VARIANCE HISTORY FOR LMICP, Rev 3

Variance Number	LMICP Attachement	General Description	Date Signed	Final Document Distributed	Significant
LMS/FER/S03496-3.0-01	Attachment C, Appendix B, Section 2.1	Add Cu to Cell 7 and Cell 8, LCSs and LDSs	5/26/2009	5/27/2009	No
LMS/FER/S03496-3.0-02	Attachment C, Appendix B, Section 2.1	Add/edit Tables 2-1, 2-3, & 2-4 to incorporate quarterly monitoring	8/4/2009	8/4/2009	**Yes**
LMS/FER/S03496-3.0-03	Attachment D, Chapter 3, Section 3.6.1.6	Add Location 81 and delete Location 2098 to Figure 3-8 and the list on page 3-38	9/1/2009	9/3/2009	No
LMS/FER/S03496-3.0-04	Attachment D, Chapter 4, Section 4.3.2	Move Sediment Locations G4 to G10	9/29/2009	9/29/2009	**Yes**

VARIANCE / FIELD CHANGE NOTICE	Significant? (Yes or No): **No**	**V/F No.** LMS-FER-S03496-3.0-01
DOCUMENT NO: LMS-FER-S03496-3.0-01		**Page** 1 **of** 1
		Date: 05-19-09

DOCUMENT TITLE:
Comprehensive Legacy Management and Institutional Controls Plan, Rev. 3
Volume II, Attachment C – Groundwater/Leak Detection and Leachate Monitoring Plan;
Appendix B – Project-Specific Plan for the On-Site Disposal Facility Monitoring Program

VARIANCE / FIELD CHANGE NOTICE (Include justification)

Requirement: Per Sub-section 2.1 on Page B-3,

> If an analyte is detected in the annual sample from a cell's LCS, that is not being sampled for in the cell's LDS, then confirmatory sampling will be conducted for that constituent in the cell's LCS during the next sampling round. Two consecutive detects in a cell's LCS will trigger sampling in the cell's LDS during the next scheduled sampling event. Two consecutive detects in the cell's LDS will trigger sampling in the cell's HTW and GMA wells.

Variance: For the 2009 sampling round copper will be added to the sampling list for the Cells 7 and 8 LCS and LDS. Therefore, the following changes should be made to the PSP:

- On page B-4, Table 2-1 will include a new Inorganic Parameter stated as follows, "Copper (Cells 7 and 8 only)[d]."
- On page B-5, Table 2-1 a new footnote will be added as follows, "[d]Copper has been added to the Cells 7 and 8 LCS per the requirements discussed under Section 2.1, page B-3 above. The addition is due to the 2008 sample results."
- On page B-6, Table 2-2 will include a new Inorganic Parameter stated as follows, "Copper (Cells 7 and 8 LDS only)[d]."
- On page B-6, Table 2-2 a new footnote will be added as follows, "[d]Copper has been added to the Cells 7 and 8 LDS per the requirements discussed under Section 2.1, page B-3 above. The addition is due to the 2008 sample results."

Justification: Copper has been detected two consecutive times in the Cell 7 and Cell 8 LCS. Copper was identified as a potentially useful monitoring parameter from the LDS to the HTW at Cell 7 and Cell 8 in the Common Ion Report. Therefore as specified in the 2008 SER, copper will continue to be sampled in the Cell 7 and Cell 8 LCS and will be added to the LDS monitoring list at Cell 7 and Cell 8.

Requested By: Charles White Date: 05-19-09

X IF REQD	V/FCN APPROVAL	DATE	X IF REQD	V/FCN APPROVAL	DATE
X	QUALITY & PERFORMANCE ASSURANCE M Hoge	5-26-09	X	HYDROLOGY K Broberg	5/20/09
	DATA QUALITY MANAGEMENT		X	GEOSCIENCES G Lupton	5/20/09
	ANALYTICAL CUSTOMER SUPPORT		X	ENVIRONMENTAL MONITORING K Voisard	5/20/09
	OTHER		X	AQUIFER RESTORATION B Hertel	5/20/09

REVISION REQUIRED (Document NO. & Title):
[X] YES [ ] NO

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VARIANCE / FIELD CHANGE NOTICE	Significant? (Yes or No): **Yes**	**V/F No.** LMS-FER-S03496-3.0-02
DOCUMENT NO: LMS-FER-S03496-3.0-02		**Page** 1 **of** 7
		Date: 08-03-2009

DOCUMENT TITLE:
Comprehensive Legacy Management and Institutional Controls Plan, Rev. 3
Volume II, Attachment C – Groundwater/Leak Detection and Leachate Monitoring Plan;
Appendix B – Project-Specific Plan for the On-Site Disposal Facility Monitoring Program

VARIANCE / FIELD CHANGE NOTICE (Include justification)

Current Requirement: Per Sub-section 2.1 sampling will consist of one sample per year at each horizon as delineated in Tables 2-1 and 2-2 on Pages B-4 through B-6. In addition, Table 2-3 on Page B-7 provides a summary of the sampling requirements for the OSDF.

Variance: For the remainder of 2009 (third and fourth quarters) sampling will be conducted as outlined below. The new tables are attached.

- Table 2-1 includes the annual sampling for the LCS from Cells 1, 2, and 3.
- Table 2-2 includes the quarterly sampling for the LCS, LDS, HTW, and GMA wells from Cells 1 through 8.
- Table 2-3 includes the annual sampling for the LCS from Cells 4, 5, 6, 7, and 8.
- Table 2-4 provides a general summary of the sampling requirements for the OSDF.

Justification: The new sampling requirements were arrived at via a concurred course of action between DOE and OEPA.

Requested By: Charles White Date: 08-03-09

X IF REQD	V/FCN APPROVAL	DATE	X IF REQD	V/FCN APPROVAL	DATE
X	QUALITY / PERFORMANCE ASSURANCE M Hoge	8-4-09	X	HYDROLOGY K Broberg	8-3-09
	DATA QUALITY MANAGEMENT		X	GEOSCIENCES G Lupton	8/4/09
	ANALYTICAL CUSTOMER SUPPORT		X	ENVIRONMENTAL MONITORING D Foster for K Voisard	8-3-09
	OTHER		X	AQUIFER RESTORATION F Johnston for B Hertel	8/4/09

REVISION REQUIRED (Document NO. & Title):
[X] YES [ ] NO

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TABLE 2-1
2009 Annual LCS Monitoring List Requirements for Cells 1, 2, and 3

Parameter	Method	Priority[a]	ASL	Holding Time	Preservation	Standard Volume	Minimum Volume	Container
Radionuclides:								
Technetium-99	Liquid Scint.[b]	2	D	6 months	HNO_3 to pH<2	1 L	500 mL	Plastic or Glass
Inorganics:	SW-846[c]	1	D		HNO_3 to pH<2	1 L	600 mL	Plastic or Glass
Antimony				6 months				
Arsenic								
Barium								
Beryllium								
Boron								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead								
Lithium								
Magnesium								
Manganese								
Nickel								
Potassium								
Selenium								
Silver								
Sodium								
Thallium								
Uranium								
Vanadium								
Zinc								
Mercury				28 days				
Volatile Organics:	SW-846[c]	3	D	14 days	Cool to 4 °C With H_2SO_4, HCL, or solid $NaHSO_4$ to pH<2	4 × 40 mL	1 × 40 mL	Glass Vial with Teflon-lined Septum Cap[d]
Bromodichloromethane								
1,1-Dichloroethene								
1,2-Dichloroethene (Total)								
Tetrachloroethene								
Trichloroethene								
Vinyl Chloride								
Semi-Volatile Organics:	SW-846[c]	6	D	7 days to extraction/ 40 days from extraction to analysis	Cool to 4 °C	1 L	1L	Amber Glass Bottle with Teflon-lined Cap
Carbazole								
4-Nitroaniline								
Bis(2-Chloroisopropyl)ether								
Pesticides:	SW-846[c]	7	D	7 days to extraction/ 40 days from extraction to analysis	Cool to 4 °C	1 L	1 L	Amber Glass Bottle with Teflon-lined Cap
alpha-Chlordane								
General Chemistry:								
Ammonia	350.1[f], 350.3[f], 4500C[g], 4500F[g]	12	D	28 days	Cool to 4 °C, H_2SO_4 to pH<2	500 mL	200 mL	Plastic
Total Organic Halogens (TOX)	9020B[c]	4	D	28 days	Cool to 4 °C, H_2SO_4 to pH<2	500 mL	20 mL	Amber Glass Bottle with Teflon-lined cap[e]
Total Organic Carbon (TOC)	9060[c]	5	D	28 days	Cool to 4 °C, H_2SO_4 to pH<2	250 mL	125 mL	Amber Glass Bottle with Teflon-lined cap
Chloride	325.2[f], 300(all)[f]	10	D	28 days	Cool to 4 °C	250 mL	100 mL	Plastic
Nitrate/Nitrite	353.1[f], 353.2[f], 4500D[g], 4500E[g]	8	D	28 days	Cool to 4 °C, H_2SO_4 to pH<2	100 mL	20 mL	Plastic or Glass
Sulfate	375.2[f], 300.0[f], 4500E[g]	11	D	28 days	Cool to 4 °C	250 mL	100 mL	Plastic
Total Dissolved Solids (TDS)	160.1[f], 2540C[g]	9	D	7 days	Cool to 4 °C	500 mL	250 mL	Plastic or Glass
Total Alkalinity	310.1[f], 2320B[g]	13	D	14 days	Cool to 4 °C	500 mL	250 mL	Plastic

Note: Field parameters are performed at each sampling location prior to sample collection and include dissolved oxygen, ORP, pH, specific conductance, temperature, and Turbidity at ASL A, Priority 1.

[a]If sufficient volume is not available for collection of a full suite at standard volume, then the minimum volume and priority will be used to maximize the number of analytical groups collected.

[b]Radiological analyses do not have standard methods; however, the performance-based analytical specifications for these parameters are provided in the FP QAPP. (Liquid Scint. = Liquid Scintillation)

[c]Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (EPA 1998).

[d]No head space.

[e]Minimal head space – as close to zero as possible.

[f]Methods for Chemical Analysis of Water and Wastes (EPA 1983).

[g]Standard Methods for Analysis of Water and Wastewater, 17th edition (APHA 1989).

TABLE 2-2
2009 Quarterly LCS, LDS, HTW, and GMA Monitoring List Requirements for Cells 1 through 8

Parameter	Method	Priority[a]	ASL	Holding Time	Preservation	Standard Volume	Minimum Volume	Container
Inorganics:	SW-846[b]	1	D	6 months	HNO_3 to pH<2	1 L	600 mL	Plastic or Glass
Arsenic								
Boron								
Cobalt								
Iron								
Lithium								
Manganese								
Nickel								
Selenium								
Sodium								
Uranium								
Zinc								
General Chemistry:								
Total Organic Halogens (TOX)	9020B[b]	2	D	28 days	Cool to 4 °C, H_2SO_4 to pH<2	500 mL	20 mL	Amber Glass Bottle with Teflon-lined cap[c]
Total Organic Carbon (TOC)	9060[b]	3	D	28 days	Cool to 4 °C, H_2SO_4 to pH<2	250 mL	125 mL	Amber Glass Bottle with Teflon-lined cap
Sulfate	375.2[d], 300.0[d], 4500E[e]	5	D	28 days	Cool to 4 °C	250 mL	100 mL	Plastic
Total Dissolved Solids (TDS)	160.1[d], 2540C[e]	4	D	7 days	Cool to 4 °C	500 mL	250 mL	Plastic or Glass

Note: Field parameters are performed at each sampling location prior to sample collection and include dissolved oxygen, ORP, pH, specific conductance, temperature, and Turbidity at ASL A, Priority 1.

[a]If sufficient volume is not available for collection of a full suite at standard volume, then the minimum volume and priority will be used to maximize the number of analytical groups collected.

[b]Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (EPA 1998).

[c]Minimal head space – as close to zero as possible.

[d]Methods for Chemical Analysis of Water and Wastes (EPA 1983).

[e]Standard Methods for Analysis of Water and Wastewater, 17th edition (APHA 1989).

TABLE 2-3
2009 Annual LCS Monitoring List Requirements for Cells 4, 5, 6, 7, and 8

Parameter	Method	Priority[a]	ASL	Holding Time	Preservation	Standard Volume	Minimum Volume	Container
Radionuclides:								
Technetium-99	Liquid Scint.[b]	2	D	6 months	HNO_3 to pH<2	1 L	500 mL	Plastic or Glass
Inorganics:	SW-846[c]	1	D		HNO_3 to pH<2	1 L	600 mL	Plastic or Glass
Antimony				6 months				
Arsenic								
Barium								
Beryllium								
Boron								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead								
Lithium								
Magnesium								
Manganese								
Nickel								
Potassium								
Selenium								
Silver								
Sodium								
Thallium								
Uranium								
Vanadium								
Zinc								
Mercury				28 days				
Volatile Organics:	SW-846[c]	3	D	14 days	Cool to 4 °C With H_2SO_4, HCL, or solid $NaHSO_4$ to pH<2	4 × 40 mL	1 × 40 mL	Glass Vial with Teflon-lined Septum Cap[d]
Acetone								
Acrylonitrile								
Benzene								
Bromochloromethane								
Bromodichloromethane								
Bromoform								
Bromomethane								
2-Butanone								
Carbon disulfide								
Carbon tetrachloride								
Chlorobenzene								
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								

TABLE 2-3 (Continued)
2009 Annual LCS Monitoring List Requirements for Cells 4, 5, 6, 7, and 8

Parameter	Method	Priority[a]	ASL	Holding Time	Preservation	Standard Volume	Minimum Volume	Container
Volatile Organics (Cont.): 1,2-Dibromo-3-chloropropane Ethylene dibromide[h] 1,2-Dichlorobenzene 1,4-Dichlorobenzene trans-1,4-Dichloro-2-butene 1,1-Dichloroethane 1,2-Dichloroethane 1,1-Dichloroethene 1,2-Dichloroethene (Total) 1,2-Dichloropropane cis-1,3-Dichloropropene trans-1,3-Dichloropropene Ethylbenzene 2-Hexanone Methylene Bromide Methylene Chloride Methyl iodide 4-Methyl-2-penanone Styrene 1,1,1,2-Tetrachloroethane 1,1,2,2-Tetrachloroethane Tetrachloroethene Toluene 1,1,1-Trichloroethane 1,1,2-Trichloroethane Trichloroethene Trichlorofluoromethane 1,2,3-Trichloropropane Vinyl Acetate Vinyl Chloride Xylenes (Total)	SW-846[c]	3	D	14 days	Cool to 4 °C With H_2SO_4, HCL, or solid $NaHSO_4$ to pH<2	4 × 40 mL	1 × 40 mL	Glass Vial with Teflon-lined Septum Cap[d]
Semi-Volatile Organics: Carbazole 4-Nitroaniline Bis(2-Chloroisopropyl)ether	SW-846[c]	6	D	7 days to extraction/ 40 days from extraction to analysis	Cool to 4 °C	1 L	1L	Amber Glass Bottle with Teflon-lined Cap
Pesticides: alpha-Chlordane	SW-846[c]	7	D	7 days to extraction/ 40 days from extraction to analysis	Cool to 4 °C	1 L	1 L	Amber Glass Bottle with Teflon-lined Cap
PCBs: Aroclor 1016, 1221, 1232, 1242, 1248, 1254, and 1260	SW-846[c]	8	D	7 days to extraction/ 40 days from extraction to analysis	Cool to 4 °C	1 L	1 L	Amber Glass Bottle with Teflon-lined Cap

TABLE 2-3 (Continued)
2009 Annual LCS Monitoring List Requirements for Cells 4, 5, 6, 7, and 8

Parameter	Method	Priority[a]	ASL	Holding Time	Preservation	Standard Volume	Minimum Volume	Container
General Chemistry:								
Ammonia	350.1[f], 350.3[f], 4500C[g], 4500F[g]	13	D	28 days	Cool to 4 °C, H_2SO_4 to pH<2	500 mL	200 mL	Plastic
Total Organic Halogens (TOX)	9020B[c]	4	D	28 days	Cool to 4 °C, H_2SO_4 to pH<2	500 mL	20 mL	Amber Glass Bottle with Teflon-lined cap[e]
Total Organic Carbon (TOC)	9060[c]	5	D	28 days	Cool to 4 °C, H_2SO_4 to pH<2	250 mL	125 mL	Amber Glass Bottle with Teflon-lined cap
Chloride	325.2[f], 300(all)[f]	11	D	28 days	Cool to 4 °C	250 mL	100 mL	Plastic
Nitrate/Nitrite	353.1[f], 353.2[f], 4500D[g], 4500E[g]	9	D	28 days	Cool to 4 °C, H_2SO_4 to pH<2	100 mL	20 mL	Plastic or Glass
Sulfate	375.2[f], 300.0[f], 4500E[g]	12	D	28 days	Cool to 4 °C	250 mL	100 mL	Plastic
Total Dissolved Solids (TDS)	160.1[f], 2540C[g]	10	D	7 days	Cool to 4 °C	500 mL	250 mL	Plastic or Glass
Total Alkalinity	310.1[f], 2320B[g]	14	D	14 days	Cool to 4 °C	500 mL	250 mL	Plastic

Note: Field parameters are performed at each sampling location prior to sample collection and include dissolved oxygen, ORP, pH, specific conductance, temperature, and Turbidity at ASL A, Priority 1.

[a]If sufficient volume is not available for collection of a full suite at standard volume, then the minimum volume and priority will be used to maximize the number of analytical groups collected.

[b]Radiological analyses do not have standard methods; however, the performance-based analytical specifications for these parameters are provided in the FP QAPP. (Liquid Scint. = Liquid Scintillation)

[c]Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (EPA 1998).

[d]No head space.

[e]Minimal head space – as close to zero as possible.

[f]Methods for Chemical Analysis of Water and Wastes (EPA 1983).

[g]Standard Methods for Analysis of Water and Wastewater, 17th edition (APHA 1989).

[h]Also referred to as 1,2-dibromoethane.

TABLE 2-4
Summary of Sampling Requirements for the OSDF

Cell(s)	Monitoring Horizons	Annually	Quarterly
1 through 3	LCS	Table 2-1	Table 2-2
	LDS, HTW, GMA	NA	Table 2-2
4 through 8	LCS	Table 2-3	Table 2-2
	LDS, HTW, GMA	NA	Table 2-2

LCS = leachate collection system
LDS = leak detection system
HTW = horizontal till well
GMA = Great Miami Aquifer

VARIANCE / FIELD CHANGE NOTICE	Significant? (Yes or No): **No**	**V/F No.** LMS-FER-S03496-3.0-03
DOCUMENT NO: LMS-FER-S03496-3.0-03		**Page 1 of 3**
		Date: 08-24-2009

DOCUMENT TITLE:
Comprehensive Legacy Management and Institutional Controls Plan, Rev. 3
Volume II, Attachment D – Integrated Environmental Monitoring Plan;
Section 3.0 – Groundwater Monitoring Program

VARIANCE / FIELD CHANGE NOTICE (Include justification)

Current Requirement: Under Section 3.6.1.6 groundwater elevations are taken from Well 2098, which is a private well located northeast of the Fernald Preserve. Measured water levels from this well are used to help interpret groundwater flow directions.

Variance: Well 2098 is being replaced by Well 81. Well 2098 will be removed from and Well 81 will be added to Figure 3-8 and the table on Page 3-38 (see attachment).

Justification: A new land owner has denied access to Well 2098.

INFORMATION ONLY

Requested By: Charles White Date: 08-24-09

X IF REQD	V/FCN APPROVAL	DATE	X IF REQD	V/FCN APPROVAL	DATE
X	QUALITY & PERFORMANCE ASSURANCE M Hoge	9-1-09	X	HYDROLOGY K Broberg	8-24-09
	DATA QUALITY MANAGEMENT		X	GEOSCIENCES G Lupton	8/24/09
	ANALYTICAL CUSTOMER SUPPORT		X	ENVIRONMENTAL MONITORING K Voisard	8-24-09
	OTHER		X	AQUIFER RESTORATION B Hertel	8/25/09

REVISION REQUIRED (Document NO. & Title):
[X] YES [ ] NO

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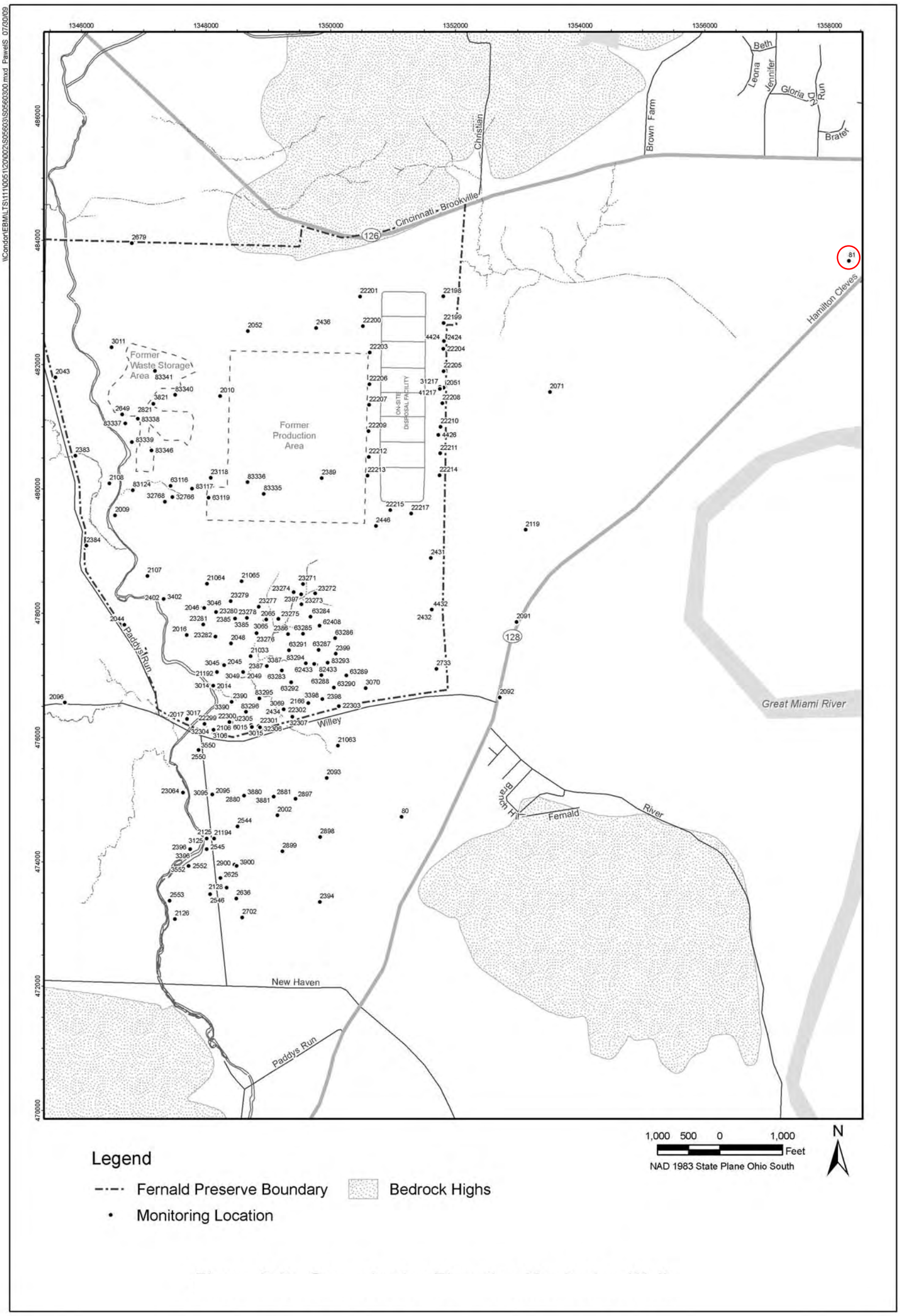

Figure 3–8. Groundwater Elevation Monitoring Wells

List of Groundwater Elevation Monitoring Wells

80	2389	3017	22203	32306
81	2390	3045	22204	32307
2002	2394	3046	22205	32766
2009	2396	3049	22206	32768
2010	2397	3065	22207	41217
2014	2398	3069	22208	62408
2016	2399	3070	22209	62433
2017	2402	3095	22210	63116
2043	2424	3106	22211	63119
2044	2431	3125	22212	63283
2045	2432	3385	22213	63284
2046	2434	3387	22214	63285
2048	2436	3390	22215	63286
2049	2446	3396	22217	63287
2051	2544	3398	22299	63288
2052	2545	3402	22300	63289
2065	2546	3550	22301	63290
2071	2550	3552	22302	63291
2091	2552	3821	22303	63292
2092	2553	3880	23064	82433
2093	2625	3881	23118	83117
2095	2636	3900	23271	83124
2096	2649	4424	23272	83293
2106	2679	4426	23273	83294
2107	2702	4432	23274	83295
2108	2733	6015	23275	83296
2119	2821	21033	23276	83335
2125	2880	21063	23277	83336
2126	2881	21064	23278	83337
2128	2897	21065	23279	83338
2166	2898	21192	23280	83339
2383	2899	21194	23281	83340
2384	2900	22198	23282	83341
2385	3011	22199	31217	83346
2386	3014	22200	32304	
2387	3015	22201	32305	

VARIANCE / FIELD CHANGE NOTICE	Significant? (Yes or No): **Yes**	**V/F No.** LMS-FER-S03496-3.0-04
DOCUMENT NO: LMS-FER-S03496-3.0-04		**Page 1 of 2**
		Date: 09-29-2009

DOCUMENT TITLE:
Comprehensive Legacy Management and Institutional Controls Plan, Rev. 3
Volume II, Attachment D – Integrated Environmental Monitoring Plan;
Section 4.0 – Surface Water, Treated Effluent, and Sediment Monitoring Program

VARIANCE / FIELD CHANGE NOTICE (Include justification)

Current Requirement: Section 4.3.2.1 Constituents of Concern states that sediment samples will be collected from two locations on the Great Miami River: one downstream from the outfall line and one background location. Tables 4-3 and 4-5, and Figure 4-4 identify the two sediment sampling locations as G2 (Great Miami River- sediment background) and G4 (Great Miami River- downstream sediment).

Variance: Location G4, which is on the western bank of the Great Miami River and downstream of the outfall line, will be replaced by location G10. Location G10 is on the eastern side of the Great Miami River on a gravel bar downstream and across the river from the outfall line. Figure 4-4 has been revised to show location G10 and is included as page 2 of this variance. In addition, Location G4 from Tables 4-3 and 4-5 will be changed to G10, as will any other reference to Location G4 (e.g., see Section 4.4.1.2).

Justification: Location G4 cannot be accessed safely from the western bank of the Great Miami River. Therefore, the sampling location has been moved across the river and downstream of the outfall line.

Requested By: Charles White Date: 09-29-09

X IF REQD	V/FCN APPROVAL	DATE	X IF REQD	V/FCN APPROVAL	DATE
X	QUALITY & PERFORMANCE ASSURANCE M Hoge	9/29/09		HYDROLOGY	
	DATA QUALITY MANAGEMENT		X	GEOSCIENCES G Lupton	9/29/09
	ANALYTICAL CUSTOMER SUPPORT		X	ENVIRONMENTAL MONITORING K Voisard	9/29/09
X	OTHER F. Johnston	9/29/09		AQUIFER RESTORATION	

REVISION REQUIRED (Document NO. & Title):
[X] YES [ ] NO

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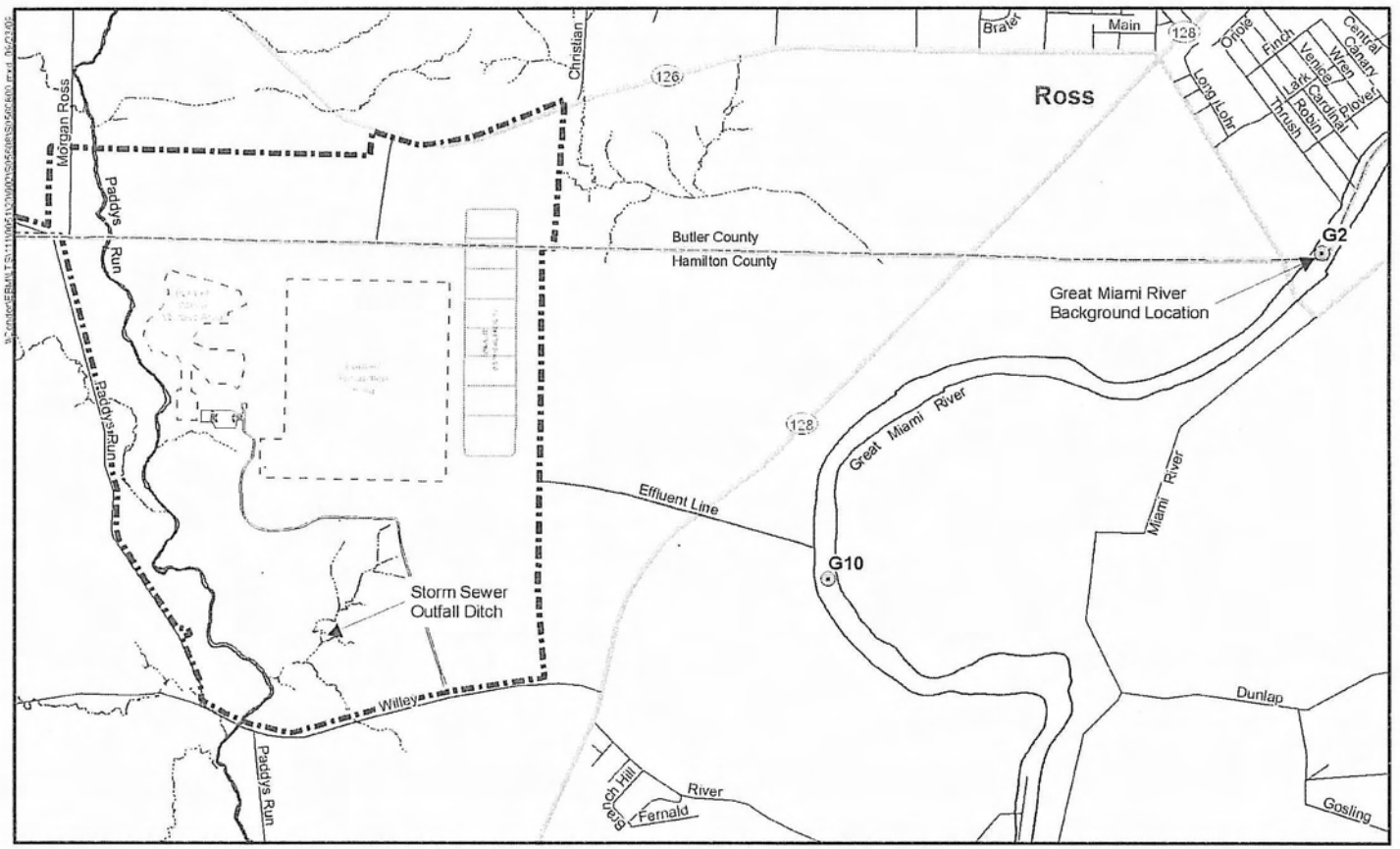

Legend

Fernald Preserve Boundary

IEMP Sediment Sample Location

1,000 500 0 1,000 2,000 Feet

N

Figure 4-4. Sediment Sample Locations