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MAY 23 1997

DOE-0981-97

Mr. James A. Saric, Remedial Project Director
U.S. Environmental Protection Agency
Region V-SRF-5J
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 U.S. ENVIRONMENTAL PROTECTION AGENCY AND OHIO ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE DRAFT FINAL INTEGRATED ENVIRONMENTAL MANAGEMENT PROJECT, RESPONSE TO THE OHIO ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE DRAFT FINAL ON-SITE DISPOSAL FACILITY GROUNDWATER/LEAK DETECTION AND LEACHATE MONITORING PLAN

References:

1) Letter, J. Saric, U.S. EPA to J. Reising, DOE-FEMP, "Draft Final IEMP," dated April 24, 1997.

2) Letter, T. Schneider, OEPA to J. Reising, DOE-FEMP, "Comments-Integrated Environmental Monitoring Plan," dated April 10, 1997.

3) Letter, T. Schneider, OEPA to J. Reising, DOE-FEMP, "Comments OSDF GW Monitoring Plan," dated April 10, 1997.

4) Letter, J. Saric, U.S. EPA to J. Reising, DOE-FEMP, "OSDF Leachate Monitoring Plan," dated April 24, 1997.

This letter serves to submit the subject responses for your review and approval. The comments were provided in References 1, 2, and 3. Only the responses to comments are being submitted at this time per agreement reached during the May 20, 1997, weekly

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Department of Energy, Fernald Environmental Management Project (DOE-FEMP), U.S. Environmental Protection Agency (U.S. EPA), and Ohio Environmental Protection Agency (OEPA) conference call. Once your concurrence on the comment responses and associated actions is received, the documents will be submitted in final form. Note that for the OSDF Groundwater/Leak Detection and Leachate Monitoring Plan, the U.S. EPA approved the Draft Final Plan without comment (Reference 4).

With the U.S. EPA and OEPA concurrence, DOE would like to begin implementation of the IEMP in July of this year. An implementation schedule for the IEMP Air Monitoring Program will be submitted to you by June 13, 1997. The schedule will reflect the DOE's intention of having all monitors installed and operational by January 1998 so that the original modeling-based approach will be used consistently throughout 1997, and the alternate monitoring-based approach will commence January 1998.

Should you have any questions regarding this submittal, please contact Kathleen Nickel at (513) 648-3166.

Sincerely,

Johnny Reising

Johnny W. Reising
Fernald Remedial Action
Project Manager

FEMP:Nickel

Enclosure: As Stated

cc w/enc:

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RESPONSES TO OHIO EPA COMMENTS ON THE GROUNDWATER/LEAK DETECTION AND LEACHATE MONITORING PLAN FOR THE ON-SITE DISPOSAL FACILITY

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

MAY 1997

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

RESPONSE TO OHIO EPA COMMENTS ON THE GROUNDWATER/LEAK DETECTION AND LEACHATE MONITORING PLAN FOR THE ON-SITE DISPOSAL FACILITY

1. Commenting Organization: Ohio EPA Commentor: HSI GeoTrans
Section#: 4.3.3 Pg.#: 4-6 Line#: 18-20 Code: C
Original Comment#: 1
Comment: The statement implies that leakage through the groundwater sumps is the first failure mechanism of the cells. We agree that the monitoring system should be designed to monitor the presence of leachate from the OSDF at first entry point into the environment; however, it possible that leakage along the pipe penetrations through the liner is just as likely a failure mechanism as leakage from the sumps themselves. The location of the horizontal wells is not ideal to monitor leakage from the pipe penetrations. The text should be revised to indicate this.
Response: The "sumps" actually are the pipe penetrations through the liner discussed in the comment above. The term "sump" has been used throughout the OSDF design process and has been carried over from the initial phase of the OSDF design. The term currently refers to the locations where the LCS and LDS pipes penetrate the compacted clay liner, and will continue to be used for ease of reference. The text in Section 4.3.1 will be revised to clarify the definition of "sumps" as described above. Note that the detailed design of the LCS, LDS and horizontal well construction is presented in the OSDF design package, as stated on pg. 4-3, lines 12-13.
Action: Revise the text on pg. 4-3, lines 18-21, to read as follows:
"Both the LCS and LDS layers will each drain to the west within each cell. At the western edge of each cell liner, any liquid within the LCS and LDS is collected via extraction pipes penetrating the compacted clay liner. The points where the LCS and LDS extraction pipes penetrate the compacted clay liner are referred to as "sumps" throughout this plan. The "sumps" represent the areas with the greatest leak potential for each cell and is considered the primary location where a leak would first enter the environment if a leak were to occur."

2. Commenting Organization: Ohio EPA Commentor: OFFO
Section#: 4.3.4.2 Pg.#: 4-10 Line#: 14 Code: C
Original Comment#: 2
Comment: We can only count 20 wells in Figure 4-2. Is there another well located to the north of the OSDF?
Response: The correct number of wells is 20, as depicted in Figure 4-2.
Action: Change the number on pg. 4-10, line 14, from "21" to "20".

3. Commenting Organization: Ohio EPA Commentor: HSI GeoTrans
Section#: 4.3.4.3 Pg.#: 4-11 Line#: 24-34 Code: C
Original Comment#: 3
Comment: Why is the loading chosen as the maximum allowed in the aquifer by the OSDF WAC? As this is a leak detection system, it seems overly presumptuous that the cell will properly operate, whereas the purpose of the wells in the GMA are intended to monitor for leaks to the groundwater.
Response: The intention of this aspect of the modeling was to verify that the proposed down gradient GMA monitoring well spacing is sufficient to detect the minimum contaminant plume of concern in the aquifer (i.e., a plume with a maximum concentration equal to the FRL). A

plume with this concentration would have the minimum areal extent and, as shown in the modeling results, would be detected by the down gradient GMA monitoring wells. For the purposes of selecting the proper monitoring well density, such a loading concentration would be conservative. Increased concentrations above the amount loaded in the model would only result in a larger plume. Since the modeling results shows that the minimum plume of concern is detectable with the proposed GMA monitoring well spacing, no further modeling effort or assumptions about OSDF cell performance is required. To address the above comment, the text will be revised to clarify the reasoning for selecting the loading concentration.

To predict whether or not the width of a small plume would be detected from a release located at the east side of a cell, additional modeling was done. The same modeling run for a hypothetical leak located at the east side of the cell is more conservative than modeling a leak from the west side of the cell because: 1) it does not assume that leaks can only occur at the leachate "sumps" (extraction pipe penetration points), and 2) it does not allow (more detectable) plume widening by the time the plume reaches the proposed monitoring locations. Again, given the width of the minimum plume of concern, the modeling results demonstrate that the proposed GMA monitoring well spacing is sufficient to detect a leak from the cell. The results are shown in Figures 4-6 and 4-7, attached.

Action: Replace the paragraph on pg. 4-11, lines 25-34, with the following:
"The SWIFT groundwater model was used to predict if the density of downgradient GMA monitoring wells is adequate to detect the smallest contaminant plume resulting from a leak in the OSDF which would be of concern. A leak from OSDF Cell 3 was simulated for both uranium and technetium-99. Constant loading from the cell was simulated throughout the model run such that a plume of minimum areal extent (i.e., a plume with maximum concentration equal to the FRL) was maintained in the GMA. Hypothetical plumes of 20 ppb and 94 pCi/L were maintained for uranium and technetium-99, respectively. The plumes were loaded from two hypothetical locations. One location was approximated to be below the "sump" at the western edge of Cell 3, to represent the most likely leakage point from the cell. The other location was further east, to provide a more conservative scenario where the plume would be less able to expand by the time the leading edge would reach the downgradient monitoring well.

The modeling results for uranium at model year 55 (2051) and for technetium-99 at model year 30 (2026) are shown in Figures 4-6 and 4-7, respectively. The durations were determined from the modeling, and represent the period of time under constant loading for the respective plumes to disperse to the width of the spacing distance between monitoring wells (approximately equal to the OSDF cell width). Modeling results indicate that the density of downgradient GMA monitoring wells is sufficient to detect this minimal plume given the lateral expansion and the plume width under this minimal constant loading."

Add the eastern plume to Figures 4-6 and 4-7.

4. Commenting Organization: Ohio EPA Commentor: HSI GeoTrans
Section#: 4.3.4.3 Pg.#: 4-16 Line#: 1-2 Code: C
Original Comment#: 4
Comment: The groundwater transport model does not offer the level of resolution to support the statement that the "plume boundary does not extend beyond the OSDF cell footprint." The groundwater model cell dimensions are 125 ft and the OSDF cells are approximately 500 x 750 ft. This provides a reasonable level of discretization for lateral movement; however, the vertical grid is much too coarse to represent the migration. Vertical cell

dimensions of 10 and 20 feet are too coarse to capture the plume's entrance at the water table. A grid on the order of a few feet would be required in order to use modeling results to support this statement.

Response: Comment acknowledged. While increasing the vertical resolution would better capture the plume's entrance to the water table and ultimately give a more refined plume representation, the objective of the GMA monitoring wells is to detect the presence of any contaminant that has already entered the groundwater. Any detection of a target analyte which shows an increasing trend would trigger further groundwater sampling to characterize the nature and extent of contamination. Since these wells were designed only to detect the presence of contaminants which could potentially leak from the cell, they were located by considering only groundwater flow directions in the area and, as demonstrated through modeling, are in optimum locations for this purpose. Regardless, the statement on lines 1-2 referred to by the commentor is not pertinent to the intent of the paragraph, and will therefore be deleted. The paragraph will then refer only to the width of the plumes in relation to the monitoring well density.

Action: Delete the sentence on lines 1-2, pg. 4-16. Delete "furthermore," from the beginning of the sentence on line 3, pg. 4-16.

5. Commenting Organization: Ohio EPA Commentor: HSI GeoTrans
Section#: 4.3.4.3 Pg.#: 4-16 Line#: 3-5 Code: C
Original Comment#: 5

Comment: Based on the groundwater modeling results, it is not appropriate to conclude that only one monitor well will be sufficient for each disposal cell. The groundwater transport model does not include local heterogeneity (on the order of tens or even hundreds of feet) needed to support this. In light of the variations in the recent South Plume geoprobe data and the samples taken at nearby monitor wells, one should expect significant (probably ranging at least an order of magnitude) variations in water concentrations values for wells spaced a few hundred feet apart. Thus while the model represents these areas as nearly uniform concentration levels, it is not prudent to determine monitor well spacing strictly from the model results.

Response: Monitoring well spacing and locations were not selected strictly using modeling results. All of the best available information for the aquifer properties in the area of the OSDF were considered. The groundwater model was used as a tool to supplement the available information and to assist in well placement. DOE maintains that the modeling results accurately represent the contaminant migration that would be expected to occur in the aquifer in the area of the OSDF under conservative assumptions. If a leak from the OSDF is ever detected, then further investigation may be warranted. In such a case it would be appropriate to investigate the variability of contaminant concentrations in the aquifer as part of a Groundwater Assessment Monitoring Program.

Action: No action required.

6. Commenting Organization: Ohio EPA Commentor: HSI GeoTrans
Section#: 4.3.4.3 Pg.#: 4-16 Line#: 3-5 Code: C
Original Comment#: 6

Comment: The sump locations and particle locations should be noted as only be approximate locations. In Figures 4-4 and 4-5, the locations of particles reflect the 125 ft grid spacing using in the SWIFT groundwater model. This should be noted in the figure and text. Furthermore, it would appear that the choice of initial particle locations could be improved for cells 1 (move one block east), 6 and 7 (move one block west).

Response: DOE agrees that the text should indicate the 125 ft. grid spacing and that the sump locations are approximate. However, the selected grid location, given the grid orientation

and spacing, is the best approximation for the "sump" location. The orientation of the model grid is northwest-southeast and northeast-southwest. The grid spacing and orientation is depicted in Figures 4-4 and 4-5, attached. Given this orientation, one-block movements suggested by the commentor would not yield results that would alter the selected well location.

Action: Add "approximated" before "sump location in Cell #3" on line 26, pg. 4-11. Add "using 125 foot grid spacing" to the end of the sentence ending on line 28, pg. 4-11.

Add "Note: Grid spacing = 125-ft" to Figures 4-4, 4-5, 4-6 and 4-7.

7. Commenting Organization: Ohio EPA Commentor: HSI GeoTrans
Section#: 4.4.2.3 Pg.#: 4-21 Line#: 18-21 Code: C
Original Comment#: 7

Comment: Measurement of the volume of water produced by the horizontal wells will be important in determining if leakage from the OSDF is occurring. An accurate method of measurement of the fluid volume produced at each well should be described. These volumes should be recorded and plotted versus time for evaluation of potential leaks. A discussion of this should also be included in Section 4.6 Leak Evaluation Strategy.

Response: Water volume measurements in the horizontal wells will be measured and recorded to assist in the holistic approach in detecting a leak. The method used to calculate the volume of water is described in Appendix B, Sampling and Analysis Requirements, pg. B-1, and will result in accurate estimates of water volume in the well. Note that if a larger than expected volume of water is in the horizontal well, it will not automatically be assumed that a leak from the OSDF has occurred. All existing chemical and volume/flow data from each of the four tiers of the monitoring system must be evaluated to make this determination.

Action: Add the following text to the paragraph ending on line 27, pg. 4-21:
"However, if water exists in the well, it will not be directly inferred that a leak has occurred, and water volume measurements will be taken and plotted versus time to assist in the holistic approach of determining a leak."

Revise the sentence on lines 16-17, pg. 4-37, Section 4.6.2, to:
"Analyte concentrations and volume versus time plots of groundwater collected from the till monitoring wells will be correlated with LCS and LDS data to detect a leak in the secondary composite liner system that contains the three-foot compacted clay liner."

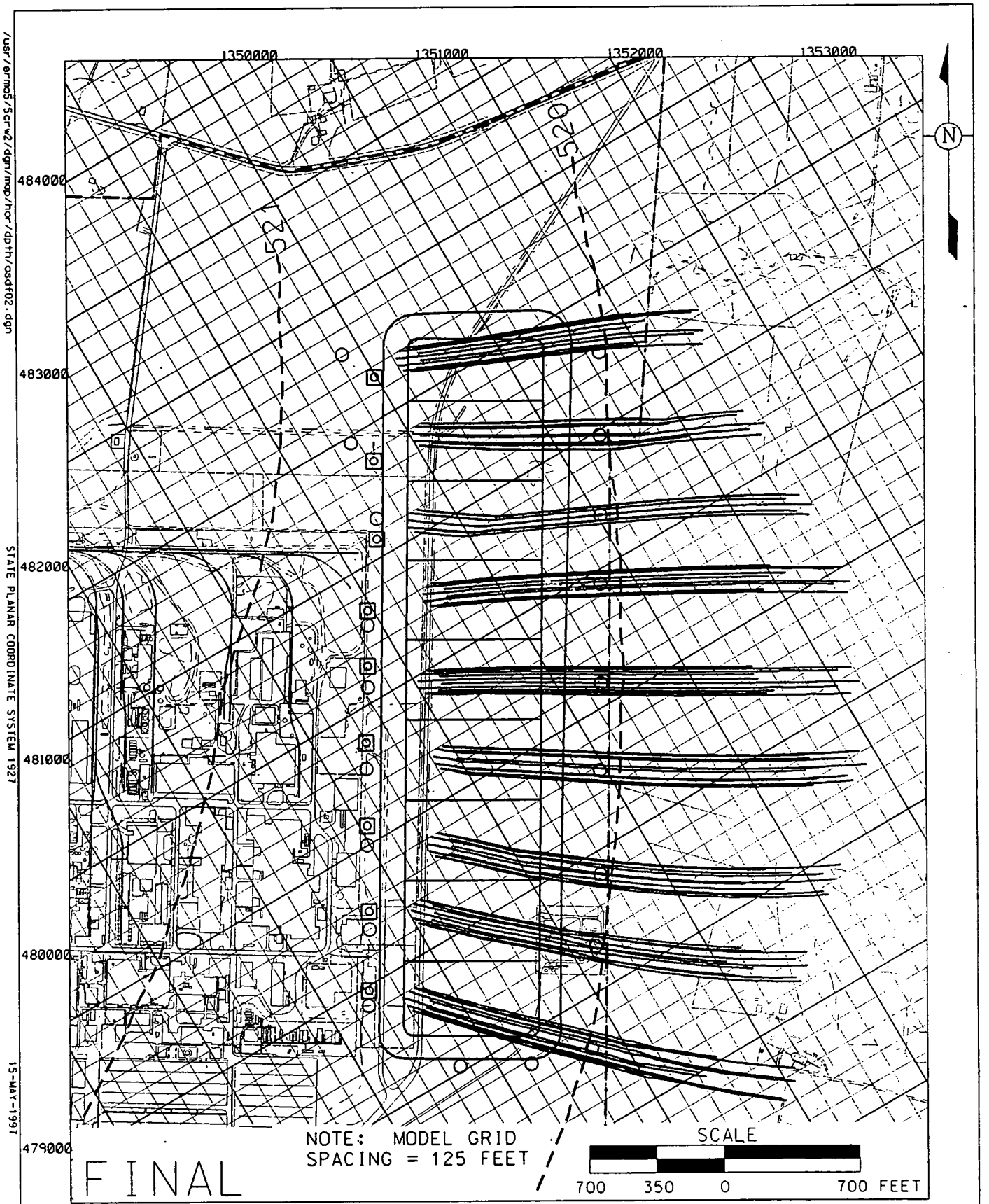
8. Commenting Organization: Ohio EPA Commentor: HSI GeoTrans
Section#: 4.0 Pg.#: 4-21 Line#: 15 Code: C
Original Comment#: 8

Comment: Additional explanation regarding the assessment of seasonality in the groundwater data should be provided. Specifically, an estimation of the number of quarters of data needed to establish seasonal trends should be provided.

Response: Agree. Four quarters of sampling over one year are generally accepted for providing seasonal variation in groundwater chemistry. As discussed in Section 4.4.3, Future Considerations, the OSDF Groundwater/Leak Detection and Leachate Monitoring Plan proposes quarterly sampling after baseline is established until future conditions warrant otherwise. Examples of such future conditions would be after closure of the OSDF and after completion of aquifer restoration. At those times, it would be appropriate to evaluate the possibility of either increasing or reducing the quarterly sampling freqeuncy. Note that the baseline sampling will include approximately one year of monthly sampling events, which will also provide data sufficient to determine seasonal variation.

Action: Add the following after the sentence ending on line 15 and before the sentence beginning on line 16, on pg. 4-21:
"Four quarters of sampling over one year are generally accepted for providing seasonal variation in groundwater chemistry. Because of the existing contamination in the Great Miami Aquifer and the perched groundwater and the current remediation underway site-wide, the sampling frequency will be quarterly until future conditions warrant otherwise (see Section 4.4.3 below)."

Insert the following after "comparisons" and "The need for" on line 13, pg. 4-22:
"After upgradient conditions are established through a more frequent sampling interval (if used), a reduction of the sampling frequency to semiannual will be considered, particularly if the quarterly sampling results do not reveal any seasonal variation beyond what would be revealed by semiannual sampling results."



LEGEND:

- PROPOSED OSDF GMA DETECTION MONITORING WELL
- PROPOSED OSDF TILL DETECTION HORIZONTAL MONITORING WELL SAMPLING POINT
- FEMP BOUNDARY
- MODELED GROUNDWATER ELEVATION (AMSL)
- 10 YEAR PARTICLE TRACKS (NO RETARDATION)

FIGURE 4-4. POST REMEDIATION SCENARIO

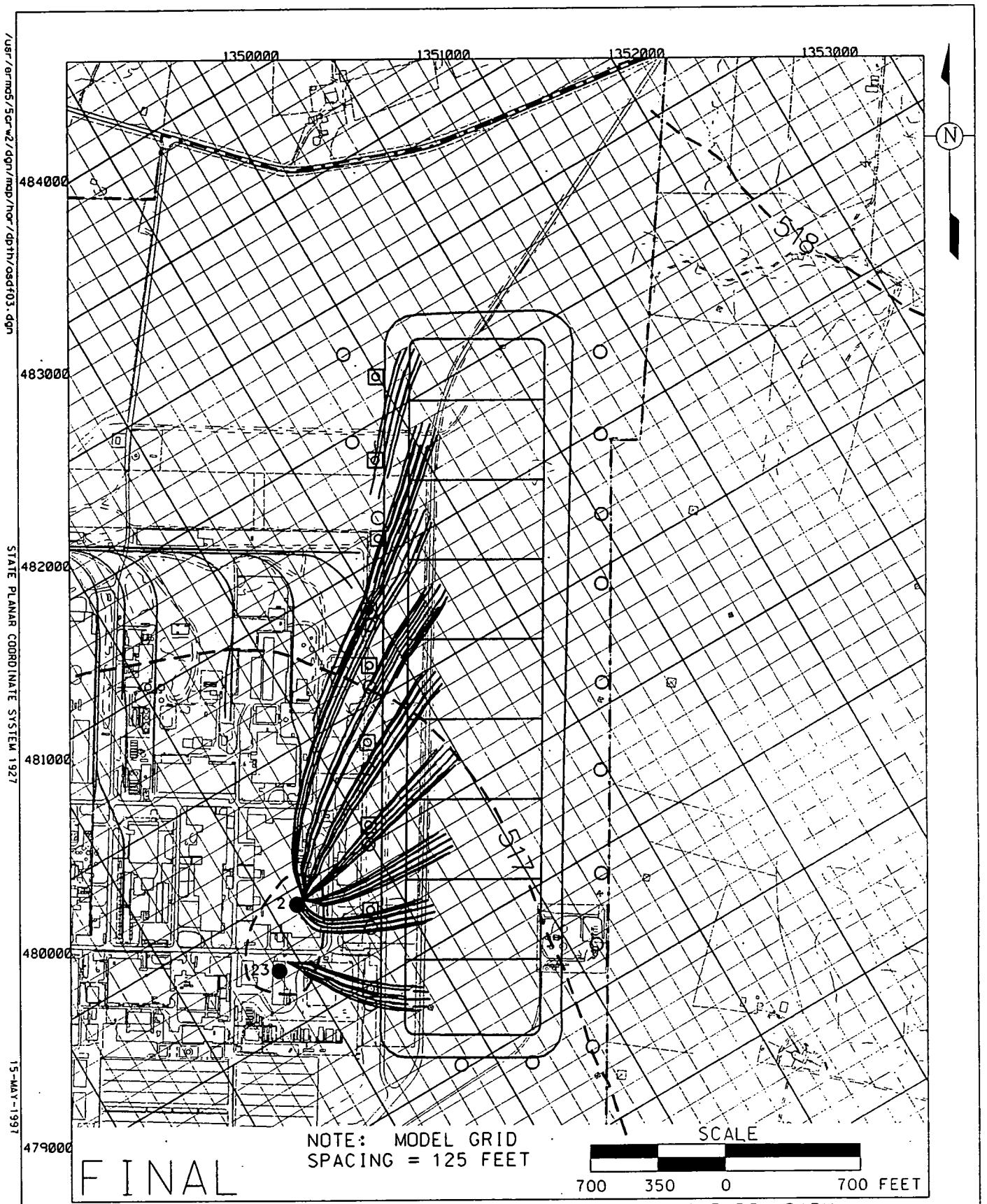


FIGURE 4-5. PLANT 6 PUMPING SCENARIO

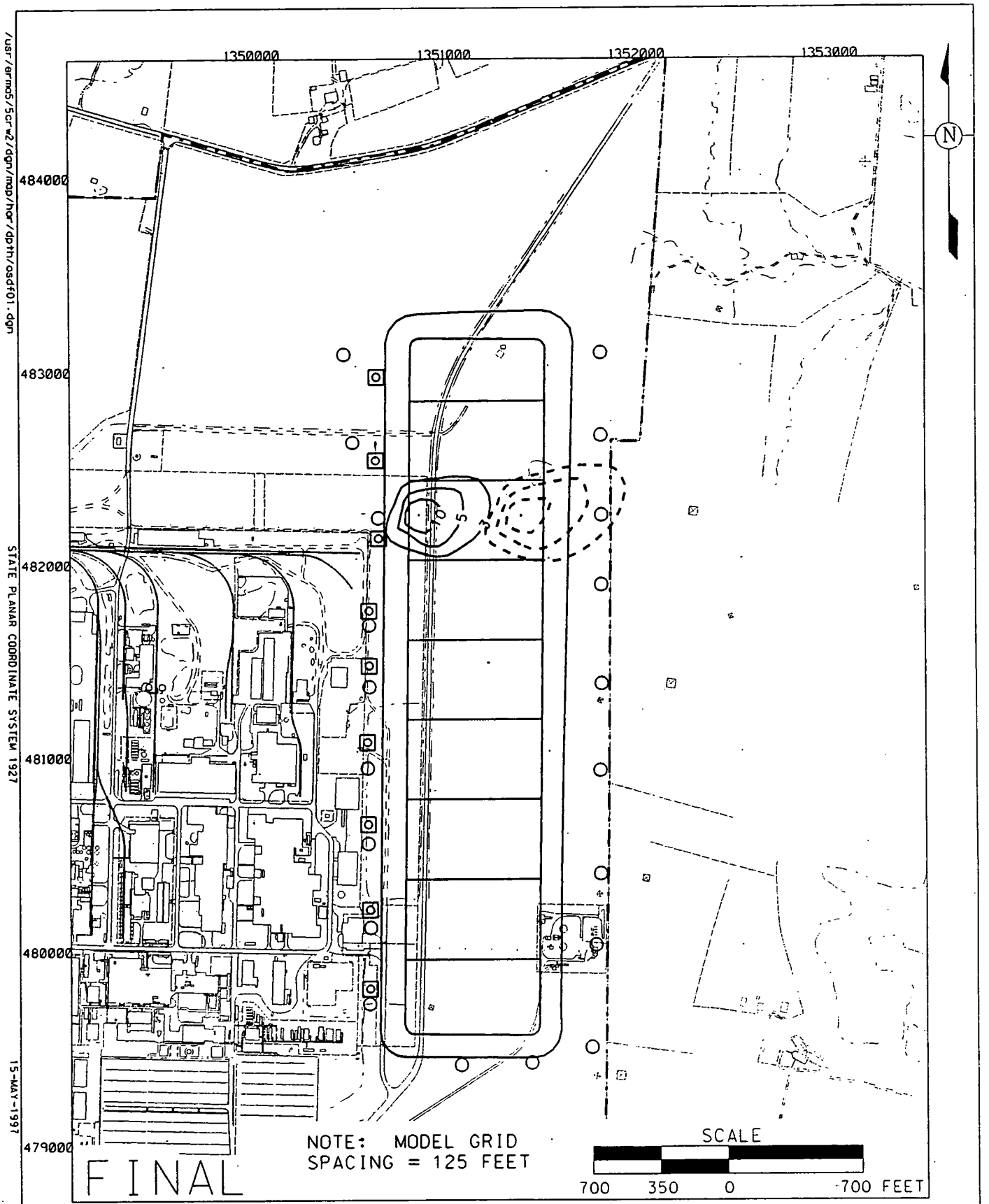


FIGURE 4-6. SWIFT MODELING WITH URANIUM LOADING - 55 YEARS

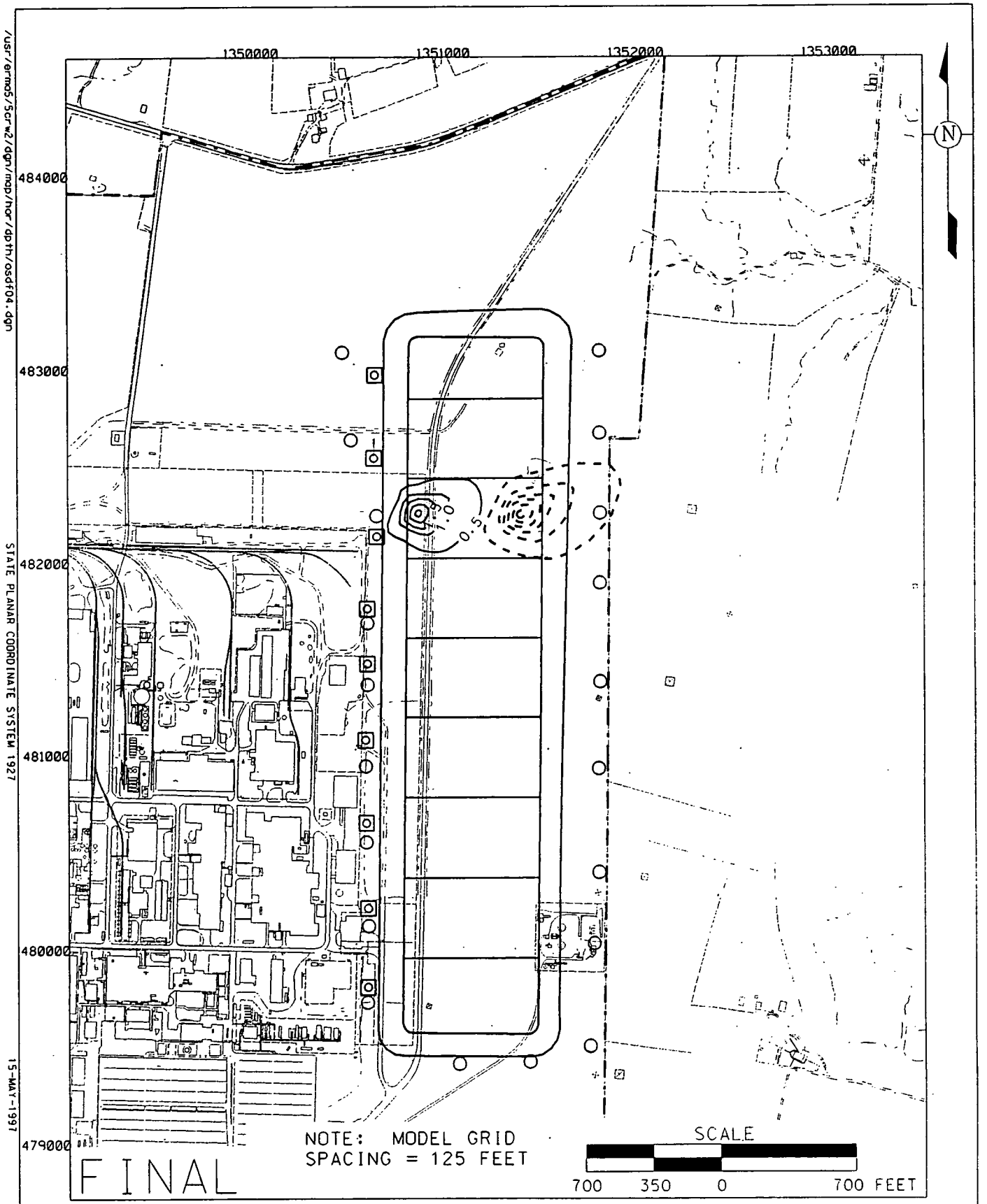


FIGURE 4-7. SWIFT MODELING WITH TECH 99 LOADING - 33 YEARS