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Department of Energy

Ohio Field Office
Fernald Environmental Management Project
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SEP 19 2003

DOE-0517-03

Mr. James A. Saric, Remedial Project Manager
United States Environmental Protection Agency
Region V, SR-6J
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Mr. Tom Schneider, Project Manager
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, Ohio 45402-2911

Dear Mr. Saric and Mr. Schneider:

TRANSMITTAL OF RESPONSES TO THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY AND OHIO ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE 2002 SITE ENVIRONMENTAL REPORT

This letter transmits the subject comment responses to the United States Environmental Protection Agency (USEPA) and Ohio Environmental Protection Agency (OEPA).

If you have any questions or comments pertaining to these comment responses, please contact Ed Skintik of my staff at (513) 648-3151.

Sincerely,

Glenn Griffiths
Acting Director

FCP:Skintik

Enclosure: As Stated

Recycled and Recyclable

cc w/enclosure:
N. Hallein, EM-31/CLOV
G. Jablonowski, USEPA-V, SR-6J
M. Murphy, USEPA-V, AE-17J
T. Schneider, OEPA-Dayton (total of 3 copies of encl.)
F. Bell, ATSDR
M. Shupe, HIS GeoTrans
R. Vandegrift, ODH
M. Wojciechowski, Tetra Tech
AR Coordinator, Fluor Fernald, Inc./ MS78

cc w/o enclosure:
K. Johnson, OH/FCP
D. Carr, Fluor Fernald, Inc./MS1
J. D. Chiou, Fluor Fernald, Inc./MS64
M. Frank, Fluor Fernald, Inc./MS90
M. Jewett, Fluor Fernald, Inc./MS52-5
C. Tabor, Fluor Fernald, Inc./MS90
ECDC, Fluor Fernald, Inc./MS52-7

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RESPONSES TO USEPA AND OEPA TECHNICAL REVIEW COMMENTS ON THE 2002 SITE ENVIRONMENTAL REPORT

FERNALD CLOSURE PROJECT
FERNALD, OHIO

AUGUST 2003

U.S. DEPARTMENT OF ENERGY

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RESPONSES TO U.S. EPA TECHNICAL REVIEW COMMENTS ON THE 2002 SITE ENVIRONMENTAL REPORT

SPECIFIC COMMENTS

1. Commenting Organization: U.S. EPA Commenter: Saric
Section #: 2.1 Pg #: 20 Line #: Not Applicable (NA) Code:
Original Specific Comment #: 1
Comment: The address of the Public Environmental Information Center is not listed in the document and should be included.
Response: The address of the Public Environmental Information Center is on the inside front cover of the 2002 Site Environmental Report.
Action: DOE will continue to provide the address of the Public Information Center in future site environmental reports.

2. Commenting Organization: U.S. EPA Commenter: Saric
Section #: 2.1.2 Pg #: 26 Line #: NA Code:
Original Specific Comment #: 2
Comment: The volume of contaminated soil removed from each area is not listed and should be included.
Response: The volume of contaminated soil removed from each of the nine soil remediation areas for the report's calendar year will be included in future site environmental reports.
Action: As stated in response.

3. Commenting Organization: U.S. EPA Commenter: Saric
Section #: 2.2.4 Pg #: 35 Line #: NA Code:
Original Specific Comment #: 3
Comment: The text states, "Other informational notifications were made as deemed appropriate." A list or general examples of these notifications should be included.
Response: Other informational notifications identified in the 2002 Site Environmental Report were courtesy notifications made to organizations other than those that require notification. Depending on the type of release, they may include EPA, Region V; OEPA Southwest District Office, Division of Hazardous Waste Management; Ohio EMA; Ohio Emergency Response Commission; Butler County LEPC; Hamilton County LEPC; and Crosby Township Fire Department.
Action: In future site environmental reports, general examples of these courtesy notifications will be provided.

4. Commenting Organization: U.S. EPA Commenter: Saric
Section #: 3.2 Pg #: 44 and 45 Line #: NA Code:
Original Specific Comment #: 4
Comment: Figures 3-1 and 3-2 do not show groundwater flow direction. Groundwater flow direction is in Figure 3-8; however, the extraction and reinjection wells are not shown. A figure should be included that shows the current 30-microgram-per-liter (μg/L) total uranium plume, extraction and re-injection wells, and the groundwater flow direction. In addition, no figures depicting the current vertical extent of the plume are included in the report. If groundwater modeling has been completed as stated in the text, these figures should be included.
Response: The uranium plume outline shown in Figures 3-1 and 3-2 is based on monitoring results. In future reports, the groundwater flow direction arrows shown in Figure 3-8 will be included on Figures 3-1 and 3-2. At least one cross section showing the vertical extent of the uranium plume will be included in future reports. Monitoring data (including direct-push) will be used to construct the cross section so that it will match the 30 μg/L uranium plume outline shown in Figures 3-1 and 3-2.

Action: As stated in response.

5. Commenting Organization: U.S. EPA Commenter: Saric
Section #: 3.3.1.1 Pg #: 51 Line #: NA Code:
Original Specific Comment #: 5
Comment: Table 3-1 summarizes target pumping rates, total gallons pumped, and the amount of uranium removed for each groundwater restoration module. The South Plume Optimization module, which includes extraction wells 32308 and 32309, lists target pumping rates but does not include gallons pumped or uranium removed. It is unclear whether the values listed for the South Plume module include extractions wells 32308 and 32309. This issue should be clarified.
Response: The gallons pumped and uranium removed values that are presented in Table 3-1 for the South Plume/South Plume Optimization Module include extraction wells 32308 and 32309. Only the target pumping rates for 32308 and 32309 were reported separately. In future reports, target-pumping rates for the two South Plume Optimization wells will not be documented separately.
Action: As stated in response.

6. Commenting Organization: U.S. EPA Commenter: Saric
Section #: 3.3.14 Pg #: 55 Line #: NA Code:
Original Specific Comment #: 6
Comment: The text states that "all re-injection wells were shut down and remained off-line for the rest of the year to help insure compliance with the site's monthly average uranium discharge limit" but does not indicate why the monthly average uranium discharge limit would be exceeded. The text should be revised to include an explanation or statement indicating that this information is discussed in Section 4.3.2.
Response: In future reports, care will be taken to clarify such statements.
Action: As stated in response.

7. Commenting Organization: U.S. EPA Commenter: Saric
Section #: 4.3.1 Pg #: 71 Line #: NA Code:
Original Specific Comment #: 7
Comment: The text states that "FRL and BTV exceedances will continue to be evaluated for persistence and increasing trends through the Integrated Environmental Management Project (IEMP) sampling program throughout remediation." The chromium concentration at SWP-03 has already shown an increasing trend, but the text does not discuss a remedy for this trend. At a minimum, the text should state the type of control measures that would be implemented if the trend continues.
Response: SWP-03 is a sampling location that measures the cumulative impact from several drainage basins to Paddys Run, as well as drainage upstream of FCP property. An attempt was made to identify a specific cause of the exceedance when the result was discovered, but the numerous activities occurring in each basin precluded the ability to identify a specific cause. Any control measure specified would have to be applied at the source and would depend on successfully identifying the cause/source.
Action: No action required.

8. Commenting Organization: U.S. EPA Commenter: Saric
Section #: Appendix A Pg #: A.1-21 Line #: NA Code:
Original Specific Comment #: 8
Comment: The table indicates that extraction well 3927 has only 0.03 uranium removal index. This value is very low compared to the removal indices of all of the other extraction wells. The text should provide justification for continuing to operate this well.
Response: Well 3927 is located downgradient of the leading edge of the 30 µg/L uranium plume. It is part of a Barrier System that is pumping to prevent the FCP uranium plume from migrating

south of the barrier and mixing with a separate contamination plume that emanates from facilities south of the FCP.

Action: No action required.

9. Commenting Organization: U.S. EPA Commenter: Saric
Section #: Appendix C Pg #: B.2-1 Line #: NA Code:
Original Specific Comment #: 9

Comment: The text states, "In comparison to 2001 data, the average thorium, uranium, and radium results from the Storm Sewer Outfall Ditch (D1-D5) were slightly higher in 2002." Although these results were within the historical range of values for this location, these concentrations are the highest observed since 1996. The text should include a discussion of the probable cause for this increase and propose additional controls if warranted.

Response: No definitive cause has been identified for the slight increases in thorium and uranium; note that all constituents are below the final remediation levels. One possible source is storm water runoff from the eastern, southeastern, and southern portions of the site (south of the OSDF extending to the borrow area) that consist of both certified and small, uncertified areas including excavation areas, gravel parking lots, recovery well locations, and vegetated fields. Even though erosion and sediment controls are in place and functioning, sediment entrained in storm water (due to reduced vegetative cover as a result of construction activities in these areas) may have contributed to the slight increase. Another possible source is sediment deposited during the production era in the east parking lot storm sewer that now handles storm water overflows from Basin 2, which empties into the Storm Sewer Outfall Ditch. A third possible source may be re-suspension of existing Storm Sewer Outfall Ditch sediment (deposited during the production years) that was recently re-deposited near the surface. Given the fact that all the data are below their respective FRLs, no additional controls are warranted.

Action: No action required.

10. Commenting Organization: U.S. EPA Commenter: Saric
Section #: 5.3 Pg #: 85, 87 and C.1-8 Line #: NA Code:
Original Specific Comment #: 10

Comment: Table 5-1, Figure 5-3, and Table C.1-5 (in Attachment C.1) present conflicting information on the maximum thorium-230 concentration measured at the fenceline during 2002. Table 5-1 lists a maximum concentration of 5.8 E-04 picoCuries per cubic meter (pCi/m^3) at location AMS-3, but Figure 5-3 shows a maximum concentration of 3.2 E-04 pCi/m^3 at location AMS-9C. The more complete data presented in Table C.1-5 indicate that the maximum concentration was 4.9 E-04 pCi/m^3 at location AMS-6. Future reports should be checked to verify that the thorium-230 data are consistent across multiple formats and for multiple locations.

Response: The text incorrectly identifies AMS-3 as the monitoring location with the maximum biweekly thorium-230 concentration. The WPTH-2 monitor, a project-specific monitor located on the western FCP fenceline, recorded the maximum biweekly thorium-230 concentration of 5.8E-4 pCi/m3 that is reported in Tables 5-1 and C.1-5. The data in the Figure 5-3 and Table 5-1 are not necessarily from the same set of air monitors, so complete agreement between the table and figure is not expected. Figure 5-3 covers the biweekly thorium data for AMS-3, 8A, and 9C, monitors that typically record the highest annual average thorium-230 concentrations; whereas Table 5-1 reports the minimum, maximum, and average data from all fenceline monitors.

Action: In future reports, care will be taken to verify that the data are consistent across multiple formats and for multiple locations.

11. Commenting Organization: U.S. EPA Commenter: Saric
Section #: 5.4.1 Pg #: 92 Line #: NA Code:
Original Specific Comment #: 11

Comment: The number of events when the 100-picoCurie per liter (pCi/L) limit for radon was exceeded is underreported. Section 5.4.1 reports 10 exceedance events for 2002, and Table C.2-1 lists these individual events; however, based on fourth quarter hourly radon data from the IEMP Data Information Site, two exceedance events in October 2002 are not reported. Radon concentrates of 133 and 107 pCi/L, respectively, were recorded at monitoring location KSO on October 7 and at monitoring location KNE on October 21. Neither event is listed in Table C.2-1 or discussed in Section 5.4.1. The radon data for the first three quarters of 2002 should be reviewed for exceedance events that may have been omitted, and Section 5.4.1 and Table C.2-1 should be revised accordingly.

Response: Section 5.4.1 and Table C.2-1 of the report are correct regarding radon exceedances. The October 2002 hourly radon data file, initially posted to the IEMP Data Information Site, contained spurious data from instrument source checks, instrument malfunctions, and artifacts from the electronic data collection process. The radon data files have been revised to eliminate the spurious data and re-posted to the IEMP Data Information Site.

Action: In the future, care will be taken to verify data posted on the IEMP Data Information Site.

12. Commenting Organization: U.S. EPA Commenter: Saric
Section #: 5.5 Pg #: 96 and 97 Line #: NA Code:
Original Specific Comment #: 12

Comment: The text states that "the increasing trend in direct radiation levels at TLD location 6 stabilized in 2002" and refers to figure 5-9; however, Figure 5-9 shows the direct radiation dose increasing over the first three quarters of 2002 and then decreasing during the fourth quarter. The fourth quarter decrease is evidently interpreted as evidence that the increasing trend has stabilized; however, Figure 5-9 shows similar decreases in the direct radiation dose from one quarter to the next in 1998, 1999, and 2000. After each of these quarterly decreases, the upward trend continued. For future reports, all previous data and not just data from the current year should be considered before statements are made concerning trends.

Response: Experience with environmental TLDs at the FCP has indicated that seasonal variations influence the direct radiation levels measured by the TLDs and, as noted by the commenter, trends in direct radiation levels cannot necessarily be determined from a one or even several quarterly measurements. Experience has also shown that direct radiation levels at the FCP are correlated to silo headspace radon concentrations. The basis for stating that the increasing trend in direct radiation levels at (TLD location 6) stabilized in 2002 does not rest solely on the decrease in fourth quarter measurements. The stabilization in direct radiation measurements in the vicinity of the K-65 Silos (as indicated in Figure 5-8) and the stabilization in headspace radon concentrations (mentioned in Section 5.4.1) also provide support for the statement.

Action: No action required.

13. Commenting Organization: U.S. EPA Commenter: Saric
Section #: 5.6 Pg #: 98 Line #: NA Code:
Original Specific Comment #: 13

Comment: The comparison in the last sentence of this paragraph is potentially misleading because the average radon release rate for the Waste Pits Remedial Action Project dryer stack is compared to an estimated maximum release rate. The text should be revised to compare the actual and estimated average radon release rates.

Response: DOE recognizes that the referenced text is potentially misleading and subject to misinterpretation. The intent of the comparison and text was to show that the measured radon-222 release rates (maximum and average radon-222 release rates for 2002) were substantially less than the estimated (i.e., modeled) maximum release rate of 13,000 uCi/hr. The estimated maximum release rate was calculated based on the highest total radium-226 content of the six waste pits and the design feed rate for the dryers. In the future, the Waste

Pits Remedial Action Project (now identified as the Waste Pit Project) will report the total hours radon-222 was released, the average radon-222 release rate, and the number of times the estimated maximum release rate of 13,000 uCi/hr was exceeded during the reporting period.

Action: As stated in response.

14. Commenting Organization: U.S. EPA Commenter: Saric
Section #: 5.6 Pg #: 101 Line #: NA Code:
Original Specific Comment #: 14

Comment: The text incorrectly states that particulate radionuclide and radon emissions from the Silos Project radon control system are subject to emission standards in Title 40 of the *Code of Federal Regulations*, Part 61, Subpart H. This regulation applies to particulate radionuclide emissions, not to radon emissions. The text should be revised to refer to the correct regulation.

Response: DOE recognizes that radon monitoring is not subject to the emission standards of 40 CFR 61, Subpart H. DOE also recognizes that the text in question is poorly phrased and may lead to misunderstanding. The text states the Silos project continuous stack monitoring system was installed in accordance with Title 40 of the *Code of Federal Regulations*, Part 61, Subpart H. A parenthetical comment was added for informational purposes to describe constituents to be monitored by the RCS stack monitor - both particulate radionuclides and radon. This parenthetical information was not intended to imply radon was subject to the provisions of Subpart H.

Action: In future reports, care will be taken to clarify such statements.

15. Commenting Organization: U.S. EPA Commenter: Saric
Section #: 7.0 Pg #: 113 Line #: NA Code:
Original Specific Comment #: 15

Comment: A general description of natural resources is provided. The statement that "these resources are considered in the Natural Resources Monitoring Plan" is unclear. The text should be revised to clarify if the term refers to cultural resources only, cultural resources and endangered species habitat, or all habitats.

Response: DOE agrees with the comment.

Action: In future reports, it will be stated that cultural resources are included as part of the Natural Resource Monitoring Plan.

16. Commenting Organization: U.S. EPA Commenter: Saric
Section #: 7.3 Pg #: 116 Line #: NA Code:
Original Specific Comment #: 16

Comment: The text should be revised to either define the term "soil amendment" or to indicate where it is defined in the text.

Response: DOE agrees with the comment. By adding organic matter, the quality of the soil is improved and made more amenable for plant growth. Soil amendments add nutrients and microorganisms, lessen compaction, and improve drainage.

Action: In future reports, DOE will add text to state that soil amendments typically involve the tilling of organic matter (i.e., compost and woodchips) into compacted soil.

17. Commenting Organization: U.S. EPA Commenter: Saric
Section #: 7.3 Pg #: 116 Line #: NA Code:
Original Specific Comment #: 17

Comment: Either invasive species control efforts should be specified or the text should indicate that discusses these efforts.

Response: DOE agrees with the comment.

Action: In future reports, DOE will add text to state that invasive species are controlled through a combination of herbicide application, cutting or mowing, and hand pulling.

18. Commenting Organization: U.S. EPA Commenter: Saric
Section #: 7.3 Pg #: 116 Line #: NA Code:
Original Specific Comment #: 18

Comment: The text should either indicate response actions to be taken if mortality counts or herbaceous cover are not acceptable, or should refer to the document that discusses these issues.

Response: DOE agrees with the comment.

Action: In future reports, DOE will add text to state that monitoring requirements and response actions are detailed in the annual Consolidated Monitoring Report for Restored Areas at the FCP.

RESPONSES TO OEPA TECHNICAL REVIEW COMMENTS ON THE 2002 SITE ENVIRONMENTAL REPORT

19. Commenting Organization: Ohio EPA Commenter: GeoTrans, Inc.
Section #: Attachment A.1 Pg #: A.1-4 Line #: 30 Code: C
Original Comment #: 1

Comment: How do the eH and pH data compare to the levels that define the stability field for hexavalent chromium species?

Response: Chromium (VI) compounds are stable and occur naturally in the environment under very oxidizing conditions (Eh > 500 millivolts at a pH of 7). Readings recorded in 2002 indicate that Eh, pH conditions needed for the presence of chromium (VI) in the aquifer did occur around the re-injection wells (see the following table).

Well/Date	Temp	DO	SC	pH	Orp
22298					
1st qtr 02	–[a]	–[a]	–[a]	–[a]	–[a]
2nd qtr 02	7.13	7.57	539.09	7.61	313.72
3rd qtr 02	12.69	3.07	597.24	7.45	449.44
4th qtr 02	13.79	1.90	592.76	7.28	565.48

Well/Date	Temp	DO	SC	pH	Orp
32304					
1st qtr 02	–[a]	–[a]	–[a]	–[a]	–[a]
2nd qtr 02	10.65	0.08	673.65	7.10	483.20
3rd qtr 02	10.74	0.38	663.44	7.42	397.04
4th qtr 02	10.88	0.30	621.64	7.11	506.64

Well/Date	Temp	DO	SC	pH	Orp
22300					
1st qtr 02	–[a]	–[a]	–[a]	–[a]	–[a]
2nd qtr 02	13.26	6.34	602.87	7.54	515.60
3rd qtr 02	10.84	5.56	973.55	7.34	536.96
4th qtr 02	9.81	3.09	519.15	7.39	463.40

Well/Date	Temp	DO	SC	pH	Orp
32305					
1st qtr 02	–[a]	–[a]	–[a]	–[a]	–[a]
2nd qtr 02	11.25	0.07	801.89	7.34	121.76
3rd qtr 02	11.59	4.03	740.12	7.33	417.20
4th qtr 02	10.60	5.33	594.96	6.92	473.68

Well/Date	Temp	DO	SC	pH	Orp
22301					
1st qtr 02	–[a]	–[a]	–[a]	–[a]	–[a]
2nd qtr 02	12.04	8.68	687.28	7.56	572.40
3rd qtr 02	12.96	8.15	688.00	7.73	550.20
4th qtr 02	12.95	6.71	637.09	7.32	492.00

Well/Date	Temp	DO	SC	pH	Orp
32306					
1st qtr 02	–[a]	–[a]	–[a]	–[a]	–[a]
2nd qtr 02	11.83	0.03	759.73	7.33	-111.16
3rd qtr 02	12.38	0.29	705.35	7.33	-37.20
4th qtr 02	12.33	0.13	710.66	7.19	-40.36

Well/Date	Temp	DO	SC	pH	Orp
22302					
1st qtr 02	–[a]	–[a]	–[a]	–[a]	–[a]
2nd qtr 02	12.06	8.46	677.18	7.47	585.24
3rd qtr 02	12.91	6.89	672.73	7.63	494.12
4th qtr 02	12.33	7.18	620.41	7.45	550.76

Well/Date	Temp	DO	SC	pH	Orp
32307					
1st qtr 02	–[a]	–[a]	–[a]	–[a]	–[a]
2nd qtr 02	12.07	0.13	665.94	7.27	68.44
3rd qtr 02	13.01	0.22	691.32	7.34	95.04
4th qtr 02	12.87	0.19	632.57	7.20	195.20

Well/Date	Temp	DO	SC	pH	Orp
22303					
1st qtr 02	–[a]	–[a]	–[a]	–[a]	–[a]
2nd qtr 02	12.05	8.95	677.53	7.37	523.24
3rd qtr 02	13.01	6.82	669.20	7.57	551.36
4th qtr 02	12.49	10.00	749.00	6.50	562.92

[a] Equipment problems, no readings collected

Conditions favorable for the presence of chromium (VI) around the re-injection wells have been recorded before, but the probability for the actual presence of chromium (VI) has been determined to be low. This determination is based on the results of a study on the presence of chromium (VI) in the aquifer that was presented in the 1998 Integrated Site Environmental Report, and also on DOE's Comment Response #50 on the Integrated Environmental Monitoring Plan, Revision 2. This response explains that the stability range defined above for chromium (VI) is from a thermodynamic perspective. In reality, the kinetics of oxidation is likely to require much higher oxygen levels and/or a catalyst to initiate the oxidation of chromium (III) to chromium (VI). If the assumption is made that the oxidation kinetics are instantaneous then the same assumption should be made for the reduction kinetics. That is, as soon as the chromium (VI) migrates outside the slightly elevated oxygen zone created by re-injection it will be reduced to chromium (IV) or chromium (III).

DOE will continue to monitor Eh and pH quarterly each year and will sample for chromium (VI) every five years in areas near re-injection. The next scheduled sampling for chromium (VI) is in 2006. Future site environmental reports will present the quarterly Eh, pH measurements collected near the re-injection wells.

Action: As stated in response.

20. Commenting Organization: Ohio EPA Commenter: GeoTrans, Inc.
Section #: Attachment A.1 Pg #: A.1-5 Line #: 18 Code: C
Original Comment #: 2
Comment: Clarify why meeting the uranium concentration limits at the Parshall Flume necessitated a stoppage of re-injection.
Response: The treated groundwater slated for re-injection was needed to blend with other site treatment plant effluents such that the composite effluent uranium concentration was low enough to maintain compliance with the 30 µg/L monthly average uranium discharge limit.
Action: No action required.

21. Commenting Organization: Ohio EPA Commenter: GeoTrans, Inc.
Section #: Attachment A.1 Pg #: A.1-6 Line #: 13 Code: C
Original Comment #: 3
Comment: The text indicates that the footnotes in the tables provide explanations for any pumping outages with more than a 24-hour duration. They do not, however, appear to include outages in all wells that lasted four days or more in April and July, and some case, other months. These outages may be maintenance-related and are indicated in the daily pumping rate data.
Response: The intent is to footnote all outages of 24 hours or longer, regardless of the cause. The footnote for the outage in July was accidentally missed. All pumping and extraction wells were inoperative from July 4, 2002 through July 7, 2002 due to a maintenance shut-down of the water treatment plant. April outages were footnoted for those wells that should have been operational.
Action: No action required.

22. Commenting Organization: Ohio EPA Commenter: GeoTrans, Inc.
Section #: Attachment A.2 Pg #: A.2-1 Line #: 25 Code: C
Original Comment #: 4
Comment: The concentration in Monitoring Well 2015 typically exceeds the FRL through its monitoring history. Table A.2-2 indicates that during 2002, the well showed no significant trend. This well has recently been abandoned because a downhole video indicated that the casing was leaking. DOE should consider installing a replacement well for 2015.
Response: DOE agrees with the comment. A replacement well for Monitoring Well 2015 will be installed during fiscal year 04.
Action: As stated in response.

23. Commenting Organization: Ohio EPA Commenter: GeoTrans, Inc.

11

Section #: Attachment A.2 Pg #: A.2-2 Line #: 26 Code: C
Original Comment #: 5

Comment: How did the Geoprobe data indicate that an additional extraction well is not needed in the off-property portion of the uranium plume at this time?

Response: The statement concerning the need for an additional extraction well in the off-property portion of the uranium plume refers to the area between the South Plume Optimization Wells and the on-property fenceline re-injection wells. Updated cross sections of the uranium plume were constructed for this area using geoprobe data collected in 2002. These updated cross sections depicted the lateral and vertical extent of the uranium plume, and showed that uranium concentrations had been reduced in response to four years of re-injection and pumping.

Groundwater modeling using the updated uranium concentrations indicated that existing extraction wells were capable of remediating the area. The decision not to install a new extraction well, though, was made with the caveat that an additional extraction well in the area of Direct-Push Location 13240 might be needed at a later date. This caveat was presented in the PSP for Direct Push Sampling South of Willey Road in 2003, which was sent to EPA and OEPA the week of March 3, 2003 and is briefly explained below.

The area northeast of the South Plume Optimization Wells (near Direct-Push Location 13240) may not be realizing the same degree of remediation as the area northwest of the optimization wells. Although groundwater modeling predicts the area will be remediated using existing extraction wells, DOE intends to re-probe this area periodically to determine if uranium concentrations are actually being lowered as modeled. Further action may be needed in the future, which includes the possibility of an additional extraction well.

Direct-push sampling in 2003 is focused on the area south of the South Plume Optimization Wells and north of the South Plume Recovery Wells. The concern is that this area may be in a stagnation zone. Further rationale for the work is presented in the PSP cited above.

Action: No action required.

24. Commenting Organization: Ohio EPA Commenter: GeoTrans, Inc.
Section #: Attachment A.2 Pg #: A.2-4 Line #: 2 Code: C
Original Comment #: 6

Comment: The water level data for all OSDF monitoring wells with the exception of 22198 is not available on the Fernald web site. Please provide electronic access to the water level monitoring data for all OSDF monitoring wells.

Response: DOE has been providing water level data from the Routine Water-Level Monitoring Program (Section 3.6.2.6 of the IEMP, Revision 3) on the IEMP Data Information Site. Well 22198 is the only OSDF well that is a part of this program. In an effort to provide more data to OEPA and EPA, DOE will provide pre-sample water level data (which is included in Appendix A, Attachment A2) on the IEMP Data Information Site beginning with July 2003 data.

Action: As stated in response.

25. Commenting Organization: Ohio EPA Commenter: GeoTrans, Inc.
Section #: Attachment A.2 Pg #: A.2-4 Line #: 10 Code: C
Original Comment #: 7

Comment: The slopes of the regression trend lines (uranium or water level versus time) do not appear to be significant. The comparison of the trend lines that was performed do not, therefore, seem to be a conclusive test for the presence/absence of a significant relationship between water levels and uranium concentration at a well. A more direct approach would be to regress the quarterly concentration data directly against the quarterly water level data.

Response: DOE agrees with the comment. There were only three instances in which both of the regression lines were significant. It should be noted that the statistical analyses with respect

to water level and uranium concentration correlations has been exploratory in nature. Due to the multiple influencing factors and the results from the statistical analyses, it is thought that performing an overall visual inspection may provide more meaningful results than continuing to perform the statistical analyses. It is important to note that statistical analyses on this relationship was performed based upon EPA request.

The commenter suggests a more direct approach such as a regression analysis of quarterly concentration data versus quarterly water level data be performed to assess the presence/absence of a significant relationship. This direct approach could not be accomplished with the existing data. The absence of paired data, especially in earlier sampling periods, prevented the use of a direct regression analysis of one variable versus the other. Additionally, it is not clear if there is a temporal "off-set" or delayed reaction between one variable and the other. For example, if there is in fact a cause-and-effect relationship, as water levels decrease it may be a few months before the actual effect on uranium levels is seen. Since this is very difficult to quantify or even properly identify, especially with the limited resolution of the quarterly sampling design, the best approach seemed to be to review overall trends.

Action: As stated in response.

26. Commenting Organization: Ohio EPA Commenter: GeoTrans, Inc.
Section #: Attachment A.2 Pg #: A.2-4 Line #: 10 Code: C
Original Comment #: 8

Comment: Some discussion of the results of the analysis is warranted. The conclusion that a meaningful correlation between water levels and concentrations exists should be tempered by a recognition of the numerous factors that also may effect concentrations. Concentration changes are at least partially a function of advection/dispersion processed that are not at all related to the water level trend. For example, if the given well is located in an area into which lower concentration groundwater is moving, concentrations would trend down ward regardless of the trend in water levels.

Response: DOE agrees with the comment.

Action: If statistical analysis continues, future reports will state that conclusions from statistical analysis should be tempered by recognizing that numerous factors may additionally effect uranium concentrations.

27. Commenting Organization: Ohio EPA Commenter: GeoTrans, Inc.
Section #: Attachment A.2 Pg #: A.2-4 Line #: 11 Code: C
Original Comment #: 9

Comment: It is not clear from the discussion provided and the analysis performed how the correlation between water levels and total uranium concentrations is "time-dependent." Specifically, the analysis did not identify periods of a given well's record when significant water level or concentration trends did exist and a correlation could be established versus periods when they did not.

Response: The use of the term "time-dependent" was meant to indicate that if data used in the analyses covered a longer time period (e.g., 1988-2002) versus a shorter time period (e.g., 2000-2002), the outcome from the statistical results could be different.

Action: No action required.

28. Commenting Organization: Ohio EPA Commenter: GeoTrans, Inc.
Section #: Attachment A.3 Pg #: A.3-1 Line #: 23 Code: C
Original Comment #: 10
Comment: The text is misleading because it presents the BRSR 10-year, uranium-based restoration footprint without qualification. The IEMP dated January 2003 indicates that the current groundwater remediation design is modified from the BRSR design and, therefore, the restoration footprint presented in the BRSR is no longer applicable to the remedy. The text should discuss progress in updating the footprint and why it is not updated for this report.
Response: In future reports, any use of a modeled groundwater restoration footprint or modeled groundwater capture zone will be qualified as to its source.

Updating the restoration footprint was deferred to completion of the South Field Phase II Module. Components of this module did not become operational until July of 2003. With completion of this module most major components of the aquifer remediation system are now in place.

DOE plans on using the predicted capture zone derived from more current (i.e., 2003) pumping conditions in the 2003 Site Environmental Report in place of the BRSR footprint.
Action: As stated in response.

29. Commenting Organization: Ohio EPA Commenter: GeoTrans, Inc.
Section #: Attachment A.4 Pg #: A.4-2 Line #: 35 Code: C
Original Comment #: 11
Comment: The text is incorrect in stating that Nickel was a "<" constituent in one or more aquifer zones. It is designated as ">N" in all five aquifer zones.
Response: DOE agrees with the comment. Nickel is designated ">N" in all five aquifer zones. This mistake does not affect the outcome of the discussion where it was made. The purpose of the discussion was to point out any "<" designated constituents that had an exceedance in 2002 and might need to be re-categorized to ">."
Action: In future reports, care will be taken to ensure the correctness of statements.

30. Commenting Organization: Ohio EPA Commenter: GeoTrans, Inc.
Section #: Attachment A.5 Pg #: A.5-7 Line #: 2 Code: C
Original Comment #: 12
Comment: To improve the clarity of this discussion, the term "Combined" should be changed to "Overall" to make the text consistent with the summary table (or vice versa).
Response: DOE agrees with the comment.
Action: In future reports, the term "overall" will be used instead of "combined" for consistency.

31. Commenting Organization: Ohio EPA Commenter: GeoTrans, Inc.
Section #: Attachment A.5 Pg #: A.5-9 Line #: 33 Code: C
Original Comment #: 13
Comment: The inverse correlation noted may not be meaningful because other factors (e.g., advective/dispersive mass transport) may be causing the observed trend.
Response: Refer to Comment Response #26.
Action: Refer to Action #26.

32. Commenting Organization: Ohio EPA Commenter: GeoTrans, Inc.
Section #: Attachment A.5 Pg #: A.5-10 Line #: 22 Code: C
Original Comment #: 14
Comment: According to "Technical Memorandum for the On-Site Disposal Facility Cells 1, 2, and 3 Baseline Groundwater Conditions" Section 5.2.1 entitled Post-Baseline Monitoring, the 16 leak detection indicator constituents were to be analyzed in annual samples collected from the LDS. The results of these analyses should also be discussed in this section.

Response: The 16 leak detection indicator constituents were sampled more frequently than annually in 2002. The approval for changing the sampling protocol for the OSDF based on the technical memorandum was implemented in August 2002. Thus prior to August 2002, the 16 leak detection indicators constituents were analyzed quarterly in the Cells 1, 2, and 3 LDS locations. Monitoring results from the locations were summarized in Table A.5-4. Table A.5-4 like Tables A.5-1 through A.5-3 summarize those constituents from the 16 sampled that had greater than 25 percent detections. Future reports will thoroughly evaluate the annual results from the LDS and a summary discussion on the 16 leak detection indicator constituents along with the 67 additional constituents sampled in the LCS.

Action: As stated in response.