be disposed to the ground and spread in the area immediately surrounding the well.

The location of well 63805 will be identified through three primary methods.

1. The coordinates for well 63895 will be used to mark the approximate location of this well. However, because the method by which well 63895 was originally located did not include surveying, these coordinates are approximate. The coordinates are: 2079749 easting, 752928 northing. (No surface elevation is included in the Well Master.)
2. Personnel who have visited well 63895 in the recent past will walk down the area in an attempt to refine the location identified above, and to search for traces of the abandoned well. The most likely traces will be bentonite at the ground surface, though these traces may no longer be evident due to the passage of time.
3. The original objective of well 63895 was related to investigations of the seeps at Rocky Flats. Some of these seeps or seep areas, including that targeted by well 63895, are evident from vegetation patterns along slopes, and coincide with the contact between the overlying Rocky Flats Alluvium and underlying bedrock. Well 63805 will target the same seep area targeted by well 63895.

It is hoped that these efforts will be successful so that the replacement well can be installed within 1-2 ft. of the location of former well 63895, in a side-gradient direction. While it may not be necessary to be this close to the former well location, it would be best to be as close as possible so that the groundwater monitored by well 63805 essentially duplicates that previously monitored by 63895.

Well 63805 will be developed as soon as feasible. Following completion of development activities, the Water Programs Sampling Liaison will be informed and the well will be scheduled for sampling as soon as possible. The analytical suite shall comprise VOCs. QC samples (duplicate and rinsate) shall also be collected. Requirements set forth in the corresponding task-specific SOPs, as modified by the FY05 WARP WPA where applicable, shall be followed in these activities.

If additional samples are desired after the initial samples have been collected and the data evaluated, they will be requested separately. This Attachment only drives the collection of the first set of samples.

Instruction: Surface Water Sampling

Grab samples shall be collected from Rock Creek at sampling location SW005. If the marker for this location is no longer present, the sample shall be collected from a point approximately 100 ft. upstream of the west side of the road crossing to Lindsay Ranch. Sampling shall generally coincide with groundwater sampling to the extent this is feasible. The analytical suite shall comprise VOCs. QC samples (duplicate and rinsate) shall also be collected. Requirements set forth in the corresponding task-specific SOPs shall be followed in this activity.

If additional samples are desired after the initial samples have been collected and the data evaluated, they will be requested separately. This Attachment only drives the collection of the first set of samples.

Documentation

Standard documentation shall be completed, including such records as a field logbook for well installation; core logs; and well development, groundwater sample collection, and surface water sample collection forms.

FY05 WARP Work Plan Addendum
Attachment 1 (March 3, 2005)

Sampling and Well Replacement in Rock Creek Area

Approved:	<u>Christina S. Dayton</u> WATER PROGRAMS MANAGER NAME	 SIGNATURE	Date: <u>3/3/05</u>
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This Attachment to the FY05 WARP WPA provides for the replacement, development, and initial sampling of one well, and the collection of a corresponding set of samples from nearby Rock Creek. General requirements set forth in the FY05 WARP WPA and supporting documents apply to work performed through this Attachment. Specific instructions set forth in this Attachment supercede those in the WPA, which in turn supercede those in task-specific SOPs.

Background

In 2002, well 63895 was abandoned. This well was located in the Rock Creek drainage just south of Lindsay Ranch. It had been used to collect water level data, but analytical samples had never been collected. Prior to abandoning the well, one set of samples was collected. Results for VOCs showed concentrations of PCE above RFCA Tier II action levels (at 15.8 ug/L), and sub-Tier II concentrations of carbon tetrachloride (3.95 ug/L) and TCE (1.33 ug/L).

Historic surface water and sediment data from sampling locations SW005 and SED020, which were located on Rock Creek adjacent to well B102289, were inspected. These data are from the early 1990s, and show what appears to be spurious outliers rather than consistent or representative concentrations. Even so, some records show detections of VOCs including methylene chloride, PCE, TCE, and 1,2-DCE.

Intrusive investigations conducted in 2004 by ER on the terrace immediately south of 63895 did not reveal any potential contaminant sources, and groundwater sampling of wells generally upgradient of 63895 conducted in support of this ER investigation also showed no similar contamination.

As a result of these observations, there is some question of the reliability and representativeness of the analytical data from well 63895 and SW005. Therefore, well 63895 will be replaced and sampled, and Rock Creek surface water will be resampled.

Instruction: Well Replacement, Development, and Sampling

Well 63895 will be replaced using a Geoprobe to install a 1-in. diameter PVC well with above-ground protection. This well, which will be identified as 63805, will not be added to the IMP. This Attachment drives the installation, development, and collection of an initial set of samples. After that, the well will be sampled at the direction of the DOE. After sufficient data have been collected, well 63805 will be abandoned. Abandonment may be required before Site closure, in which case it will be identified in another Attachment to the FY05 WARP WPA. Alternatively, abandonment of 63805 may be postponed to after completion of the FY05 WARP, in which case responsibility for this activity will be defined by KH and/or DOE, as appropriate.

The following table provides the design for well 63805, but this design is subject to change according to observations by the Rig Geologist. In general, the objective is for well 63805 to have the same screened interval monitored by well 63895. However, if the bedrock contact is deeper than anticipated, or sandstone is intercepted in the shallow bedrock, the borehole will be advanced and the well deepened accordingly.

Former Well	Replacement Well	Bedrock Contact (Former Well)	Total Depth, (Former)/ Replacement Well	Top of Screened Interval, (Former)/ Replacement Well	Bottom of Screened Interval, (Former)/ Replacement Well	Diameter and Type of Replacement Well Components	Method of Replacement Well Installation
63895	63805	12	16.2 / 16.3	6.3 / 6.2	16.2 / 16.2	1 in., PVC	Geoprobe

Geologic core will be collected from ground surface to total depth, and will be logged in accordance with RMRS/OPS-PRO.101, Logging Alluvial and Bedrock Material. After the core log has been QC'ed, the core will be disposed to the ground and spread in the area immediately surrounding the well.

The location of well 63805 will be identified through three primary methods.

1. The coordinates for well 63895 will be used to mark the approximate location of this well. However, because the method by which well 63895 was originally located did not include surveying, these coordinates are approximate. The coordinates are: 2079749 easting, 752928 northing. (No surface elevation is included in the Well Master.)
2. Personnel who have visited well 63895 in the recent past will walk down the area in an attempt to refine the location identified above, and to search for traces of the abandoned well. The most likely traces will be bentonite at the ground surface, though these traces may no longer be evident due to the passage of time.
3. The original objective of well 63895 was related to investigations of the seeps at Rocky Flats. Some of these seeps or seep areas, including that targeted by well 63895, are evident from vegetation patterns along slopes, and coincide with the contact between the overlying Rocky Flats Alluvium and underlying bedrock. Well 63805 will target the same seep area targeted by well 63895.

It is hoped that these efforts will be successful so that the replacement well can be installed within 1-2 ft. of the location of former well 63895, in a side-gradient direction. While it may not be necessary to be this close to the former well location, it would be best to be as close as possible so that the groundwater monitored by well 63805 essentially duplicates that previously monitored by 63895.

Well 63805 will be developed as soon as feasible. Following completion of development activities, the Water Programs Sampling Liaison will be informed and the well will be scheduled for sampling as soon as possible. The analytical suite shall comprise VOCs. QC samples (duplicate and rinsate) shall also be collected. Requirements set forth in the corresponding task-specific SOPs, as modified by the FY05 WARP WPA where applicable, shall be followed in these activities.

If additional samples are desired after the initial samples have been collected and the data evaluated, they will be requested separately. This Attachment only drives the collection of the first set of samples.

Instruction: Surface Water Sampling

Grab samples shall be collected from Rock Creek at sampling location SW005. If the marker for this location is no longer present, the sample shall be collected from a point approximately 100 ft. upstream of the west side of the road crossing to Lindsay Ranch. Sampling shall generally coincide with groundwater sampling to the extent this is feasible. The analytical suite shall comprise VOCs. QC samples (duplicate and rinsate) shall also be collected. Requirements set forth in the corresponding task-specific SOPs shall be followed in this activity.

If additional samples are desired after the initial samples have been collected and the data evaluated, they will be requested separately. This Attachment only drives the collection of the first set of samples.

Documentation

Standard documentation shall be completed, including such records as a field logbook for well installation; core logs; and well development, groundwater sample collection, and surface water sample collection forms.

Sector 2a WRW Exceedances and NLR Status

KEY

- WRW Exceedance
- Greater than background or detect
- Less than background or nondetect
- ▭ Sectors
- ▭ IHSS
- ▭ UBC
- ▭ PAC

Location	Analyte	Result	Wrw	Background	Unit	Startdepth	Enddepth	Remediated
SS001993	Vanadium	11300.0	7150.0	45.59	mg/kg	0.0	0.25	No

Location	Analyte	Result	Wrw	Background	Unit	Startdepth	Enddepth	Remediated
SS001093	Vanadium	43400.0	7150.0	45.59	mg/kg	0.0	0.25	No

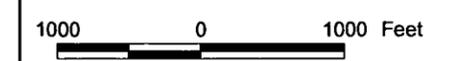
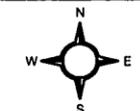
Location	Analyte	Result	Wrw	Background	Unit	Startdepth	Enddepth	Remediated
493	Arsenic	23.8	22.2	13.14	mg/kg	7.4	7.60	No

Location	Analyte	Result	Wrw	Background	Unit	Startdepth	Enddepth	Remediated
65292	Uranium-234	971.0	300.0	2.64	pCi/g	0.0	2.00	No

Sector 2a

Numerous Exceedances in PAC NW-1505 See Table

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Scale = 1: 15500

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

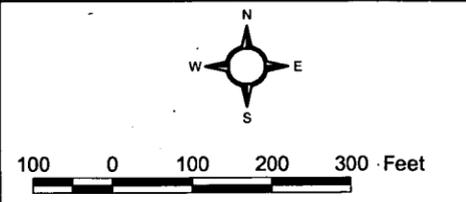
Prepared by: **RADMS**

Prepared for: **KAISER HILL COMPANY**

Sector 7A WRW Exceedances and NLR Status

KEY

- Soil sampling location with WRW exceedance
- Soil or sediment sampling location with results <WRW AL but >RL (organics) and > background means plus two standard deviations (inorganics)
- Sampling location with all results <RL and background means plus two standard deviations
- Dirt roads
- Paved roads
- ~ Streams
- Lakes
- Building**
- ▨ Demolished
- Standing
- IHSS
- PAC
- UBC
- ▭ Sector boundary

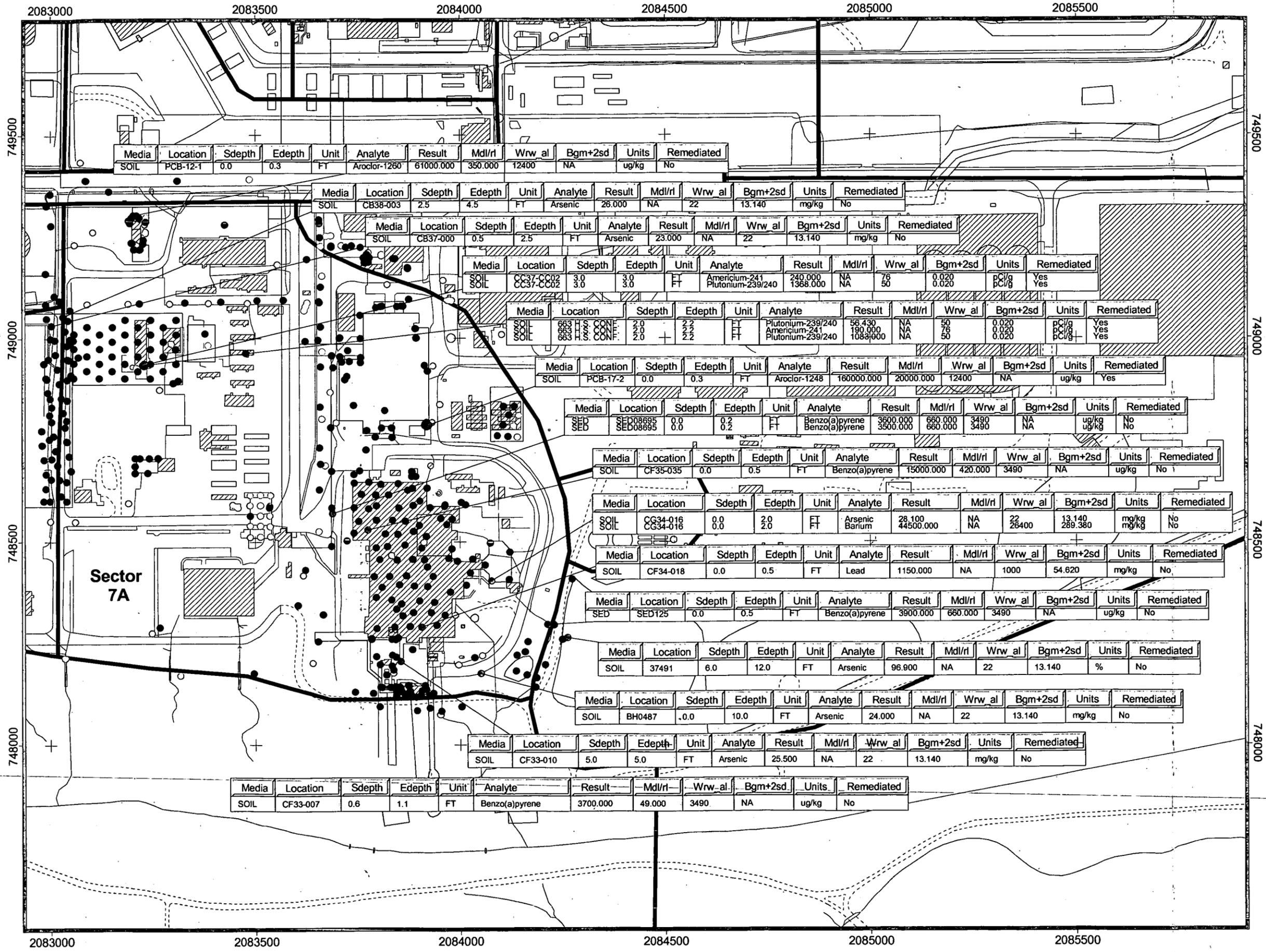


State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: **RADMS**

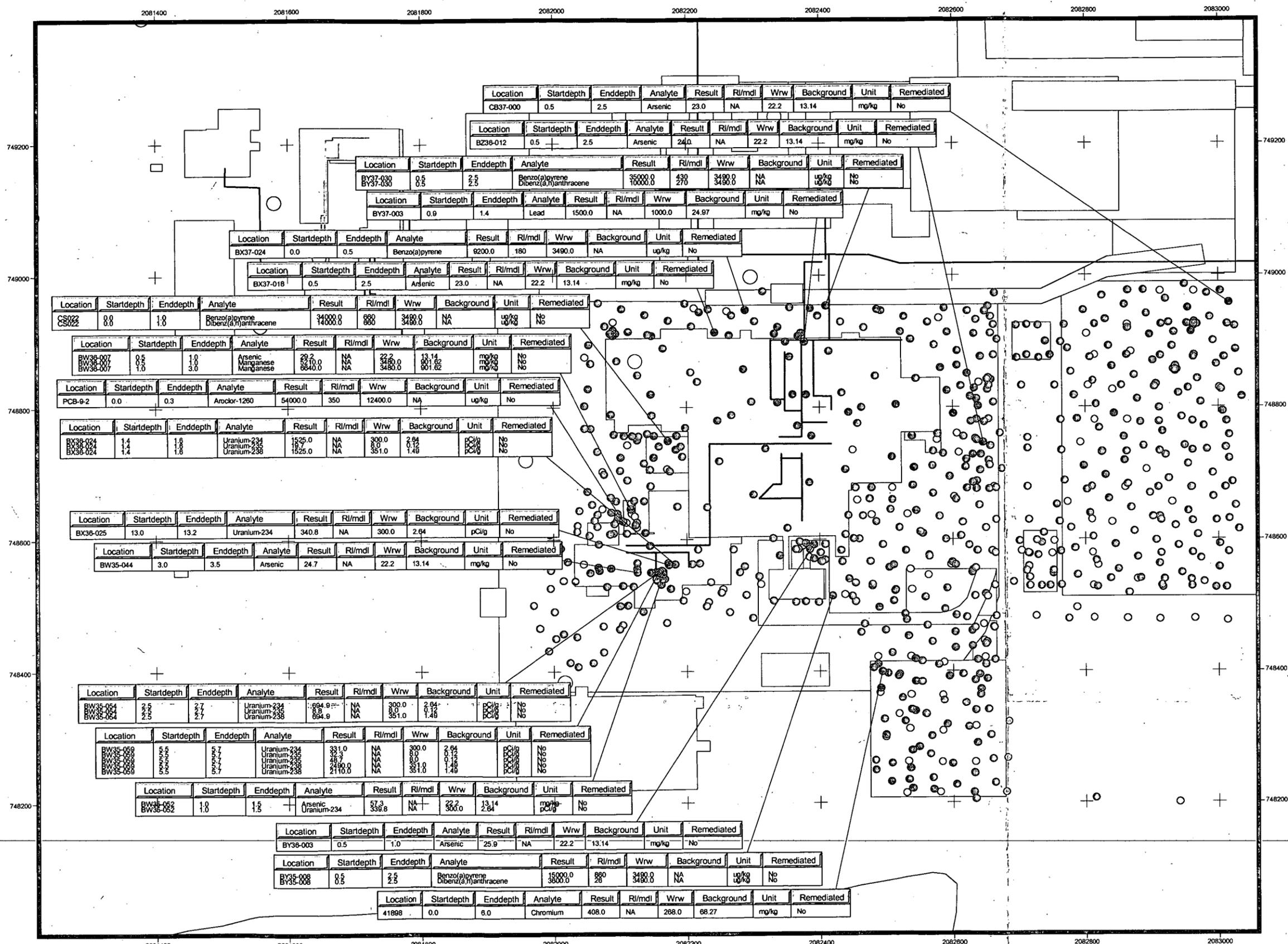
Prepared for:
**KAISER HILL
COMPANY**



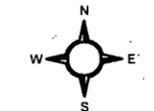
**Sector 8b
WRW Exceedances
and Remediation Status**

KEY

- WRW Exceedance
 - Greater than background or detect
 - Less than background or nondetect
- Sector Boundary
 PAC
 UBC
 IHSS
- Buildings**
- Demolished
 - Standing
- NPWL**
- Removed
 - In Progress
 - Clean - Closed (Remain in Place)
 - Above Ground - Removed
 - OPWL



DRAFT



100 0 100 Feet

Scale = 1: 1850

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 02.24.05

Prepared by:



Prepared for:



FY05 WARP Work Plan Addendum
Attachment 4 (July 26, 2005)

Adjustments in Scope:
903 Pad/Ryan's Pit Plume, Rock Creek, and
Groundwater Treatment System Areas

Approved:	<u>Christine Dayton</u> WATER PROGRAMS MANAGER NAME	Date: <u>8/1/05</u>	<u>Christine Dayton</u> SIGNATURE
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This Attachment to the FY05 WARP WPA adjusts the scope set forth in the FY05 WARP WPA. Thirty-eight scheduled well abandonments are cancelled, one well previously scheduled to remain in place at Site closure will be abandoned, and two wells that were recently rediscovered will be abandoned. (The term "well" also refers to piezometers.) In addition, one recently-installed well that would have been scheduled for abandonment will be retained. General requirements set forth in the FY05 WARP WPA and supporting documents apply to work performed through this Attachment. Specific instructions set forth in this Attachment supercede those in the WPA, which in turn supercede those in task-specific SOPs.

Background and Discussion

- Conclusions reached in the Groundwater IM/IRA and negotiations with the CDPHE and EPA call for the addition of an in-situ soil amendment to enhance biodegradation of a VOC plume near its source at the 903 Pad. The effect of this activity on the groundwater plume will be monitored. The two wells selected for this purpose had previously been scheduled for abandonment, but will now be retained in the monitoring network. As a result of their addition to the network, another well farther downgradient will be removed from the network and abandoned.
- The abandonment of six wells in the Rock Creek area, as set forth in the FY05 WARP WPA, will be cancelled. Another well, installed in a seep area on the southern slope of the Rock Creek drainage in 2005 as part of a special well replacement and sampling effort (see FY05 WARP WPA Attachment 1) will not be abandoned. These seven wells will remain in place and be transferred to the US Fish and Wildlife Service (FWS) to support efforts related to water rights in the Rock Creek drainage.
- The FY05 WARP WPA was designed to provide for the abandonment of all wells that were not in the FY05 IMP. However, issuance of the WPA preceded that of the IMP. As the FY05 IMP was being finalized by the Groundwater IMP Working Group, as reflected in the FY05 WARP WPA, the expectation was that four existing decision documents would be modified to reflect reductions in monitoring that were being recommended. (These documents refer to groundwater monitoring at the three groundwater treatment facilities and the OU1 Plume.) It was later decided that the decision documents would not be modified prior to Site closure. As a result, those wells recommended for removal from the monitoring network were added back into the network as defined by the FY05 IMP, and their abandonment per the FY05 WARP WPA must be cancelled.
- Plans to notch the dams at several ponds have been cancelled. Wells installed in the dams that were to have been notched were originally scheduled for abandonment (and replacement, in one case). With the decision to leave the dams intact, abandonment of the wells is no longer desired, and the well replacement is no longer necessary.
- Two wells that have previously been listed as abandoned have been rediscovered and will be abandoned. In one case, the well was assigned erroneous coordinates (approximately 750 feet away from its actual location) so that attempts to locate it led to the conclusion that it had already been abandoned. In another, the well was listed as abandoned for no known reason. Both of these wells will be properly abandoned.

PADC-2005-00016

CONTROLLED DOCUMENT
(If numbered in red ink-black numbering indicates information only copy)

4
Copy Number

Instruction: Well Abandonments

The table below lists the wells to which this Attachment applies, and defines the disposition of each well. Activities (such as permitting) associated with the actual transfer of wells to the FWS will not be performed under the WARP.

Well	Location	Disposition
00191	903 Pad area	Retain: Will be added to IMP as Evaluation well
0487	881 Hillside	Retain: Decision document will not be modified before Site closure
1190	N Buffer Zone	Retain: To be transferred to DOE/FWS
1786	Solar Pond Plume	Retain: Decision document will not be modified before Site closure
3586	N of Mound Plume	Retain: Decision document will not be modified before Site closure
4786	NW Buffer Zone	Retain: To be transferred to DOE/FWS
4787	881 Hillside	Retain: Decision document will not be modified before Site closure
4887	881 Hillside	Retain: Decision document will not be modified before Site closure
10992	881 Hillside	Retain: Decision document will not be modified before Site closure
11092	881 Hillside	Retain: Decision document will not be modified before Site closure
11494	W Buffer Zone	Retain: To be transferred to DOE/FWS
15199	MSPTS	Retain: Decision document will not be modified before Site closure
15299	MSPTS	Retain: Decision document will not be modified before Site closure
15399	MSPTS	Retain: Decision document will not be modified before Site closure
15499	MSPTS	Retain: Decision document will not be modified before Site closure
15599	MSPTS	Retain: Decision document will not be modified before Site closure
15799	MSPTS	Retain: Decision document will not be modified before Site closure
16199	MSPTS	Retain: Decision document will not be modified before Site closure
16299	MSPTS	Retain: Decision document will not be modified before Site closure
16399	MSPTS	Retain: Decision document will not be modified before Site closure
16499	MSPTS	Retain: Decision document will not be modified before Site closure
16599	MSPTS	Retain: Decision document will not be modified before Site closure
20696 20270	NW Buffer Zone	Retain: To be transferred to DOE/FWS
23305	Pond B-3 dam area	Cancel installation: Was to replace TH46992 after dam notching
63805	Rock Creek	Retain: To be transferred to DOE/FWS
70099	SPPTS	Retain: Decision document will not be modified before Site closure
70799	SPPTS	Retain: Decision document will not be modified before Site closure
70899	SPPTS	Retain: Decision document will not be modified before Site closure
70999	SPPTS	Retain: Decision document will not be modified before Site closure
71099	SPPTS	Retain: Decision document will not be modified before Site closure
90402	903 Pad area	Retain: Will be added to IMP as Evaluation well
90703	903 Pad/Ryan's Pit Plume	Abandon: Inclusion of 00191 and 90402 renders well unnecessary
95699	ETPTS	Retain: Decision document will not be modified before Site closure
95799	ETPTS	Retain: Decision document will not be modified before Site closure
95899	ETPTS	Retain: Decision document will not be modified before Site closure
B200589	N Buffer Zone	Retain: To be transferred to DOE/FWS
B200889	NE Buffer Zone	Retain: To be transferred to DOE/FWS
P209989	SPPTS <i>6/29 done</i>	Abandon: Unnecessary, erroneously listed as already abandoned
P219989	903 Pad area <i>3/16 done</i>	Abandon: Previously assumed abandoned due to inaccurate coordinates
TH046592	Pond B-1 dam	Retain: Pond B-1 dam will not be notched
TH046792	Pond B-1 dam	Retain: Pond B-1 dam will not be notched
TH046992	Pond B-3 dam	Retain: Pond B-3 dam will not be notched, no need to replace
TH047092	Pond B-3 dam	Retain: Pond B-3 dam will not be notched

Documentation

Standard documentation shall be completed where appropriate, including but not limited to such records as a field logbook and well abandonment form(s) for well abandonments.

**FY05 WARP Work Plan Addendum
Attachment 5 (August 3, 2005)**

Well Replacements at the Original Landfill

Approved:	<u>Robert C. Ninninger</u>	<u>Robert C. Ninninger</u>	Date: <u>8/3/05</u>
	WATER PROGRAMS MANAGER NAME	SIGNATURE	

This Attachment to the FY05 WARP WPA provides for the installation of three wells at the Original Landfill (OLF). General requirements set forth in the FY05 WARP WPA and supporting documents apply to work performed through this Attachment. Specific instructions set forth in this Attachment supercede those in the WPA, which in turn supercede those in task-specific SOPs.

Background

The OLF was active from 1950 until 1968. It was then studied as part of the OU5 characterization activities of the 1990s. This included the installation and sampling of numerous wells, well points, and piezometers (henceforth collectively referred to as wells) to support the evaluation of groundwater in this area. In 2004, these wells were scheduled for abandonment. All wells at the OLF have since been abandoned and this facility has been undergoing closure activities.

Groundwater monitoring at the OLF will be required at one existing upgradient well and three downgradient replacement wells. This WPA Attachment provides for the installation of the replacement wells. Appropriate well locations were selected in coordination with the regulators and project representatives, and were defined by now-abandoned wells 60493, 7086, and 62793. These locations were adjusted following regrading that was performed as a part of OLF closure.

Instruction: Well Replacement

The objective of the three replacement wells is to monitor groundwater downgradient of the OLF within the colluvium, any fill that may be present, and the uppermost weathered bedrock. The total depth of each well will be deep enough to allow ample storage capacity in the well. If an interval of sandstone or saturated siltstone is intercepted, the borehole will be advanced so that the well screens this material.

The Rig Geologist will carefully inspect the core for signs of fracturing, both because of the potential for fractures to act as preferential pathways for groundwater and because of inferred faults that have been mapped as extending through the OLF area, particularly the western portion of the OLF (Geologic Characterization Report, EG&G 1995). If heavy fracturing indicative of faulting is observed, the Rig Geologist shall contact the WARP project manager immediately and describe the observations. Discussions with the Original Landfill project manager will ensue, and may require changes to the well location and/or design. At a minimum, the borehole will likely be advanced to ensure the well screens the fracture zone.

Well designs and locations are proposed in the table below. Each will be installed using a drill rig employing hollow-stem auger methods. The actual well design shall be adjusted as necessary by the Rig Geologist. Depth to bedrock is uncertain due to the disturbed nature of the area, but should be fairly shallow (less than 20 ft. bgs). Each well shall be completed with above-ground protective casing, which shall not be allowed to compromise the integrity of the bentonite seal. The filter pack shall not extend above 4 ft. bgs.

Prior to initiating intrusive work, the proposed well locations will be flagged and reviewed by the OLF project manager or designee. Intrusive activities will not begin until the locations are accepted or revised accordingly. This process and the results will be documented in the Rig Geologist's field logbook.

Geologic core shall be collected from ground surface to total depth, and will be logged in accordance with RMRS/OPS-PRO.101, Logging Alluvial and Bedrock Material. After the core log has been QC'ed, the core will be disposed to the ground and spread in the area immediately surrounding the well unless directed otherwise by the OLF project.

Well	Bedrock Contact (ft. bgs)	Total Depth (ft. bgs)	Top of Screened Interval (ft. bgs)	Diameter and Type of Well Components	Location Coordinates (State Planar)	
					Northing	Easting
80005	10	20	5	2" PVC	747491.07	2081405.35
80105	8	20	5	2" PVC	747463.17	2081941.09
80205	10	20	5	2" PVC	747535.70	2082349.46

Each of these wells will be developed as soon as feasible. Following completion of development activities, the Water Programs Sampling Liaison will be informed and the four wells (three downgradient wells identified above, and one existing upgradient well, identified as P416589) will be scheduled for sampling as soon as possible. Sampling frequency shall be quarterly, and shall be coordinated to the extent possible with associated OLF-specific surface water sampling. Requirements set forth in the corresponding task-specific SOPs, as modified by the FY05 WARP WPA where applicable, shall be followed in these activities. The analytical suite for all four wells shall include VOCs, SVOCs, metals, and pesticides using methods of sample collection and analysis that are consistent with those used at other routinely-sampled wells. (Analytical methods and turnaround times for SVOCs and pesticides will be selected to support Original Landfill monitoring objectives.)

Documentation

Well installations will employ the existing Soil Disturbance Permit for the OLF activities.

Standard documentation shall be completed, including such records as a field logbook for well installation; daily drill rig inspection forms; core logs; and well development and groundwater sample collection forms. The Daily Field Drilling Activities Report (form PRO.114A) need not be completed.

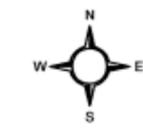
IA-A-002983

Sector 5b WRW Exceedances and Remediation Status

KEY

- WRW Exceedance
 - Greater than background or detect
 - Less than background or nondetect
- Sector Boundary
 PAC
 UBC
 IHSS
- Buildings**
- Demolished
 - Standing
- NPWL**
- Removed
 - In Progress
 - Clean - Closed (Remain in Place)
 - Above Ground - Removed
 - OPWL
 - Paved road

DRAFT



150 0 150 Feet

Scale 1: 1450

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 03.01.05

Prepared by:

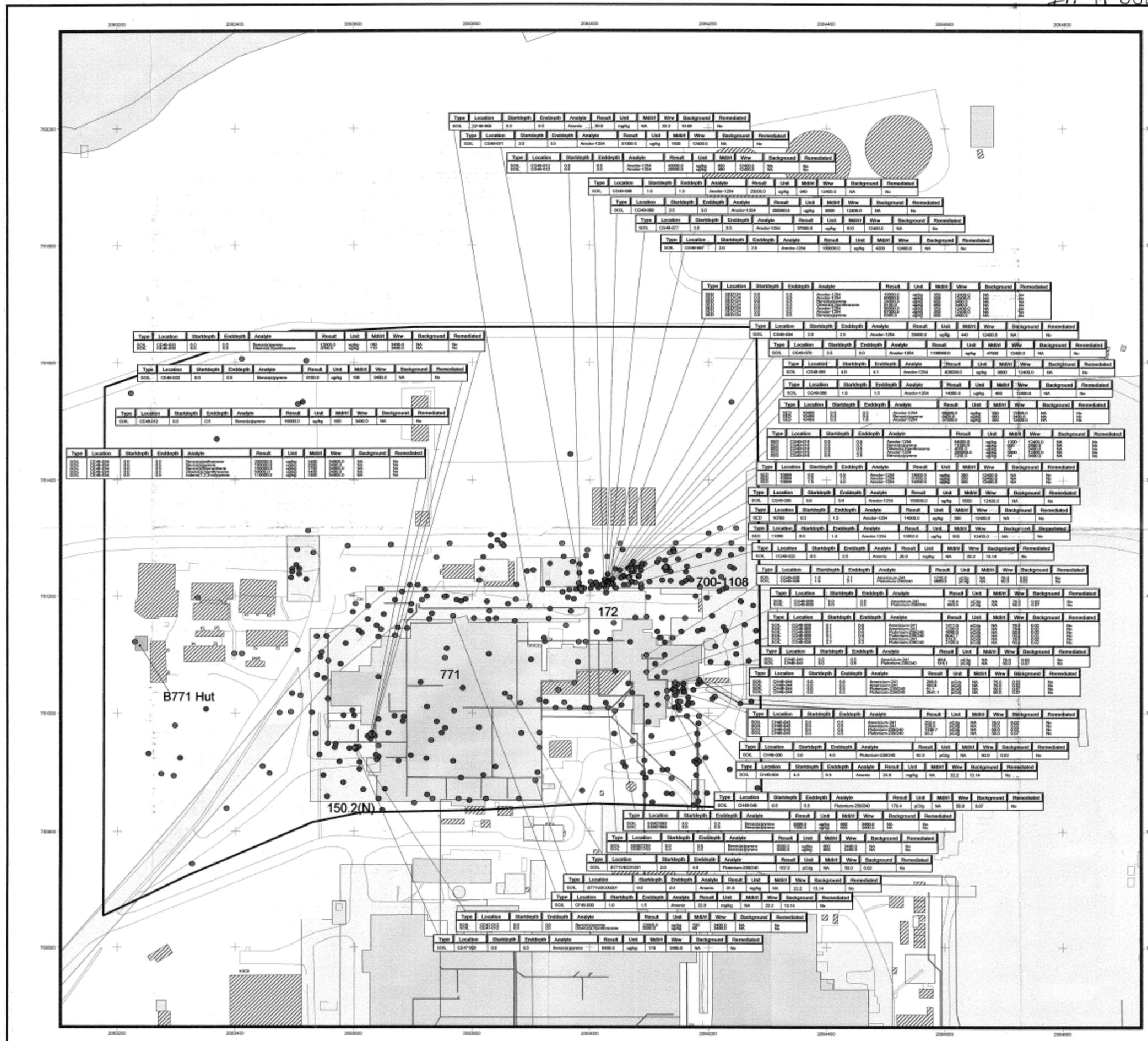


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ESB200-H-11



Type	Location	Startdepth	Enddepth	Analyte	Result	Unit	M&M	Ww	Background	Remediated
SOIL	CE48-000	0.0	0.5	Arsenic	30.0	mg/kg	NA	22.2	10.00	No
SOIL	CE48-001	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-002	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-003	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-004	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-005	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-006	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-007	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-008	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-009	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-010	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-011	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-012	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-013	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-014	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-015	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-016	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-017	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-018	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-019	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-020	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-021	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-022	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-023	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-024	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-025	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-026	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-027	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-028	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-029	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-030	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-031	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-032	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-033	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-034	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-035	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-036	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-037	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-038	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-039	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-040	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-041	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-042	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-043	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-044	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-045	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-046	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-047	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-048	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-049	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-050	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-051	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-052	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-053	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-054	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-055	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-056	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-057	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-058	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-059	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-060	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-061	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-062	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-063	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-064	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-065	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-066	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-067	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-068	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-069	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-070	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-071	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-072	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-073	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-074	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-075	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-076	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-077	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-078	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-079	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-080	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-081	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-082	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-083	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-084	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-085	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-086	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-087	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-088	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-089	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-090	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-091	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-092	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-093	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-094	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-095	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-096	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-097	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-098	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-099	0.0	0.5	Arsenic	12.0	mg/kg	NA	12.0	10.00	No
SOIL	CE48-100	0.0	0.5	Arsenic						

Figure 4
Well Replacements
FY05 WARP
Work Plan Addendum

Legend

- Replacement well
 - FY05 IMP well
- Standard Map Features**
- Building or structure
 - Groundwater treatment system
 - Lake or pond
 - Stream, ditch, or other drainage feature
 - Paved road
 - Dirt road
 - Trail
 - Fence
 - Topographic contour (20 feet)

Definitely need to install these

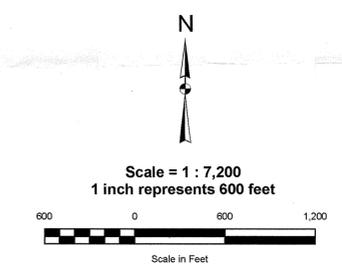
May need to install some of these also - see Note 1 below.

Notes:

1) Other members of the closure network may need to be replaced. The balance of that network is shown for this purpose; the well identification number assigned to any additional well replacement will be determined when the need for that replacement is confirmed.

2) Groundwater in the Present Landfill and Original Landfill areas will be monitored. The specific wells will be defined in their RFCA Decision Documents. Wells shown in these areas are potential candidates for this monitoring. The final well selection in these areas will be added to future versions of this map when feasible.

IA-A-002983



State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: **URS**

Prepared for: **ICM**

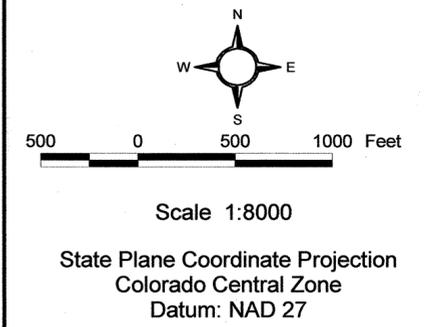
March 3, 2006

NT_Srv_WpProjects\FY05\05-0016\FY05 WARP WPA Fig 4.mxd

Sector 3B WRW Exceedences and NLR Status

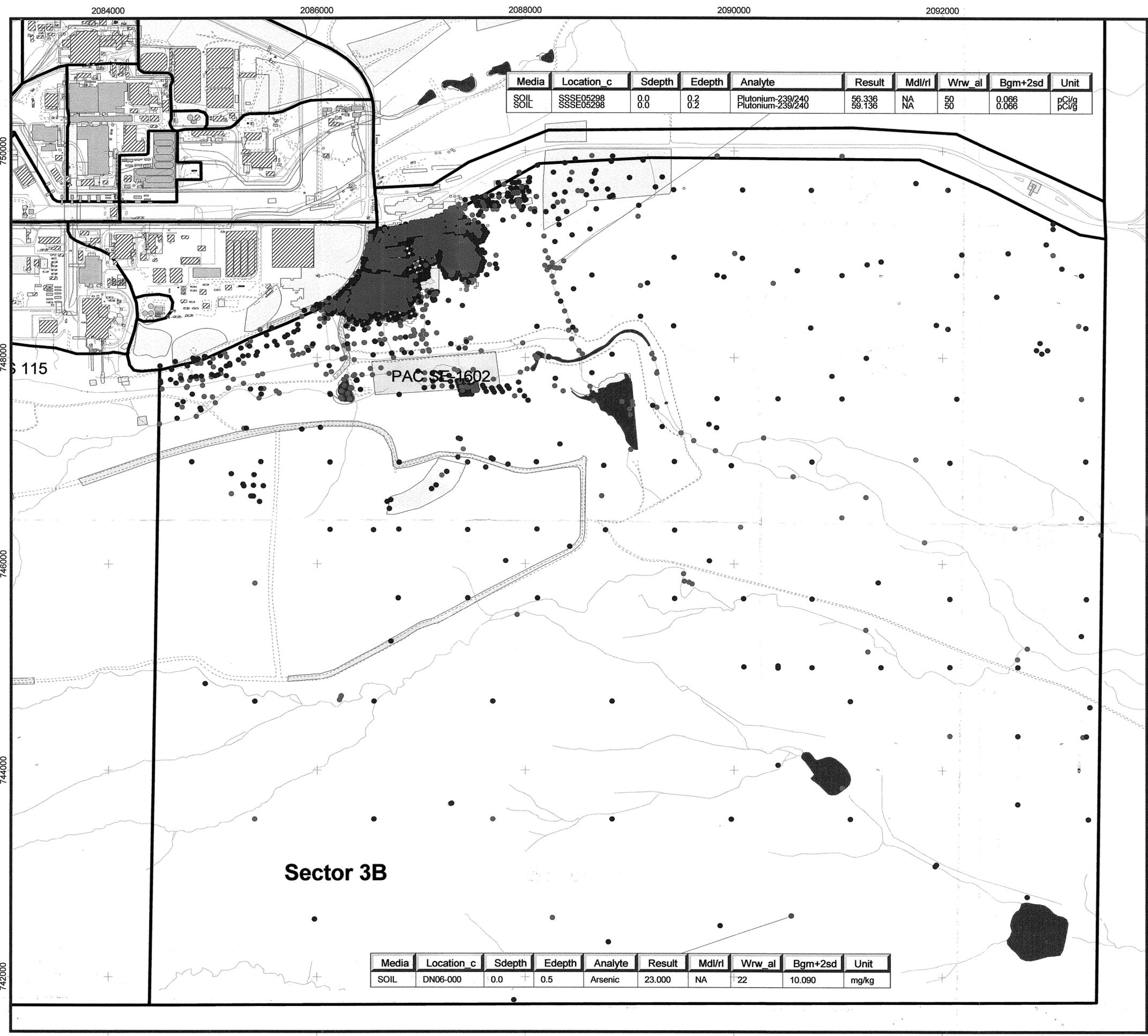
KEY

- Soil sampling location with WRW exceedance
- Soil or sediment sampling location with results <WRW AL but >RL (organics) and > background means plus two standard deviations (inorganics)
- Sampling location with all results <RL and background means plus two standard deviations
- ~ Dirt roads
- ~ Paved roads
- ~ Streams
- Lakes
- Building**
- ▨ Demolished
- Standing
- IHSS
- PAC
- UBC
- Sector boundary



U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: **RADMS**
Prepared for: **KAISER HILL COMPANY**



Media	Location_c	Sdepth	Edepth	Analyte	Result	Mdl/rl	Wrw_al	Bgm+2sd	Unit
SOIL	SSSE05298	0.0	0.2	Plutonium-239/240	56.336	NA	50	0.066	pCi/g
SOIL	SSSE05298	0.0	0.2	Plutonium-239/240	59.136	NA	50	0.066	pCi/g

Media	Location_c	Sdepth	Edepth	Analyte	Result	Mdl/rl	Wrw_al	Bgm+2sd	Unit
SOIL	DN06-000	0.0	0.5	Arsenic	23.000	NA	22	10.090	mg/kg

Figure 1
Abandonments in the
Buffer Zone
FY05 WARP
Work Plan Addendum

Legend

- ◇ Well scheduled for pre-abandonment sampling
- Well scheduled to be abandoned
- FY05 IMP well

Standard Map Features

- Building or structure
- Groundwater treatment system
- Lake or pond
- Stream, ditch, or other drainage feature
- Paved road
- Dirt road
- Trail
- Fence
- Topographic contour (20 foot)

Notes:

- 1) IMP wells that are to be replaced may need to be sampled before they are abandoned, if the replacement well cannot be installed in time for the next scheduled sampling round. Coordinate these abandonments with the WARP Project Manager and Water Programs Sampling Liason.
- 2) Groundwater in the Present Landfill and Original Landfill areas will be monitored. The specific wells will be defined in their RFCA Decision Documents. Wells shown in these areas are potential candidates for this monitoring. The final well selection in these areas will be added to future versions of this map when feasible.

Handwritten notes:
3899/
3099/
3239/
3859/
5587
Warp - pl
Warp

N

Scale = 1 : 9,600
1 inch represents 800 feet

Scale in Feet

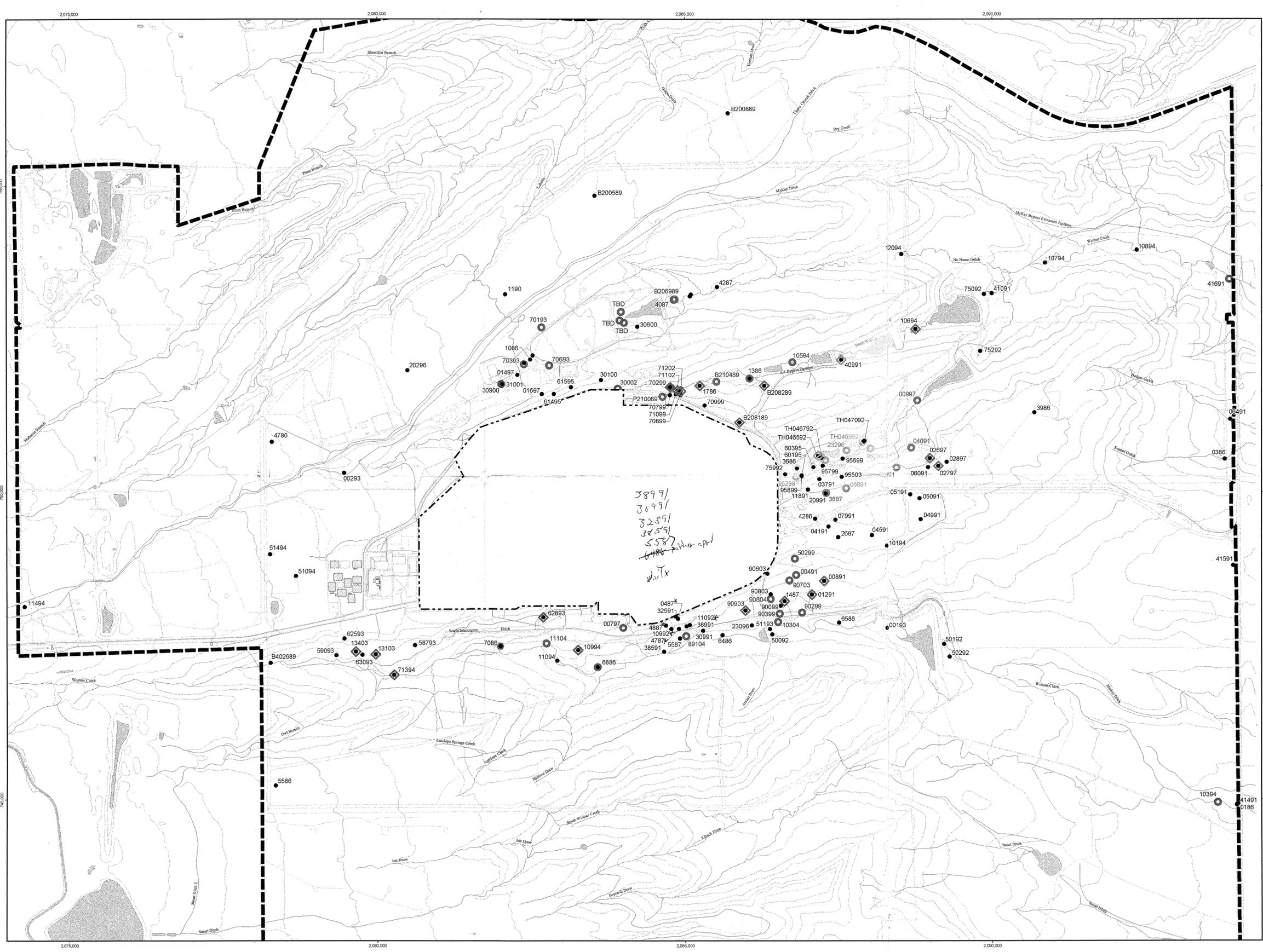
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:

February 10, 2005

MT_Srv_W:\Projects\FY2005-0018\FY05 WARP WPA Fig 1.mxd

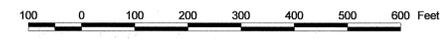
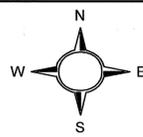


Sector 6A WRW Exceedences and NLR Status

KEY

- Soil sampling location with WRW exceedance
- Soil or sediment sampling location with results <WRW AL but >RL (organics) and > background means plus two standard deviations (inorganics)
- Sampling location with all results <RL and background means plus two standard deviations

- ~ Dirt roads
- ~ Paved roads
- ~ Streams
- Lakes
- Building
- ▨ Demolished
- Standing
- IHSS
- PAC
- UBC
- Sector boundary



Scale 1:2000

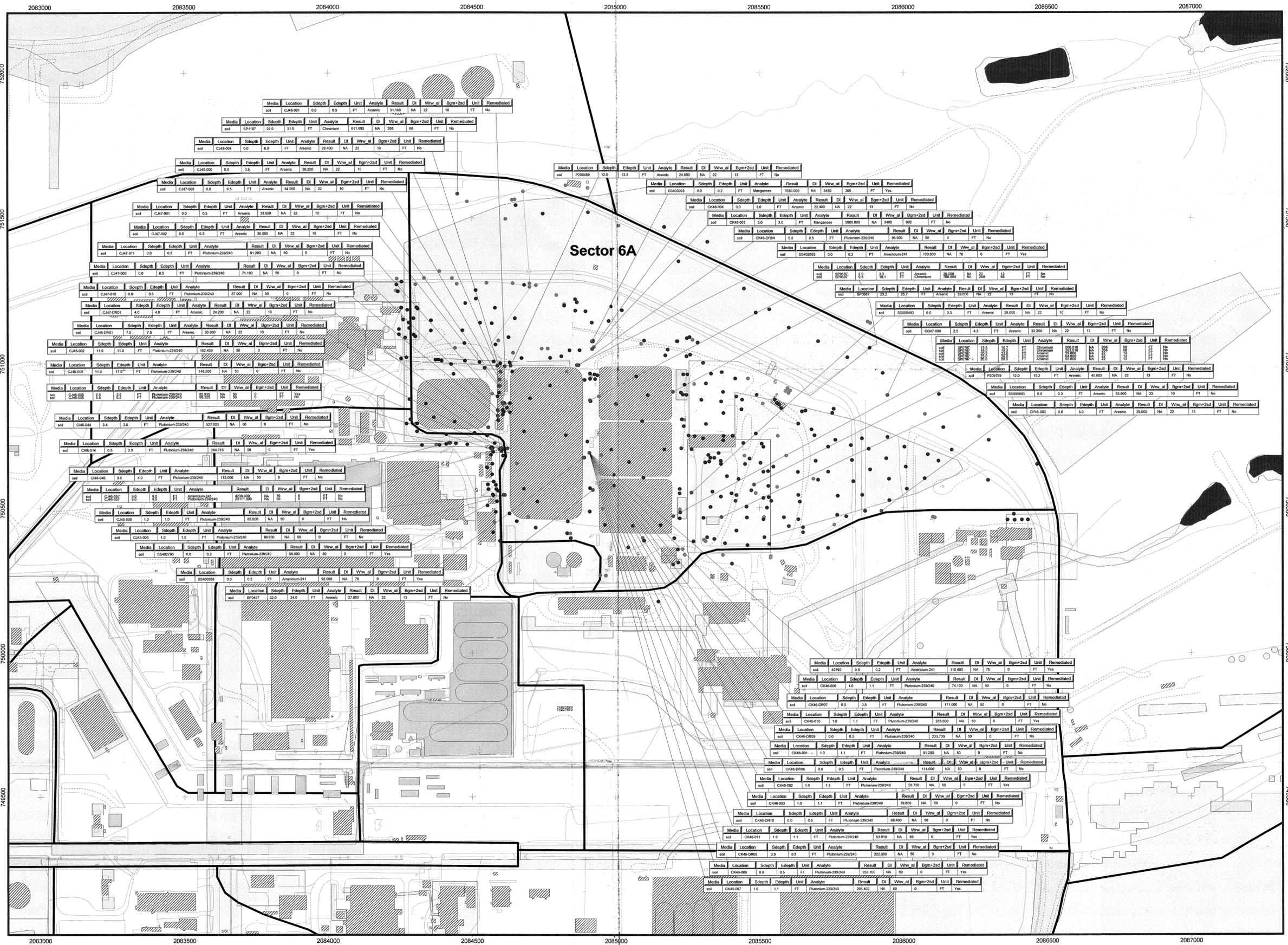
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: **RADMS**

Prepared for: **KAISER HILL COMPANY**

Sector 6A



Media	Location	Depth	Edgth	Unit	Analyte	Result	DI	Wvw	al	Bgm+2sd	Unit	Remediated
soil	C148-001	0.0	0.5	FT	Arsenic	31.100	NA	22	10	FT	No	
soil	SP1187	20.0	31.5	FT	Chromium	611.980	NA	20	08	FT	No	
soil	C148-004	0.0	0.5	FT	Arsenic	28.400	NA	22	13	FT	No	
soil	C148-000	0.0	0.5	FT	Arsenic	38.300	NA	22	10	FT	No	
soil	C147-000	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
soil	C147-001	0.0	0.5	FT	Arsenic	35.500	NA	22	10	FT	No	
soil	C147-002	0.0	0.5	FT	Arsenic	30.500	NA	22	10	FT	No	
soil	C147-003	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
soil	C147-004	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
soil	C147-005	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
soil	C147-006	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
soil	C147-007	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
soil	C147-008	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
soil	C147-009	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
soil	C147-010	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
soil	C147-011	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
soil	C147-012	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
soil	C147-013	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
soil	C147-014	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
soil	C147-015	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
soil	C147-016	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
soil	C147-017	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
soil	C147-018	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
soil	C147-019	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
soil	C147-020	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
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soil	C147-023	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
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soil	C147-027	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
soil	C147-028	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
soil	C147-029	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
soil	C147-030	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
soil	C147-031	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
soil	C147-032	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
soil	C147-033	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
soil	C147-034	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
soil	C147-035	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
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soil	C147-052	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
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soil	C147-057	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
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soil	C147-061	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
soil	C147-062	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
soil	C147-063	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
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soil	C147-093	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
soil	C147-094	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
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soil	C147-098	0.0	0.5	FT	Arsenic	34.500	NA	22	10	FT	No	
soil	C147-099	0.0	0.5	FT	Arsenic	34.500	NA	22				