NATIONAL ENRICHMENT FACILITY

10 CFR 30.6
10 CFR 40.5
10 CFR 70.5

May 20, 2004

NEF#04-019

ATTN: Document Control Desk
Director
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Louisiana Energy Services, L. P.
National Enrichment Facility
NRC Docket No. 70-3103

Subject: Response to NRC Request for Additional Information Regarding the National Enrichment Facility Environmental Report

References:

1. Letter NEF#03-003 dated December 12, 2003, from E. J. Ferland (Louisiana Energy Services, L. P.) to Directors, Office of Nuclear Material Safety and Safeguards and the Division of Facilities and Security (NRC) regarding "Applications for a Material License Under 10 CFR 70, Domestic licensing of special nuclear material, 10 CFR 40, Domestic licensing of source material, and 10 CFR 30, Rules of general applicability to domestic licensing of byproduct material, and for a Facility Clearance Under 10 CFR 95, Facility security clearance and safeguarding of national security information and restricted data"

2. Letter NEF#04-002 dated February 27, 2004, from R. M. Krich (Louisiana Energy Services, L. P.) to Director, Office of Nuclear Material Safety and Safeguards (NRC) regarding "Revision 1 to Applications for a Material License Under 10 CFR 70, "Domestic licensing of special nuclear material," 10 CFR 40, "Domestic licensing of source material," and 10 CFR 30, "Rules of general applicability to domestic licensing of byproduct material"

3. Letter dated April 29, 2004, from M. Wong (NRC) to R. Krich (Louisiana Energy Services) regarding "Request for Additional Information Related to the Preparation Of An Environmental Impact Statement For The Louisiana Energy Services Proposed National Enrichment Facility"

By letter dated December 12, 2003 (Reference 1), E. J. Ferland of Louisiana Energy Services (LES), L. P., submitted to the NRC applications for the licenses necessary to authorize construction and operation of a gas centrifuge uranium enrichment facility. Revision 1 to these applications was submitted to the NRC by letter dated February 27, 2004 (Reference 2). By letter dated April 29, 2004 (Reference 3), the NRC requested additional information and

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clarifications regarding the Environmental Report be provided within 15 working days (i.e., by May 20, 2004).

The Reference 3 letter includes the NRC Request for Additional Information (RAI) covering the National Enrichment Facility (NEF) Environmental Report (ER). This letter transmits the LES responses to these requests.

Enclosure 1 to this letter provides a compact disc (CD-ROM) containing an electronic version of the LES responses and associated tables and figures referenced in the various responses as requested in the Reference 3 letter.

Enclosure 2 to this letter provides a CD-ROM containing a sample calculation to allow the NRC to reproduce the site score results in ER Section 2.1.3.3, XOQDOQ model input files used to generate the air quality impact data from the proposed NEF operation in ER Section 4.6.2.3, and meteorological data supplied by Waste Control Specialists as requested in RAI 2-7A, RAI 4-4A, and RAI 4-11A, respectively.

Attachment 1 to this letter provides the RAIs with the associated LES response.

Attachment 2 to this letter provides Tables referenced in various RAI responses.

Attachment 3 to this letter provides Figures referenced in various RAI responses.

Attachment 4 to this letter provides a copy of a letter dated March 12, 2004, from J. Mace (US Army Corps of Engineers) to G. Harper (Framatome-ANP) regarding the absence of Corps of Engineers' jurisdictional waters on the NEF site.

Attachment 5 to this letter provides a copy of a letter dated April 13, 2004, from R. Krich (Louisiana Energy Services, L.P.) to J. Parker (New Mexico Environment Department) regarding "Registration of X-Ray Radiation Machines for the National Enrichment Facility."

Attachment 6 to this letter provides documents requested in various RAIs.

If you have any questions, please contact me at 630-657-2813.

Respectfully,

Daniel G. Horn for

R. M. Krich
Vice President – Licensing, Safety, and Nuclear Engineering

Enclosures:

1. CD-ROM – LES Responses to April 29, 2004, Requests for Additional Information.

2. CD-ROM – Data Files Provided in Response to Requests.

Attachments:

1. LES Responses to April 29, 2004, Request for Additional Information.

2. LES Responses to April 29, 2004, Request for Additional Information: Tables Referenced from Responses.

3. LES Responses to April 29, 2004, Request for Additional Information: Figures Referenced from Responses.

4. LES Responses to April 29, 2004, Request for Additional Information: Letter Dated March 12, 2004, from J. Mace (US Army Corps of Engineers) to G. Harper (Framatome-ANP) Regarding the Absence of Corps of Engineers' Jurisdictional Waters on the NEF Site.

5. LES Responses to April 29, 2004, Request for Additional Information: Letter Dated April 13, 2004, from R. Krich (Louisiana Energy Services, L.P.) to J. Parker (New Mexico Environment Department) Regarding "Registration of X-Ray Radiation Machines for the National Enrichment Facility."

6. LES Responses to April 29, 2004, Request for Additional Information: Documentation Supplied in Response to Requests.

cc: T.C. Johnson, NRC Project Manager (w/o Attachments) (w/o Enclosures)
M.C. Wong, NRC Environmental Project Manager

ATTACHMENT 1

Louisiana Energy Services
Response to April 29, 2004,
Request for Additional Information

Louisiana Energy Services (LES)
Responses to April 29, 2004
Requests for Additional Information

SECTION 1 – INTRODUCTION

Pursuant to 10 CFR 51.45(d), the ER is required to list all the Federal permits, licenses, approvals or other entitlements which must be obtained in connection with the proposed action.

1-1 Permits, Licenses, and Approvals:

A. Provide an update on the status of required permits, licenses and approvals, if available, for the construction and operation of the proposed National Enrichment Facility (NEF). For example, identify any specific air quality permits required by the State of New Mexico. Provide the bases for each such permits.

B. Identify any applicable New Mexico regulations, permits, licenses, or approvals that would be required because of the State Land Swap Arrangement.

- Section 1.2.1 states that the proposed NEF site is currently owned by the State of New Mexico and is being acquired by Louisiana Energy Services (LES) through a State Land Swap Arrangement.

C. Verify that the proposed septic tanks and leach fields would comply with applicable permits, licenses or approvals.

LES Response

A. The following is a status update of those permits required for the NEF. LES will incorporate this update of the status of the required permits, licenses, and approvals in the next revision to the NEF Environmental Report (ER).

National Pollutant Discharge Elimination System (NPDES) Industrial Storm Water Permit

The NEF is eligible to claim the "No Exposure" exclusion for industrial activity of the NPDES storm water Phase II regulations. As such, LES could submit a No Exposure Certification immediately prior to initiating operational activities at the NEF site.

LES also has the option of filing for coverage under the Multi-Sector General Permit (MSGP) because the NEF is one of the 11 eligible industry categories. If this option is chosen, LES will file a Notice of Intent (NOI) with the US Environmental Protection Agency (EPA), Washington, D.C., at least two days prior to the initiation of NEF operations.

A decision regarding which option is appropriate for the NEF will be made in the near term and reflected in a revision to the ER.

NPDES Construction Storm Water Permit

The LES will file for coverage under the NPDES Construction General Permit (CGP). LES will develop a Storm Water Pollution Prevention Plan (SWPPP) and file a Notice of

Intent (NOI) with the US EPA, Washington, D.C., at least two days prior to the commencement of construction activities.

Development of the SWPPP or submittal of the NOI has not yet been completed because it is too early in the regulatory process.

US Army Corp of Engineers Section 404 Permit

By letter dated March 17, 2004, provided as Attachment 4 to this submittal, the US Army Corp of Engineers has notified LES of its determination that there are no jurisdictional waters at the NEF site. Therefore, a Section 404 Permit is not required.

New Mexico Section 401 Permit

The State of New Mexico and the US Army Corp of Engineers have a cooperative agreement between them. Because jurisdictional waters were not identified at the site, a Section 401 Permit is not required.

New Mexico Air Permit

The NEF does not emit levels of air emissions that meet the conditions under New Mexico regulation 20.2.70 NMAC (New Mexico Administrative Code), Operating Permits, which would require an air quality operating permit. The NEF will have emissions for non-exempt equipment below ten (10) pounds per hour and less than twenty-five (25) tons per year of any regulated air contaminant for which there are national or state standards, the threshold limits for which a construction permit would be required. Even though below the threshold limits, LES has prepared and filed a Notice of Intent (NOI) with the New Mexico Air Quality Bureau. The NOI is presently being reviewed by the bureau.

National Emission Standards for Hazardous Air Pollutants (NESHAPs)

The NEF is not subject to any of the standards established by the Clean Air Act for National Emission Standards for Hazardous Air Pollutants (NESHAPs). NEF emission of any hazardous air pollutant is below the regulatory limit. This is also the case under New Mexico regulation 20.2.78 NMAC, Emission Standards for Hazardous Air Pollutants, which has adopted the federal EPA standards by reference.

New Mexico Ground Water Discharge Permit/Plan

LES has prepared and submitted to the New Mexico Water Quality Bureau (NMWQB) a Ground Water Discharge Permit/Plan application for the NEF site. The application includes the NEF septic tanks and leachfields as part of 20.6.2.5000 NMAC, Underground Injection Control. The application is presently undergoing NMWQB review.

New Mexico Hazardous Waste Permit

The State of New Mexico adopted Resource Conservation Recovery Act laws by reference as state hazardous waste regulations under 20.4.1 NMAC, Hazardous Waste Management. LES will be required to file a US EPA Form 8700-12, Notification of Regulated Waste Activity, prior to the generation of materials meeting hazardous waste

criteria. The NEF will be classified as a Small Quantity Generator and, therefore, will not require a hazardous waste permit. The notification has not yet been filed because it is too early in the regulatory process.

EPA Waste Activity EPA Identification (i.e., ID) Number

This ID number is received after filing the Notification of Regulated Waste Activity (US EPA Form 8700-12) discussed in the New Mexico Hazardous Waste Permit above.

Machine-Produced Radiation Registration

By letter dated April 13, 2004, provided as Attachment 5 to this submittal, LES has notified the State of New Mexico Radiation Control Bureau that they will register NEF X-Ray equipment prior to use. However, the equipment specifications are not available at this time. Therefore, this registration will occur at a future date.

Rare, Threatened and Endangered Species Survey Permit

No permit is required to conduct rare, threatened and endangered species surveys unless the survey is on Bureau of Land Management lands. The initial survey has been completed for the Lesser Prairie Chicken and the results of the confirmatory survey are being provided to the State of New Mexico, the US Fish and Wildlife Service, and the NRC. The initial survey for the Sand Dune Lizard was performed in October 2003 and was submitted to the State of New Mexico, the US Fish and Wildlife Service, and the NRC. A confirmatory survey for the Sand Dune Lizard will be completed during the summer of 2004 and the results provided to the State of New Mexico, the US Fish and Wildlife Service, and the NRC.

Right-of Entry Permit

The New Mexico State Land Office (NMSLO) issues a right-of-way permit for trespass on state lands. This permit has been obtained by LES.

Class III Cultural Survey Permit

The permit is issued by the New Mexico State Historic Preservation Officer (SHPO) and has been obtained by the cultural resources contractor.

B. The New Mexico State Land Office (NMSLO) land exchange procedures require that an environmental assessment (EA) and a cultural resources survey be conducted on lands offered for exchange. Currently, LES is evaluating different candidate properties by applying the criteria in the land exchange procedures. Once a decision has been made on which piece or pieces of land will be offered in exchange, LES will purchase the properties and then convey them to Lea County for re-conveyance to the NMSLO. The EA and cultural resources survey reports will be submitted by Lea County to the NMSLO as part of the exchange package.

C. The proposed septic tanks and leachfields comply with the definition of 20.6.2.5000 NMAC, Underground Injection Control, and are included in the ground water discharge permit application that was filed with the State of New Mexico Environment Department (NMED) Ground Water Quality Bureau by LES. The ground water discharge permit

application is presently under review by NMED. The ground water discharge permit is the only state permit required for a septic tank and leachfield system with a discharge greater than 7,571 liters per day (2,000 gallons per day). There are no permits required from the community of Eunice because the septic tanks and leachfields are located outside of city zoning limits. Lea County, New Mexico, does not have a formal zoning and planning department and does not issue permits for septic systems. Lea County defers their authority to the State of New Mexico for permitting septic systems.

SECTION 2 – ALTERNATIVES

Pursuant to 10 CFR 51.45(b), the ER is required to contain a description of the proposed action and 10 CFR 51.45(b)(3) requires that the ER discuss the alternatives to the proposed action. The discussion of each alternative, including the proposed action, should be sufficiently complete to assist the NRC staff in developing and exploring appropriate alternatives.

2-1 Carbon Dioxide Line:

Provide a map or a figure to show the current CO_2 line location through the proposed NEF.

- Sections 2.1.2.1, 2.1.2.5, 4.1.1, and 4.1.2. state that the Trinity Pipeline, LLC, 10-in diameter, 2000 psi, underground CO_2 pipeline traverses southwest to northwest across the proposed NEF and would be re-routed but no maps show the current location of the pipeline.

LES Response

Text removed under 10 CFR 2.390.

2-2 Septic Tanks and Leach Fields:

Provide a detailed description of the septic tanks and leach fields.

- Section 2.1.2.5 states "three septic tanks with a common leach field will be installed onsite." Sections 3.12.1.3.4 and 4.4.7 discuss the effluent discharge systems.

LES Response

The design approach for disposal of sanitary wastes has been modified since the submittal of the ER. LES will incorporate a detailed description of the NEF septic systems in the next revision to the ER. Six septic systems are now planned in lieu of three septic tanks with a common leachfield. Each septic system will consist of a septic tank with one or more leachfields. Refer to Figure ER RAI 2-2, "Planned Septic Tank System Locations," in Attachment 3 to this submittal for the planned location of the six septic tank systems.

The six septic systems are capable of handling approximately 40,125 liters per day (10,600 gallons per day) based on a design number of employees of approximately 420. Based on the actual number of employees, 210, the overall system will receive approximately 20,063 liters per day (5,300 gallons per day). Total annual design discharge will be approximately 14.6 million liters per year (3.87 million gallons per year). Actual flows will be approximately 50 percent of the design values.

The septic tanks will meet manufacturer specifications. Utilizing the percolation rate of approximately 3 minutes per centimeter (8 minutes per inch) established by actual test on the site, and allowing for 76-114 liters (20-30 gallons) per person per day, each person will require 2.7 linear meters (9 linear feet) of trench utilizing a 91.4-centimeter (36-inch) wide trench filled with 61 centimeters (24 inches) of open graded crushed stone. As indicated above, although the site population during operation is expected to be 210 persons, the building facilities are designed by architectural code analysis to accommodate up to 420 persons. Therefore, a total of approximately 975 linear meters (3,200 linear feet) of percolation drain field will be required. The combined area of the leachfields will be approximately 892 square meters (9,600 square feet).

2-3 Treated Effluent Evaporative Basin (TEEB):

A. Provide specific information on the materials and construction methods to be used for the double-lined TEEB.

- Section 4.4.7 describes controls of impacts to water quality including the TEEB which is double-lined with leak detection equipment installed and open to allow evaporation.

B. Describe the methodology used to determine that the basin liner(s) would last the entire life of the proposed NEF.

C. Describe the proposed monitoring system used to determine whether the liner(s) has been breached. Provide specific information on the equipment and its alarm activation and operation system.

D. Describe the proposed mitigating actions to be implemented if the liner(s) fails.

E. Provide the process for decommissioning the TEEB and disposing of the soil and sludge as low-level waste.

- Based on Section 2.1.2.3.4, the TEEB soil/sludge would contain a complexing agent (citrate), Uranium, and other decay product radionuclides from the 30 years of operation.

F. Identify the treatment method(s) used to treat the citrate in the liquid effluent prior to discharging it into the TEEB.

G. Verify that the amount of chelating agent (i.e., citric acid) in the TEEB's soil/sludge would be acceptable for low-level waste disposal.

LES Response

A. Materials and construction methods to be used for the double-lined Treated Effluent Evaporative Basin (TEEB) will be in compliance with current New Mexico Environment Department (NMED) Guidelines for Liner Material and Site Preparation for Synthetically-Lined Lagoons, December 1995.

The TEEB will have two, geosynthetic fabric liners. The geosynthetic liner material will be chemically compatible with potential liquid effluents to be discharged to the TEEB, resistant to sunlight deterioration, and of sufficient thickness to have adequate tensile strength and tear and puncture resistance. The liner material will be selected during final design and may consist of high-density polyethylene (HDPE) or ethylene interpolymer alloy (Coolgard® XR-5® or Ultra Tech®).

Methods that will be used to construct the TEEB, from the bottom up, are as follows.

- A minimum 0.61-meter (2-foot) thick layer of on-site clay-type soils, free from rock, and compacted at optimum moisture content to 95% of Standard Effort, i.e., American Standard for Testing and Materials (ASTM) D698, "Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort

(12,400ft-lbf/ft^3 (600kN-m/m^3))," (applicable version at time of design) will be prepared. The plastic limit of the clay will be approximately 20 and the material will be compacted to +3% of its optimum moisture content.

- A geosynthetic fabric liner will be installed on top of the prepared soil layer. This will serve as the secondary (lower) liner.
- Leak collection piping and associated sump and pumping system, to pump any leakage back to the TEEB, will then be placed.
- A geomembrane drainage mat with the imbedded leak collection piping will be added.
- The primary (upper) geosynthetic fabric liner will be installed.
- The primary liner will then be covered by a minimum 0.3-meter (1-foot) thick prepared layer of on-site clay, free of rock, and compacted at optimum moisture content.
- Liner installation will be by manufacturer certified installers and will be installed and tested according to project specifications.

In addition, the TEEB will be enclosed with animal-friendly fencing to prevent wildlife and unauthorized personnel access. It will also be covered by surface netting or other suitable devices, to exclude waterfowl access to basin water.

B. The methodology that will be used to determine that the basin liner(s) will last the entire life of the proposed NEF is as follows:

- A geosynthetic fabric liner determined to be chemically compatible with basin contents will be selected. The selection process will include consultation with liner manufacturers. This will occur during final design.
- The selected liner will have a projected service life in excess of the projected life of NEF.
- Liner thickness will comply with current NMED Guidelines for Liner Material and Site Preparation for Synthetically-Lined Lagoons, December 1995 and with the recommendations of the liner manufacturer.
- Liner material will be ultraviolet resistant and covered by a minimum of 0.3-meter (1-foot) thick prepared layer of on-site clay, free of rock, and compacted at optimum moisture content.
- The liner material will be pre-approved by a professional engineer and the NMED, as required by current NMED Guidelines for Liner Material and Site Preparation for Synthetically-Lined Lagoons, December 1995.
- Site preparation for basin construction will meet or exceed current NMED Guidelines for Liner Material and Site Preparation for Synthetically-Lined Lagoons, December 1995.

- Liner installation will be by manufacturer certified installers and will be installed and tested according to project specifications.

- Lastly, a monitoring plan will be implemented. The monitoring plan will consist of periodic inspections and implementation of corrective measures, if required.

By following the above methodology, the basin liner(s) are expected to last the entire life of the proposed NEF.

C. The proposed monitoring system for determining whether the primary (upper) liner has been breached will be an active liquid-sensor leak detection system. This system is a drain/sump system consisting of collection pipes that will be routed to a monitored sump. If the sump is collecting liquid, a level monitor will alert site staff. Specific information on the equipment, its periodic testing, and its alarm activation and operation system will be determined during final design.

D. Proposed mitigating actions to be implemented upon failure of the primary (upper) liner, detected by the leak detection system are as follows. Damage to the liner will be promptly assessed and corrective action taken to restore the system integrity. The TEEB will be designed with two cells. As such, the cell with the failed liner can be isolated, drained and repaired. During this time period, discharges will be to the cell with the intact liner. Furthermore, the secondary (lower) liner will preclude discharge to the subsurface in the case of a breach in the primary liner. Notifications and corrective measures required by the NMED Ground Water Quality Bureau will be promptly initiated. Given the methods used to construct the TEEB (See the response to RAI 2-3A) which will provide physical separation between the two liners as well as a minimum cover over the upper liner of 0.3 m (1.0 ft) and the liner selection and installation details as specified in the response to RAI 2-3B, catastrophic failure of both TEEB liners is not considered credible.

E. The TEEB is expected to contain low concentrations of uranic materials and decay products in the uppermost soils as residue from the Liquid Effluent Collection and Treatment System. As part of the site closure during the decommissioning process, representative soil samples from across the entire TEEB will be collected and analyzed for radioactive and hazardous constituents. This information will provide the necessary characterization data to develop the waste disposal plan for the transfer of contaminated waste materials to a licensed disposal site. Though the existing low level waste disposal sites (i.e., Barnwell in South Carolina and Envirocare in Utah) do permit limited quantities of waste with chelating agents, the Liquid Effluent Collection and Treatment System by process design is not expected to generate detectable quantities of citric acid (citrate) in the TEEB soil. The sediment and soil over the top of the upper liner and the liner itself will be disposed of, if required, as low level waste. Similarly, the leak detection system components and the lower liner will also be removed and disposed of accordingly. Lastly, the soil under the lower liner will be sampled and disposed of as low-level waste, if required. Excavations and berms will be leveled to restore the land to a natural contour.

F. The decontamination system uses citric acid, a chelating agent, to remove contamination from equipment and components. The concentration of the citric acid is between 5% and 7%. Disposal of spent citric acid results in an input waste stream to the Liquid Effluent Collection and Treatment System that will periodically contain a citric acid solution with dissolved uranic materials. The preliminary design of the Liquid Effluent Collection and Treatment System treats critic acid in the first portion of a multistage process for waste

stream conditioning and removal of contaminants. The first stage of this treatment process utilizes a neutralization and precipitation reaction by the addition of a hydroxide (potassium or sodium) as a precipitating agent in the Precipitation Treatment Tank. This action is intended to raise the pH of the liquid waste to a range of 9 to 12. This treatment renders the soluble Uranium compounds insoluble allowing them to precipitate from solution. It also breaks down the citric acid as a chelating agent. Precipitated solids are removed from the treated solution by circulating the treated liquid through a filter press. The filter press separates suspended solids from the liquid. With proper control of pH, no critic acid will remain after this stage of treatment. The downstream stages of liquid treatment after the Precipitation Treatment Tank include a waste evaporator/dryer which will boil the waste liquid to create a clean distillate stream and concentrated waste bottoms. If any weak solutions of critic acid were to be carried over to the evaporator/dryer due to unexpected operating conditions, it will tend to dissociate to carbon dioxide (CO_2) and water when heated. The distillate fraction from the evaporator is collected in the Treated Effluent Monitoring Tanks before being discharged to the TEEB. Polishing demineralizers are provided in the design as a final stage of treatment if the effluents from the Treated Effluent Monitoring Tanks need additional processing before release to the basin. During final design of the Liquid Effluent Collection and Treatment System, process parameters and design requirements will be established to ensure that no detectable quantities of critic acid will be discharged to the TEEB.

G. The processing of liquid waste though the Liquid Effluent Collection and Treatment System will remove citric acid from the waste stream before discharge of the effluent to the TEEB as discussed in the response to RAI 2-3F above. During final design of the Liquid Effluent Collection and Treatment System, process parameters and design requirements will be established to ensure that no detectable quantities of critic acid will be discharged to the TEEB. Soil analysis of the TEEB soil/sludge as part of the decommissioning process will verify that the material is suitable for low-level waste disposal.

2-4 Uranium Byproduct Cylinder (UBC) Storage Pad:

A. Provide additional information which resolves inconsistencies on the UBC storage pad construction.

- Section 1.2.3 states the UBC storage pad is designed to store up to 15,727 UBCs, or about 25 years worth (i.e., tails generation rate is 625-627 UBCs per year). This statement is inconsistent with Section 1.2 which states the proposed NEF would be licensed for 30 years of operation and Section 4.13.3.1.1 which states "the concrete pad to be initially constructed onsite for the storage of UBCs will only be of a size necessary to hold a few years worth of UBCs."

B. Provide the specific size and capacity for the initial concrete storage pad.

C. Identify the planned expansion dates for the storage pad and discuss the impact the periodic expansions of the storage pad would have on operation and maintenance activities.

D. Discuss the potential for regular periodic expansion of the UBC storage pad that could bring construction crews back onto the proposed NEF which could increase the number of personnel exposed to radiological and hazardous events.

- Section 4.13.3.1.1 states the depleted uranium would be temporarily stored onsite in containers on the UBC storage pad. The current schedule calls for completion of construction activities by 2013, which seems inconsistent with the regular periodic expansion of the UBC storage pad.

LES Response

A. There are no inconsistencies concerning the UBC Storage Pad construction information provided in the license application. The UBC Storage Pad will be sized to store up to 15,727 UBCs. This figure was selected to establish a conservative upper bound estimate with respect to UBC Storage Pad dose calculations, UBC Storage Pad sizing, and the decommissioning funding estimate. The yearly UBC generation rate and cumulative number of UBCs for this scenario are provided in Table ER RAI 2-4A.1, "Production for Nominal 30 Years of Operation," in Attachment 2 to this submittal. As shown in Table ER RAI 2-4A.1, the 15,727 UBC estimate includes a six-year ramp up from 66 to 623 UBCs/yr, followed by 19 years at a constant UBC generation rate of 627 UBCs/yr, and lastly, a seven-year ramp down from 561 to 0 UBCs/yr (i.e., a total of 32 years based on the conservative assumption of facility operation up to the full 30 years).

The NEF is, however, applying for a 30-year license which spans the period from initial receipt of licensed material on site until decommissioning is completed. The actual number of UBCs generated over this 30-year license period will be less than the bounding estimate of 15,727 UBCs. This is shown in Table ER RAI 2-4A.2, "Production During 30-Year License Period," in Attachment 2 to this submittal.

The concrete pad will initially be constructed to store the number of UBCs generated over approximately the first five years of full production. If the need arises to store additional UBCs, prior to a deconversion facility becoming available, the storage pad will

be expanded in about five years from initial construction to provide an additional five-year capacity. Additional expansions, if required, will provide similar storage capacity increases in five-year increments.

B. The concrete pad will initially be constructed to store the number of UBCs generated over approximately the first 5 years of production. The facility is licensed for 30 years and the incremental storage pad expansions would occur, if necessary, about every five years. Therefore, each expansion would be approximately 1/6 of the total pad size. The total design storage pad area is approximately 8.5 hectares (21 acres); therefore, the initial pad size will be approximately 1.4 hectares (3.5 acres). This size will be adequate to store the initial five years of UBCs that are generated by the NEF. It is the intention of LES to pursue a deconversion option which would preclude the need to expand the storage pad beyond its initial constructed size. Once the deconversion option is established, the shipments to the deconversion facility would approximately match the generation rate, thus precluding the need for additional storage area.

C. The expansions, if required, will occur approximately every five years. Storage pad expansion during facility operation will have negligible impacts on operation and maintenance activities. The construction effort would be adjacent to the existing storage pad segment(s) in use at the time. Construction activities would be coordinated so as not to impact pad operations or maintenance activities associated with storage, inspection, and maintenance of UBCs.

D. The current schedule shows that production from the first cascade is estimated to start in 2008 and completion of facility construction in 2013. The first UBC Storage Pad segment would be completed once the first cascade goes into production or shortly thereafter to store the Uranium byproduct produced by the first cascade. As explained above, subsequent UBC Storage Pad segments would be built only if needed as the facility continues to operate without the ability to send the Uranium byproduct to a deconversion facility.

The potential radiological impact to construction crews for expansion of the UBC Storage Pad by segment has been evaluated. The maximum individual dose to a construction worker is estimated to be about 2.66 mSv (266 mrem). For an estimated work force of 91 people and 47,181 total craft hours for the construction of each pad segment, the collective dose is about 0.208 person-Sv (20.8 person-rem). The dose estimates were based on expected dose rates at various distances from the edge of a full UBC Storage Pad.

Work planning will consider additional As Low As Reasonably Achievable (ALARA) aspects such as the use of temporary shadow shields (i.e., "Jersey Barriers") between the end of an existing storage pad segment containing UBCs and the segment under construction, rotation of work crews, increasing the distance between the closest row of cylinders on the UBC Storage Pad and the construction area by initiating work prior to when the existing storage pad segment is full, and the placement of relatively high dose rate empty (heels only) cylinders on the far side away from the work area. Construction work will be coordinated with routine plant operations and maintenance activities on the UBC Storage Pad to preclude any hazardous events impacting the construction crews. The construction crews will be monitored for radiation exposure and receive appropriate training commensurate with the radiological risk during UBC Storage Pad construction activities.

2-5 Depleted Uranium:

A. Provide LES's determination on whether the depleted uranium is a waste or a resource material.

- Section 4.13.3.1.3 notes that "NRC expects LES to indicate in its proposed NEF license application whether the depleted uranium tails will be treated as a waste or a resource" and that "LES will make a determination as to whether the depleted uranium is a resource or a waste and notify the NRC."

B. Provide an update on actions to identify and finalize a viable disposal path for the depleted uranium.

- Section 4.13.3.1.1 states that LES is committed to aggressively pursue economically viable disposal paths for the disposition of UBCs.

LES Response

A. LES will provide information on the determination on whether the depleted Uranium is a waste or a resource material to the NRC in the near future.

B. Discussions are continuing with Cogema that may potentially lead to a Memorandum of Agreement regarding a contract between Cogema and LES for the deconversion of byproduct produced at the NEF. In addition, LES has been approached by ConverDyn, the company that operates the only Uranium conversion plant in the U.S, and another company in the Uranium business about building a private deconversion facility. In fact, ConverDyn is interested in using the hydrogen fluoride (HF) byproduct from the deconversion plant in its operating Uranium conversion plant. These discussions are continuing.

2-6 Construction and Operation Resources:

Provide a list of resources and materials that would be used, consumed, or stored at the proposed NEF during construction and operation.

- Section 2.1.2.3 describes the proposed NEF process, building and related operation. However, there is no information on the resources and materials that would be used, consumed, or stored at the proposed NEF during construction and operation. Materials may include steel, aluminum, asphalt, water, electricity, concrete, wood, fuel (diesel and gas), chemicals, etc.

LES Response

Items used, consumed, or stored at the site during construction are typical construction commodities. The construction commodities would typically be used immediately after being brought to the site. Some materials would be stored for a short duration until they were used or installed. Table ER RAI 2-6.1, "Commodities Used, Consumed, or Stored at the NEF During Construction," in Attachment 2 to this submittal summarizes the resources and materials used during the 3 year period of site preparation and major building construction.

ER Tables 3.12-1, "Estimated Annual Radiological and Mixed Wastes," 3.12-2, "Estimated Annual Non-Radiological Wastes," and 3.12-3, "Estimated Annual Gaseous Effluent," provide listings of materials and resources that are expected to be used, consumed, or stored on site during plant operation. The resources and materials provided in Table ER RAI 2-6.2, "Commodities Used, Consumed, or Stored at the NEF During Operation," in Attachment 2 to this submittal are also expected to be used, consumed, or stored on an annual basis at the NEF and will be added in the next revision to the ER.

2-7 Alternatives Sites:

A. *Provide a sample calculation to allow the NRC to reproduce the site score results* in Section 2.1.3.3.3.

- In Section 2.1.3.3.3, a summary is provided on how the site scores are calculated. Table 2.1-9 summarizes the unweighted scores of the sites against the second phase screening criteria. Figures 2.1-7 and 2.1-8 present the final weighted scores.

B. Clarify the Eddy County site's higher score under the air quality licensing criteria over the Lea County site.

- Table 2.1-9 states both the Lea County and the Eddy County sites are in the same air quality attainment area as defined by U.S. Environmental Protection Agency (EPA). The Eddy County site is closer to a larger population center (Carlsbad) than the Lea County site. The Eddy County site may be penalized for uncertainty in being available for siting the proposed NEF.

C. Verify that the description of the Eddy County site is accurate in Section 2.1.3.3.4.2.

- The written description of the location of the Waste Isolation Pilot Plant (WIPP) access road and utilities indicate that the correct site is Section 11 of Township 22S, Range 31E of the New Mexico Meridian which is northeast of the current WIPP site. Section 2.1.3.3.4.2 identifies the Eddy County site as Section 8 of Township 22S, Range 31E of the New Mexico Meridian which is near the northwest corner of the WIPP site.

D. Include in Figures 2.1-7 and 2.1-8 the score for the Portsmouth, Ohio site.

- Figures 2.1-7 and 2.1-8 present the final weighted scores of five of the six sites, omitting the score for the Portsmouth, Ohio site.

LES Response

A. LES has provided a compact disc as an enclosure to this submittal containing a spreadsheet file (ER RAI 2-7.A Site Scoring Calculation 5-11-04.xls) that shows the calculation and values for the sub-criteria and the individual weighted scores by site for each sub-criterion.

The calculation for determining the weighted scores is as follows:

- Normalized weights for each major objective are established by dividing the assigned weight of the objective by the summed weight of all the major objectives. Example: the sum of all major objectives is 310. The normalized weight for Operational Requirements is 100 (the assigned weight) divided by 310, or 0.323.

- Normalized weight of each criterion is established by dividing the assigned weight for the criterion by the sum of the weights of all the criteria assigned to a major objective. Example: The sum of all criteria weights for the major objective identified as

Operational Readiness is 265. The normalized weight for Size of Plot is 80 (the assigned weight of the criterion) divided by 265, or 0.302.

- Similarly, the normalized weight for each sub-criterion is established by dividing the assigned weight of the sub-criterion by the sum of the weights for all the sub-criteria assigned to a criteria. Example: The sum of all sub-criteria weights for the Size of Plot is 340. The normalized weight for Future Expansion is 100 (the assigned weight of the sub-criterion) divided by 340, or 0.294.

- Normalized scores are established for each sub-criterion by dividing actual sub-criterion scores by 10. Example: For Carlsbad, the score for Future Expansion is 9. The normalized score is 9 divided by 10, or 0.9.

- Weighted scores for each sub-criterion are established by multiplying the normalized score by the normalized weights of the three applicable rating sets (major objective set, criteria set, and sub-criteria set). Example: The weighted score for Future Expansion at Carlsbad is 0.9 x 0.323 x 0.302 x 0.294 = 0.026. The normalized weight for each sub-criterion is the normalized score for the sub-criterion multiplied by the normalized weight of the criterion multiplied by the normalized weight of the major objective (for Future Expansion this is 0.294 x 0.302 x 0.323 = 0.029).

During preparation of the response to this RAI, an error was identified in the scoring model in which the normalized scores for the sub-criterion "On or Near an Existing Nuclear Facility" were incorrectly divided by 100 instead of 10. This resulted in changes to the weighted scores for this sub-criterion for the Portsmouth site, the Hartsville site, the Bellefonte site, and the Lea County site. Carlsbad and Eddy County site scores were not affected since they scored "0" for this sub-criterion.

The correction in the model results in the following revised final weighted scores for each site:

Eddy County	0.830	(slight change due to rounding)
Lea County	0.823	
Bellefonte	0.782	
Hartsville	0.774	
Portsmouth	0.758	
Carlsbad	0.731	(no change)

Additional errors were identified in Table 2.1-9 in the ER and will be revised to correct the following scores for "Air Permitting" and "Craft Apprenticeship" sub-criteria:

Sub-Criterion – Air Permitting

Bellefonte	10
Carlsbad	10
Hartsville	10
Portsmouth	10

Sub-Criterion – Craft Apprenticeship

Bellefonte	5
Hartsville	5

LES will incorporate the corrections in the next revision to the ER.

B. For the Air Quality Sub-criterion, the scoring scale was based on whether the site is proximal to a "facility" that could affect the proposed site's air quality. Using the established scoring criteria, being closer to a population center would not affect the score. At Lea County, nearby industries/activities with particulate and organic emissions (i.e., Wallach Quarry, oil and gas extraction wells, etc.) could potentially impact air quality at the proposed site; however, impacts were deemed to be unlikely. At Eddy County, the potential impact on air quality from the nearby, underground WIPP site was deemed to be highly unlikely, essentially negligible. Therefore, Eddy County received a higher score than Lea County.

C. The description of the Eddy County site in ER Section 2.1.3.3.4.2 is correct. Figure ER RAI 2-7C.1, "Aerial View of Eddy County Site," in Attachment 3 to this submittal provides an aerial view of the Eddy County site. As described in Section 2.1.3.3.4.2 and as shown on Figure ER RAI 2-7C.1, the main WIPP access road is on the southeastern edge of the site.

D. Figures ER RAI 2-7D.1, "Contributions by Grouped Criteria," and ER RAI 2-7D.2, "Contributions by Criteria," in Attachment 3 to this submittal include the final weighted scores for the six sites, including Portsmouth. LES will revise ER Figures 2.1-7 and 2.1-8 to be consistent with Figures ER RAI 2-7D.1 and ER RAI 2-7D.2 in the next revision to the ER.

SECTION 3 – DESCRIPTION OF AFFECTED ENVIRONMENT

Pursuant to 10 CFR 51.45(b), the ER is required to contain a description of the affected environment.

3-1 Geology and Soils:

A. Provide information on the existing soil contamination due to chemicals at the proposed NEF.

- Section 3.3 discusses geological characteristics of the soil, but specific physical or chemical data is lacking.

B. Clarify whether Red Bed Ridge is associated with the Mescalero Escarpment or if it is the result of other structural/erosional activity in Section 3.3.

C. Clarify whether single values estimating the thickness of the geological units represent averages across the proposed NEF site in Table 3.3-1.

D. Provide the average value when a range of depth or thickness is stated for the various materials in Table 3.3-1.

E. Provide a range of values when a single value of thickness is stated.

LES Response

A. ER Section 3.11.1.1 describes ten surface soil samples that were previously collected for initial radiological characterization of the NEF site. Eight additional surface soil samples were subsequently collected and analyzed for both radiological and non-radiological chemical analyses. Radiological chemical analyses included gamma spectrometry, thorium, and Uranium products. Non-radiological chemical analyses included volatiles, semi-volatiles, 8 Resource Conservation and Recovery Act (RCRA) metals, organochlorine pesticides, organophosphorous compounds, chlorinated herbicides and fluoride. Six of the additional eight soil sample locations were selected to represent background conditions at proposed plant structures. The other two sample locations are representative of up-gradient, on-site locations. The eight soil samples and their approximate locations are provided on Figure ER RAI 3-1A, "Soil Sample Locations," in Attachment 3 to this submittal and in Table ER RAI 3-1A.1, "NEF Site Soil Sample Locations," in Attachment 2 to this submittal.

The radiological analytical results for the eight soil samples are provided in Table ER RAI 3-1A.2, "Radiological Chemical Analyses of NEF Site Soil," in Attachment 2 to this submittal. A comparison of the radiological analytical results and the results reported in ER Section 3.11.1.1 shows that the radiological nuclides detected in the eight additional soil samples included the same radiological nuclides detected in the initial ten soil samples. However, two additional radiological nuclides (Th-230 and U-235) were detected in the more recent soil samples. Th-230 was not analyzed in the initial ten soil samples and a lower laboratory measured minimum detectable concentration (MDC) for U-235 was used in the analyses for the eight additional soil samples than was used for the initial ten soil samples. Th-230 is naturally occurring and associated with the decay

of U-238. Similar to U-234 and U-238, U-235 is a natural Uranium isotope found in the environment.

The non-radiological analytical results provided for the eight soil samples in Table ER RAI 3-1A.3, "Non-Radiological Chemical Analyses of NEF Site Soil," in Attachment 2 to this submittal indicate that barium, chromium and lead were detected above laboratory reporting limits in all eight soil samples. However, their detected levels are below State of New Mexico Soil Screening Levels as developed by the NMED Hazardous Waste Bureau, the Ground Water Quality Bureau and the Voluntary Remediation Program (Technical Background Document for Development of Soil Screening Levels, Revision 2, February 2004, published by NMED). Other non-radiological parameters were not detected at levels above the laboratory reporting limits.

LES will incorporate the radiological and non-radiological analytical results for the eight samples in the next revision to the ER.

B. The Red Bed Ridge and the Mescalero Escarpment are not associated with one another. LES will revise ER Section 3.3 to clarify that the Red Bed Ridge and the Mescalero Escarpment are not associated and to provide additional information concerning the Red Bed Ridge in the next revision to the ER.

The Red Bed Ridge is a prominent buried ridge developed on the upper surface of the Triassic Dockum Group "red beds." The crest of the buried Red Bed Ridge is approximately 1.6 km (1 mi) or so in width and extends for at least 160.9 km (100 mi) in length from northern Lea County, New Mexico, through western Andrews County, Texas, and southward into Winkler and Ector Counties in Texas. The Red Bed Ridge runs from the northwest to the southeast, just north and northeast of the NEF site through the adjacent Wallach Quarry and Waste Control Specialists (WCS) properties. The designation Red Bed Ridge derives from geologic reports related to site investigations for the nearby WCS facility. Its origin appears to be the result of the relative resistant character of the claystone of the Chinle Formation and to caliche deposits that cap the ridge.

The NEF is located about 6.2 to 9.3 km (10 to 15 mi) southeast of the Mescalero Escarpment. Although the Mescalero Escarpment and the Red Bed Ridge are likely to have originated due to similar geomorphological processes, as both appear to be remnant erosional features, they are not associated with each other.

C, D, and E.

LES will revise ER Table 3.3-1 to clarify the information on depth and thickness of the surficial materials. The revised table is provided as Table ER RAI 3-1C.1, "Geological Units Exposed At, Near, or Underlying the Site," in Attachment 2 to this submittal. Ranges and averages are provided when available. The deeper units are based on information from a single source and ranges or averages are provided, as applicable. The revised table also factors in additional data obtained since the table was originally prepared. Revisions to ER Table 3.3-1 will be incorporated in the next revision to the ER.

3-2 Water Resources:

Provide an explanation for the units of the chemicals listed below U-238 in Table 3.4-3. Specifically, explain the use of negative values.

LES Response

The data listed for U-238 and below in Table 3.4-3 is from the analysis of site ground water for radionuclides. The results listed are levels of radioactivity given first in pCi/L followed by Bq/L in parentheses. Revisions to ER Table 3.4-3 to explain the negative values and clarify the units of the analyses will be incorporated in the next revision to the ER.

Some of the radionuclide results given in Table 3.4-3 are negative. It is possible to calculate radioanalytical results that are less than zero, although negative radioactivity is physically impossible. This result typically occurs when activity is not present in a sample or is present near background levels. Laboratories sometimes choose not to report negative results or results that are near zero. The EPA does not recommend such censoring of results.

The laboratory performing the radioanalytical services for the NEF site follows the recommendations given in EPA Report: EPA 520/1-80-012;1980: Upgrading Environmental Radiation Data; Health Physics Society Committee Report HPSR-1, Washington, D.C. This report recommends that all results, whether positive, negative, or zero, should be reported as obtained.

3-3 Air Quality and Meteorology:

Provide the correlation analyses of the meteorological data from the Midland-Odessa, Texas Airport with the Waste Control Specialists (WCS) meteorological data.

LES Response

The meteorological tower in use at WCS is ten meters tall with ambient temperature measurements at ten and two meters (32.8 and 6.6 feet) above ground level. Although there are wind speed and direction measurements, there are no data to determine atmospheric stability. Therefore, the National Oceanic and Atmospheric Administration (NOAA) certified data from Midland-Odessa, Texas, were used. The NOAA data used were for those years (1987-1991) available from the EPA Support Center for Regulatory Air Models (SCRAM) world wide web site. The EPA had filled in all missing data values, as required for use with EPA air dispersion models.

WCS provided unvalidated hourly meteorological data from January 2000, through December 2001. These were the only full years of data available from WCS. The raw WCS meteorological data were reformatted for use by a meteorological computer model. The meteorological computer model generated a joint frequency distribution table of wind direction from the WCS meteorological data. The data from that table as well as the Midland-Odessa wind frequency distribution information are presented in Table ER RAI 3-3.1, "Wind Frequency Distribution," in Attachment 2 to this submittal.

As shown in Table ER RAI 3-3.1, the prevailing wind direction has a southerly component at both sites. Figure ER RAI 3-3, "Comparison of Wind Direction Data," provided in Attachment 3 to this submittal, provides a graphical comparison of the WCS and the Midland-Odessa wind direction frequency distribution. A comparison of the WCS and Midland-Odessa data provided in Table ER RAI 3-3.1 and in Figure ER RAI 3-3 shows good agreement in wind direction frequency between the two sites even though the meteorological data are from different time periods and the two sites are separated in distance and are at different elevations.

Other reasons justifying the use of the Midland-Odessa meteorological measurements include:

- Both locations have similar climates,
- Only two years of data were available for the WCS (five years of data is considered to be a minimum when using EPA air dispersion codes to perform air quality analyses,
- The WCS data collection system provided no information for the determination of atmospheric stability,
- Midland-Odessa is the closest first-order National Weather Service station to the NEF site, and
- The EPA had filled in all missing data values in the Midland-Odessa data set, as required for use with EPA air dispersion models.

Because the data from both sites show a predominance of southerly winds, it is reasonable to use the Midland-Odessa meteorological data. LES will incorporate a correlation analysis of the meteorological data from the Midland-Odessa, Texas Airport with the WCS meteorological data in the next revision to the ER.

3-4 Ecological Resources:

A. Identify on a map the locations of the two Areas of Critical Environmental Concern (ACC) designated for the Lesser prairie chicken.

- Sections 3.5.2 stated that the Bureau of Land Management is in the process of designating two public land parcels within Lea County as ACC for the Lesser prairie chicken.

B. Provide a copy of the reference that was cited (Stinnett, 2002) in the ER.

C. Provide the results of any additional surveys conducted to identify habitat suitability, if any, and any mitigation measures that would be undertaken to reduce the impacts and protect the Sand dune lizard and Lesser prairie chicken.

D. Provide detailed information on the habitat and biology of the Black-tailed prairie dog.

- The U.S. Fish and Wildlife Service identified the Black-tailed prairie dog as a candidate species.

E. Determine if the proposed NEF site contains habitats that would be attractive to the Swift fox, the American peregrine falcon, the Arctic peregrine falcon, the Baird's sparrow, the Bell's vireo, the Western burrowing owl, and the Yellow-billed cuckoo.

F. Discuss the species listed above and their potential vulnerabilities to construction, operation, and decommissioning of the proposed NEF.

LES Response

A. Figure ER RAI 3-4A, "County Map, Proposed Area of Critical Environmental Concern (ACEC), Lesser Prairie Chicken," in Attachment 3 to this submittal depicts the approximate location of the two proposed, Lesser Prairie Chicken ACECs. The nearest Lesser Prairie Chicken ACEC straddles Lea and Eddy Counties and as stated in ER Section 3.5.3, is about 48 km (30 mi) northwest of the proposed NEF site. The second Lesser Prairie Chicken ACEC, which is further north, borders the northwest corner of Lea County. LES will incorporate this figure in the next revision to the ER.

B. A copy of the cited reference entitled "Lesser Prairie-Chicken (Tympanuchus pallidicinctus), Area of Critical Environmental Concern (ACEC), A Petition to the New Mexico BLM", by Ken Stinnett, is enclosed in Attachment 6 to this submittal.

C. A copy of a recently conducted Lesser Prairie Chicken (LPCH) confirmatory survey of the NEF site is enclosed in Attachment 6 to this submittal. No LPCHs were detected during the survey by visual sightings or aural detections. No LPCHs were detected and there is little potential habitat in the survey area. In addition, high human disturbance and predator potential in the area make it unlikely that LPCHs will colonize the area. Based on these findings, no mitigation measures are planned by LES to reduce the impacts on or to protect the LPCH at the NEF site.

A report on the Sand Dune Lizard survey conducted by LES in 2003 was previously provided to the NRC (ADAMS Accession Number ML040850611). The report was also submitted to the State of New Mexico Department of Game and Fish and to the US Fish and Wildlife Service. The conclusion of the study was that the habitat of the NEF site is unsuitable for Sand Dune Lizards. The primary reasons are as follows:

- The high frequency of mesquite and grassland associations on the site are associated with environmental conditions that do not support Sand Dune Lizards.
- A low frequency and extent of shinoak dunes and large blowouts on the site, which provide the habitat and microhabitats necessary for Sand Dune Lizard survival.
- The shinnery dune habitats that do exist on the site are isolated from occupied shinnery dunes.
- The ecotonal characteristics of the site are in contrast to the primary habitat of Sand Dune Lizards. The primary habitat of Sand Dune Lizards is sand dunes dominated by shinoak, with scattered sand sage, yucca, and grasses, and notable for an absence of mesquite.

No Sand Dune Lizards were detected during the 2003 survey and there is little potential habitat in the survey area. Based on these findings, no mitigation measures are planned at this time to reduce the impacts on or protect the Sand Dune Lizard at the NEF site.

The Sand Dune Lizard report is under review by the State of New Mexico Department of Game and Fish. LES is presently discussing the scope for a follow-up confirmatory survey with the State of New Mexico Department of Game and Fish. The confirmatory survey will be completed during the summer of 2004. LES will provide the results of any future surveys of Sand Dune Lizards to the NRC.

LES will incorporate additional information concerning LPCHs and Sand Dune Lizards in the next revision to the ER.

D. LES will include the following information on the habitat and biology of the Black-tailed Prairie Dog in the next revision to the ER.

Habitat Requirements

Throughout much of its range, Black-tailed Prairie Dog habitat consists of short grass plains, mid-grass prairies, and grass-shrub habitats. Historically, they were widespread and abundant east of the Rio Grande River and in the grasslands of southwestern New Mexico. Though they have expanded their range into oak shinnery and other grass-shrub habitats, they typically avoid areas with tall grass, heavy sagebrush, and other thick vegetation cover. Colonies of Black-tailed Prairie Dogs have been reported in the Plains-Mesa Grasslands vegetation type of southeastern New Mexico. They are not dependent on free water, getting adequate water from plants and precipitation events in arid and semi-arid habitats.

Black-tailed Prairie Dogs depend on grass as their dominant food source, and usually establish colonies in short grass vegetation types that allow them to see and escape predators. The predominant vegetation type, plains-mesa sand scrub, on the NEF site is

not optimal Black-tailed Prairie Dog habitat because of the high density of shrubs. Shrubs comprise 36 % of the relative vegetative cover and are present on the site at density levels of 16,549 individuals per hectare (6700 individuals per acre). Tall grass and shrubs provide hiding cover for predators such as coyotes and badgers. Shrubs provide perching locations for raptors that also prey on prairie dogs.

There have been no sightings of Black-tailed Prairie Dogs, active or inactive prairie dog mounds/burrows, or any other evidence, such as trimming of the various shrub species, of prairie dogs at the NEF site.

Life History

Black-tailed Prairie Dogs are large rodents weighing 0.5 to 1.4 kg (1 to 3 lb) and are 25 to 41 cm (10 to 16 in) long. They live in well-organized colonies or "towns" with family subgroups. Prairie dogs dig extensive, deep and permanent burrows with a dome-shaped mound at the entrance. Nest cavities are in the deeper parts of burrows for protection of the young and to mitigate temperature fluctuations. Black-tailed Prairie Dogs are diurnal, being active primarily during daylight hours. In southeastern New Mexico, they may remain active throughout the year, although they may remain below ground during adverse winter weather.

Historically, Black-tailed Prairie Dog towns on the mixed grass plains ranged in size from a few individuals to several thousand. Currently, large concentrations are rare due to extensive poisoning and loss of habitat during the last century. Typically, in southeastern New Mexico, prairie dog towns range in size from 8 to 40 hectares (20 to 100 acres), though some towns are smaller than 8 hectares (20 acres) and are larger than 40 hectares (100 acres).

Population Dynamics

Black-tailed Prairie Dogs breed from January to March, with a 29-60 day gestation period. Young are live-born with litter size ranging from 3 to 5. Normally, there is one litter per year. At about six weeks of age, the young appear above ground and are able to walk, run, and eat green food. The family units remain intact for almost another month, but the ties are gradually broken and the family disperses. Sexual maturity is reached in the second year.

Formerly, the chief predators of Black-tailed Prairie Dogs were Black-footed Ferrets, badgers, and raptors. Because of their competition with domestic livestock for grass, prairie dogs were extensively poisoned, trapped, and hunted during the late 19th century and throughout the 20th century. Consequently, the prairie dog numbers have been reduced by 98-99% of their former numbers across the West. The Black-tailed Prairie Dog was listed as a candidate species under the Endangered Species Act by the US Fish & Wildlife Service in 2000.

E. The following discusses the potential habitat for Swift Fox, the American Peregrine Falcon, the Arctic Peregrine Falcon, the Baird's Sparrow, the Bell's Vireo, the Western Burrowing Owl, and the Yellow-billed Cuckoo. This information will be incorporated in the next revision to the ER.

Swift Fox

The proposed NEF site contains habitat that has the potential to attract Swift Fox. The Swift Fox is known to inhabit Plains-Mesa Sand Scrub and Plains-Mesa Grasslands vegetation types that occur at or in the immediate vicinity of the NEF site. However, this small fox is more closely associated with grasslands. The Swift Fox preys primarily on rodents such as kangaroo rats and rabbits, and is closely associated with prairie dogs and other burrowing animals. Breeding habitat requires burrows in relative soft soils that the fox digs or alternatively, it may occupy existing burrows of other animals such as prairie dogs or badgers. Given the existing facilities in the immediate area of the NEF site and the low population density of the Swift Fox, 0.19 fox/km^2 (0.49 fox/mi^2) the NEF site is marginally attractive to the Swift Fox. Potential vulnerabilities due to construction, operation, and decommissioning of the proposed NEF are discussed in the response to RAI 3-4F, below.

American Peregrine Falcon

The proposed NEF site has no potential to attract breeding American Peregrine Falcons. In the Rocky Mountain States, Peregrine Falcons require cliffs for breeding, and there are no cliffs in the area. The species uses a variety of open habitats, potentially like those on the NEF site, for foraging, but the closest breeding sites make it unlikely that birds would travel to the area for foraging. Transient birds may use the area during migration but the species is unlikely to winter in the area.

Arctic Peregrine Falcon

The proposed NEF site has no potential to attract breeding Arctic Peregrine Falcons. Arctic Peregrine Falcons are not known to breed in New Mexico. Transient birds may use the area during migration but they are unlikely to winter in the area.

Baird's Sparrow

The proposed NEF site is outside of the breeding range of the Baird's Sparrow and does not include typical breeding habitat. Baird's Sparrows may utilize the area during migration, but the species is not likely to winter in the area. In winter, Baird's Sparrows prefer dense grassy habitats and are generally found to the south of the NEF site.

Bell's Vireo

The proposed NEF site is unlikely to attract Bell's Vireos. In New Mexico, the species generally uses dense riparian woodland habitats for breeding. Although dense mesquite thickets may be used by the species, they generally will use areas only near water. The dense mesquite stands on the NEF site are therefore unlikely to attract Bell's Vireos. Transient birds may use the area during migration but they are very unlikely to winter in the area.

Western Burrowing Owl

The proposed NEF site has the potential to attract Burrowing Owls. The site is within the range of Burrowing Owls and harbors habitats (open grass and shrub habitats with sparse cover) used by Burrowing Owls. The species requires burrows (natural or

human-constructed) for nesting. If there are burrowing mammals such as prairie dogs or badgers in the area, then it is likely that the area may be attractive to Burrowing Owls. Potential vulnerabilities due to construction, operation, and decommissioning of the proposed NEF are discussed in the response to RAI 3-4F, below.

Yellow-billed Cuckoo

The proposed NEF site has no potential to attract breeding Yellow-billed Cuckoos. Cuckoos require riparian woodlands and, in the southwest, are generally not found using other habitats. There are no areas on the NEF site that would qualify as riparian woodland suitable for breeding Yellow-billed Cuckoos. It is possible that a cuckoo might use the site during migration, but wintering here would be very unlikely.

F. The following discusses the potential vulnerabilities for the Swift Fox and the Western Burrowing Owl. These are the only two species from the requested wildlife species list that might be attracted to the habit at the proposed NEF site. This information will be incorporated in the next revision to the ER.

Swift Fox

This species is vulnerable to construction activities that would result in a direct loss of breeding habitat (burrows/dens) and to a decrease in the rodent population that is the primary food source for the Swift Fox. Because the species has adapted to areas of human activities such as overgrazed pastures, plowed fields, and fence rows, it could potentially be present during the NEF operations phase. Decommissioning activities would have similar impacts on the Swift Fox as the construction phase with the potential for den/burrows being destroyed and the disruption of the rodent/rabbit food source.

Western Burrowing Owl

This species is generally vulnerable to construction activities because of the possibility that burrows, and possibly birds or eggs in the burrows, may be destroyed by machinery or structures. The species is generally tolerant of human activity, provided they are not harassed. Relocation of active Burrowing Owl colonies may allow continued existence of the birds in the area if usable burrows and appropriate open habitats are provided. However, the lack of existing burrows at the NEF site reduces the potential impact on this species.

3-5 Socioeconomic:

Provide the tax revenue for Eunice, New Mexico and Lea County.

- Section 3.10 describes the tax methodology but does not provide the tax revenue.

LES Response

The estimated tax revenue and available estimated allocations resulting from the construction and operation of the NEF are provided in Table ER RAI 3-5.1, "Estimated Tax Revenue," and Table ER RAI 3-5.2, "Estimated Tax Revenue Allocations," respectively.

3-6 Background Radiation:

Provide a summary table or chart which shows the normal background radiation levels for the area surrounding the proposed NEF site.

- Section 3.11 discusses the normal background radiation levels for the United States but lacks normal background radiation levels for the area surrounding the proposed NEF site.

LES Response

The ER will be revised to incorporate additional information concerning background radiation levels. Section 3.11.1 of the ER provides some information on background radiation levels specific to the NEF region. For example, the southeastern corner of the State (Carlsbad area), which includes the NEF site area in Lea County, measures an annual average terrestrial absorbed dose of about 0.30 mGy (30 mrad). In addition, initial radiological characterization of the plant site was performed in 2003 by gamma isotopic and Uranium specific analyses of 10 surface soil samples. The results of these analyses are discussed in Section 3.11.1.1. Subsequently, eight additional soil samples were taken from the proposed site and analyzed. The response to ER RAI 3-1A (Geology and Soils) provides the results of the radiological analyses of these soil samples.

Additionally, an inspector with the Radiation Control Bureau of the New Mexico Environment Department, indicated that based on field measurements, the direct radiation background in the area of the proposed NEF is approximately 8 to10 μR/hr. The inspector indicated that this value is somewhat lower than that for other parts of New Mexico.

Section 6.1.2 of the ER describes the Radiological Environmental Monitoring Program (REMP) for the NEF. The REMP includes the collection of data during pre-operational years in order to establish baseline radiological information that will be used in determining and evaluating impacts from operations at the plant on the local environment. The REMP will be initiated at least 2 years prior to plant operations in order to develop a sufficient database.

The data summarized above, supplemented with the REMP data, will fully characterize the background radiation levels at the NEF site.

SECTION 4 – ENVIRONMENTAL IMPACTS

Pursuant to 10 CFR 51.45(c), the ER is required to include an analysis that considers and balances the environmental effects of the proposed action, the environmental impacts of alternatives of the proposed action and alternatives available for reducing or avoiding adverse environmental effects.

4-1 Visual/Scenic Resources Impacts:

Provide a copy of the artistic rendering showing a view of the proposed NEF and how it would visually impact the site and surrounding area.

LES Response

Figure ER RAI 4-1.1, "Aerial View," is an artistic aerial view of the NEF and surrounding area. Figure ER RAI 4-1.2, "View to the Northwest," Figure ER RAI 4-1.3, "View to the East," Figure ER RAI 4-1.4, "View to the South," and Figure ER RAI 4-1.5, "View to the West," in Attachment 3 to this submittal, provide artistic views of the NEF site and vicinity, looking to the northwest, east, south and west, respectively. The quarry and "produced water" lagoons to the north, the existing Waste Control Specialists (WCS) waste facility to the east, the county landfill to the southeast and New Mexico Route 234 to the south are shown in relation to the NEF site. Land to the west, occupied by a petroleum contaminated soil treatment facility, is undeveloped. Viewing the surrounding area from the NEF site, and looking northward, the quarry and "produced water" lagoons are at a higher elevation. To the east, several low-rise buildings associated with the WCS waste facility are apparent at a distance. Earthen mounds are apparent to the southeast, across New Mexico Route 234. No structures are visible on the adjacent property to the west.

As stated in ER Section 4.9.3.1, considering that proposed plant structures will be similar to existing architectural features on surrounding land, the visual impact of the NEF will be minimal.

4-2 Water Resources Impacts:

A. Provide a complete water balance table identifying the estimated flow rates (maximum and minimum) discharged to each of the wastewater basins identified in Section 4.4.7 and the anticipated evaporation, soil adsorption, or evapotranspiration on a monthly basis.

B. Provide the basis for assuming that the sand and gravel layer at the surface is laterally and wholly indurated across the entire proposed NEF site.

- In Section 3.3, it appears there is an assumption being made that the sand and gravel layer at the surface is laterally and wholly indurated across the entire proposed NEF site. The limited information from the geotechnical borings does not support this assumption.

C. Discuss the contaminant pathways in a lateral direction to a groundwater source within the subsurface (i.e., contaminant migration beyond the bounds of the proposed NEF within the sand and gravel layer above the Chinle formation).

- Section 4.4.2 includes discussions on contaminant pathways only in a vertical direction to a groundwater source and not in a lateral direction within the subsurface.

D. Discuss the potential for water or other liquids from spills or pipeline leaks to migrate and flow along the base of the Chinle Formation.

- In the construction of the proposed NEF, the site would be subject to borrow and fill from onsite. The sand and gravel "fill" could be a pathway for water or other liquids from spills or pipeline leaks. The water or liquids may flow along the base of the fill area in an apparent southwesterly direction based on the slope of the Chinle Formation.

E. Provide any impacts to the surrounding land if the site stormwater retention basin overflows.

LES Response

A. Complete water balances for each of the basins identified in ER Section 4.4.7 are provided in Table ER RAI 4-2A.1a, "Water Balance for Treated Effluent Evaporative Basin (Minimum Scenario)," Table ER RAI 4-2A.1b, "Water Balance for Treated Effluent Evaporative Basin (Maximum Scenario)," Table ER RAI 4-2A.2a, "Water Balance for UBC Storage Pad Stormwater Retention Basin (Minimum Scenario)," Table ER RAI 4-2A.2b, "Water Balance for UBC Storage Pad Stormwater Retention Basin (Maximum Scenario)," Table ER RAI 4-2A.3a, "Water Balance for Site Stormwater Detention Basin (Minimum Scenario)," and Table ER RAI 4-2A.3b, "Water Balance for Site Stormwater Detention Basin (Maximum Scenario)," in Attachment 2 to this submittal.

The water balances consider the following components:

- Direct precipitation falling within the basin berms for all 3 basins.

- Stormwater runoff for the UBC Storage Pad Stormwater Retention Basin and the Site Stormwater Detention Basin.

- Other inflows (i.e., discharge from Liquid Effluent Collection and Treatment System for the Treated Effluent Evaporative Basin and cooling tower and heating boiler blowdown for the UBC Storage Pad Stormwater Retention Basin).

- Evaporation for all 3 basins.

- Infiltration for the Site Stormwater Detention Basin. The Treated Effluent Evaporative Basin and the UBC Storage Pad Stormwater Retention Basin are lined. Therefore, infiltration is not considered for these basins.

The water balances include the following inputs and assumptions:

- The minimum and maximum monthly precipitation values are based on data from Hobbs, New Mexico. The annual minimum and maximum precipitation amounts were distributed by month using the average annual distribution by month. Use of the minimum precipitation amounts provides a minimum discharge scenario. Use of the maximum precipitation amounts provides a maximum discharge scenario. These data were used in lieu of ER Table 3.6-1B which provides the extreme maximums and minimums for each month at Hobbs over a 30-year period of record. The information in ER Table 3.6-1B is not representative of what would occur over a very dry or very wet calendar year.

- The discharge from the Liquid Effluent Collection and Treatment System for the Treated Effluent Evaporative Basin was based on the expected average monthly flow.

- The cooling tower blowdown was based on the expected average annual discharge. Monthly distribution will not be available until final design.

- The heating boiler blowbown was based on the expected average annual discharge. This component is relatively small and is not expected to vary significantly month by month.

- Annual evaporation at the site is 203.2 cm (80 in) per year. Monthly distribution was based on information from Roswell, New Mexico.

- Monthly infiltration capacity in the Site Stormwater Detention Basin was conservatively assumed as 61 cm (24 in).

- No credit is taken for outflows from the Site Stormwater Detention Basin through the discharge outlet. Any such flows will eventually infiltrate, evaporate or evapotranspirate.

The tables provide the monthly balance (inflow minus outflow). A positive value indicates that the inflow components exceed the outflow components for the respective basin. A negative value indicates that outflow components will dispose of the entire monthly inflow for the respective basin. The tables also provide the monthly net in the basin. A non-zero value indicates that the basin will contain standing water.

The results for the Treated Effluent Evaporative Basin show that basin outflow due to evaporation will exceed all inflows on a monthly basis for the minimum discharge scenario with the exception of the winter months. Under the maximum discharge scenario, the basin would have standing water in it for most of the year.

The results for the UBC Storage Pad Stormwater Retention Basin show that basin outflow due to evaporation will exceed all inflows on a monthly basis under both discharge scenarios, except for one winter month under the maximum discharge scenario.

The results for the Site Stormwater Detention Basin show that basin outflow due to evaporation and infiltration will exceed all inflows on a monthly basis under both discharge scenarios. Prior to final design of the basin, it is not possible to accurately estimate the distribution of infiltration and evaporation. At this stage in the design, it is reasonable to assume that the basin outflow will be 50 % by infiltration and 50 % by evaporation. Of the amount that infiltrates into the ground, most is expected to eventually return to the atmosphere via evapotranspiration by vegetation growing within and in the vicinity of the basin. As shown in Table ER RAI 4-2A.3, the combination of both potential infiltration and potential evaporation are more than sufficient to dispose of basin inflows on a monthly basis.

B. The five borings are not sufficient to adequately define subsurface conditions for final design purposes, but they are acceptable for judging the feasibility of developing the site. Assuming that the borings are generally representative of subsurface conditions, the site is considered acceptable for the facility structures supported on a system of shallow foundations.

During final design, additional geotechnical investigations will be undertaken to collect more information on the sand and gravel layer.

C. As discussed in ER Section 3.4.15, the nine groundwater exploration borings were performed in the sand and gravel layer above the Chinle Formation and no groundwater was detected. During drilling, only one of the borings produced cuttings that were slightly moist at 1.8 to 4.2 m (6 to 14 ft) below ground surface; other cuttings were very dry. Based on this, it is concluded that a continuous groundwater aquifer does not exist in this layer under the NEF site. Since there is no consistent groundwater in this layer, it does not provide a likely contaminant pathway in the lateral direction.

Due to the lack of groundwater in this layer, potential contamination would travel laterally at very small rates, if at all. The travel time to downstream users through a lateral contaminant pathway would be significant. The lack of ground water in this layer is supported by information from the adjacent Waste Control Specialists (WCS) ground water investigations.

D. During a May 14, 2004, conference call between LES and NRC representatives, the NRC provided a clarification for RAI 4-2D. RAI 4-2D should read: "Discuss the potential for water or other liquids from spills or pipeline leaks to migrate and flow along the top of the Chinle Formation."

Engineered fill will be used during site preparation. The engineered fill will likely be placed against the existing dense sand and gravel layer in some locations, as required.

As discussed in ER Section 3.4.15, the nine groundwater exploration borings were performed in the sand and gravel layer above the Chinle Formation and no groundwater was detected. During drilling, only one of the borings produced cuttings that were slightly moist at 1.8 to 4.2 m (6 to 14 ft) below ground surface; other cuttings were very dry. Based on this, it is concluded that a continuous groundwater aquifer does not exist in the sand and gravel layer under the NEF site. Since there is no consistent groundwater in this layer, it does not provide a likely contaminant pathway in the vertical direction. Addition of on-site fill is not expected to alter this situation.

Due to the lack of groundwater in the sand and gravel layer, potential contamination would travel laterally at very small rates, if at all. The travel time to downstream users through a lateral contaminant pathway, would be significant.

The potential for water or other liquids from spills or pipeline leaks to introduce sufficient amounts of liquid to saturate the sand and gravel layer to a point where significant contaminant migration reaches and flows along the top of the Chinle Formation, is considered unlikely.

E. The Site Stormwater Detention Basin will be designed to accommodate the 24-hour, 100-year return frequency storm. That storm delivers 15.2 cm (6 in) of rain in 24 hours. In addition, the basin has 0.6 m (2 ft) of freeboard beyond the design capacity. The basin will also be designed to discharge post-construction peak flow runoff rates from the outfall that are equal to or less than the pre-construction runoff rates from the site area. The water quality of the discharge will be typical of runoff from building roofs and paved areas from any industrial facility. Except for small amounts of oil and grease typically found in runoff from paved roadways and parking areas, the discharge is not expected to contain contaminants.

During a rainfall event larger than the design basis, the potential exists to overflow the basin if the outfall capacity is insufficient to pass beyond design basis inflows to the basin. Overflow of the basin is an unlikely event. The additional impact to the surrounding land over that which would occur during such a flood alone, is assumed to be small. Therefore, potential overflow of the Site Stormwater Detention Basin during an event beyond its design basis is expected to have a minimal impact to surrounding land.

4-3 Socioeconomic Impacts:

A. Clarify the radius of influence (ROI) for the proposed NEF.

- Section 3.10 describes the radius of influence (ROI) as 120 km (75 mi), while it is described as 112 km (70 mi) in Section 4.10.

B. Explain how the projected population increases due to construction and operation would impact the ROI.

C. Provide a description of the potential impact of a similar population increase on the area within a reasonable commuting distance (e.g., 10 to 25 miles) of the proposed NEF.

- Sections 4.10.1.2 and 4.10.2.1 describe the impact of the anticipated population increase on the surrounding area. It states that the population increase from construction and operation workers would be less than a 1 percent increase over the existing population of Lea and Andrews Counties and therefore, have no significant impact on the area. However, it may be more reasonable to assume that both the construction and operation work forces that relocate to the area would move within the ROI rather than dispersing equally throughout the combined 15,268 km^2 (5,895 mi^2) area of Lea and Andrews Counties.

LES Response

A. LES will revise ER Section 3.10 and 4.10.1 in the next revision to the ER as follows:

- Section 3.10 will be revised to state: "The primary labor market for the operation of the proposed facility will come from within about 120 km (75 mi) of the site."

- ER Section 4.10.1 will be revised to state: "The bulk of this labor force is expected to come from the surrounding 120-km (75-mi) region due to the relatively low population of the local site area (Table 3.10-3, Civilian Employment data, 2000)."

The basis for selection of the 120 km (75 mi) radius is that it encompasses the Midland-Odessa, Texas area which is approximately 103 km (64 mi) to the southeast. This is the farthest distance from which LES expects the bulk of the labor force to originate.

B. The impact estimates provided in ER Section 4.10 are based on the combined population of Lea and Andrew counties. The population in New Mexico and Texas within about 120 km (75 mi) of the site is larger than the combined population of Lea and Andrews counties. Therefore, the projected increase in population reported in Section 4.10 would be reduced if spread over the area within 120 km (75 mi) of the site due to the higher population. This is the case for both the construction and operation periods. This minor increase in population would produce a minor impact on population characteristics, economic trends, housing, community services (health, social and educational resources), and the tax structure and distribution within 120 km (75 mi) of the site during both the construction and operation period.

C. As shown in ER Table 3.10-1, the population of Lea County, New Mexico was approximately 55,511 in 2000. The three closest population centers to the site in Lea

County are Eunice at 8 km (5 mi), Hobbs at 32 km (20 mi), and Jal at 37 km (23 mi). The populations of these three areas in 2000 were approximately 2,562, 28,657, and 1,996, respectively, providing a combined total population of approximately 33,215. If the entire construction phase population increase of 360, reported in ER Section 4.10.1.2, is assumed to relocate to these three areas, a total construction phase population increase of approximately 1.1 percent would result.

As shown in ER Table 3.10-1, the population of Andrews County, Texas, was approximately 13,004 in 2000. The two closest population centers in Andrews County to the site are Andrews and Seminole at 51 km (32 mi) each. The populations of these two areas in 2000 were 9,652 and 5,910, respectively. It is reasonable to assume that the population increase due to the NEF construction and operation would mostly relocate to this representative set of nearby population centers: Eunice, Hobbs and Jal, New Mexico, and Andrews and Seminole, Texas. All five locations are within 51 km (32 mi) of the site and are reasonable commuting distances for this region of the country. These five areas have a combined population of 48,777. If the construction phase population increase of 360 is assumed to relocate to all five of the nearby locations (Eunice, Hobbs, Jal, Andrews, and Seminole), a total construction phase population increase of approximately 0.7 percent would result.

A significant number of operational jobs are likely to be filled by residents already living in the region. Therefore, the population increase during operation of the proposed NEF would be less than during facility construction since fewer workers are expected to relocate to the area. The small population increase of approximately 360 during the construction phase is not expected to have a significant impact on the area. Because the population increase during operation is expected to be smaller than the expected population increase during construction, a similar conclusion applies concerning the impact on the area during the operational period of the NEF.

The minor increase in population would produce a minor impact on population characteristics, economic trends, housing, community services (health, social and educational resources), and the tax structure and distribution within Eunice, Hobbs and Jal, New Mexico, and Andrews and Seminole, Texas, during both the construction and operation periods of the NEF.

4-4 Air Quality Impacts:

A. Provide the XOQDOQ model input files used to generate the air quality impact data from the proposed NEF operation in Section 4.6.2.3.

B. Provide the calculations used in estimating the HF and radiological releases from the proposed NEF during operation and decommissioning as identified in Section 4.6.

C. Provide specific information on the plume from the cooling tower as discussed in Section 4.6.3 including:
   1.) Height of plume,
   2.) Areal extent of plume,
   3.) Duration of plume, and
   4.) Extent and duration of fog from plume.

D. Provide the gaseous release points for each radionuclide (at least for the Technical Support Building Gaseous Effluent Vent System (GEVS), Separations Building GEVS, Confinement Ventilation System, and the Centrifuge Test and Post Mortem Facility unless other potential ventilation release points are identified). Information should include:
   1.) Exit area of the stacks,
   2.) Exit height of the stacks,
   3.) Height of release buildings,
   4.) Height of adjacent structure,
   5.) Exit velocity of the stacks,
   6.) Exit temperature of the stacks, and
   7.) Annual released activity (μCi) by radionuclide including uranium daughters.

E. Provide the location, quantity, and source for the emission rates from the release points listed above at the proposed NEF during site preparation, construction, and decommissioning.

F. Provide emission factors, tons of daily emissions, number of vehicles and heavy duty engines, and estimated traffic increases during construction and operation.

LES Response

A. LES has provided a compact disc as an enclosure to this submittal containing the electronic XOQDOQ model input files used to generate the air quality impact data from the proposed NEF operation in Section 4.6.2.3. The XOQDOQ input file for the Technical Services Building (TSB) to the site boundary is provided as file name "run2.in" and the XOQDOQ input file for the Centrifuge Assembly Building (CAB) to the site boundary is provided as filename "runcab.in." The TSB XOQDOQ input data includes the nearest resident, business, school, and church receptors.

B. As stated in ER Section 4.6.2.1, the HF and radiological gaseous effluent releases from the proposed NEF are expected to be less than 1 kg (2.2 lbs) HF and 10 g (0.022 lbs) of Uranium per year during operations. Estimates for the releases during the

decommissioning period were not provided in the ER, but would inherently be substantially less. These values of gaseous effluent are based on operational experience at the Urenco Capenhurst Limited (UCL) enrichment facility in the United Kingdom.

For purposes of radiological impact analysis (refer to ER Section 4.12.2), the expected 10 g (0.022 lbs) of Uranium released per year was conservatively increased for the ER analysis to an equivalent value of 8.9 MBq/yr (240 μCi), or a 28-fold increase over what would be expected from the operational experience data, even after parameters were scaled where appropriate to account for the differences in plant throughput and air exhaust rates. Furthermore, this bounding value is supported on previous review by the NRC as documented in NUREG-1484, "Final Environmental Impact Statement for the Construction and Operation of Claiborne Enrichment Center." Since the NEF has been scaled up to a 3 million Separative Work Unit (SWU) capacity plant, the Claiborne gaseous pathway annual release (4.5 MBq/yr (120 μCi/yr)) was doubled to 8.9 MBq/yr (240 μCi/yr) for the NEF bounding impact estimate. This bounding release estimate was assumed over the life of the facility to conservatively cover unexpected operational differences in treatment equipment performance as well as initial periods from initial startup through build-out to full capacity, and final period of decommissioning which is expected to generate a fraction of the operational period gaseous releases.

As such, there was no "calculation" associated with the release values provided in ER Section 4.6.

C. The proposed NEF Cooling Water System design incorporates closed circuit hybrid cooling towers. These types of cooling towers allow for multiple modes of operation consisting of both wet and dry cooling. Selecting the appropriate mode of operation for the existing meteorological conditions and plant heat load minimizes the plume from the cooling tower. During the cooler months of the year when the potential of a plume is the greatest, the cooling towers will be operating in the dry mode and so there will be no visible plume. During the warmer months of the year, when the cooling tower spray pumps are operating, the discharge air is preconditioned with dry heat by the cooling tower dry coil. This preconditioning minimizes the cooling tower's resulting plume.

Upon completion of the Cooling Water System design, details of the duration, height, areal extent of the plume, and any resulting fog will be quantified and incorporated in the ER.

D. Design information for each of the effluent release points is presented in Table ER RAI 4-4D.1, "Effluent Release Point Design Parameters," in Attachment 2 to this submittal. Figure ER RAI 4-4D, "Release Point Locations," in Attachment 3 to this submittal shows the locations of the release points. The primary release pathways for radioactivity discharged from the facility is via the Technical Services Building (TSB) and Separation Building Gaseous Effluent Vent Systems (GEVS). Both of these exhaust stacks, as well as the TSB Confinement Ventilation System stack, are located on the TSB roof. In the preliminary design, 63% of the Uranium discharged is expected to be released via the TSB GEVS, with the remaining 37% estimated for Separation Building GEVS. Only trace amounts of Uranium are associated with the TSB Confinement Ventilation System and the Centrifuge Assembly Building Centrifuge Test and Post Mortem Facility exhausts and as such are not expected to release any detectable radioactivity above system background.

The expected isotopic release mix resulting from the estimated annual release of 10 g (0.022 lbs) of Uranium is provided in Table ER RAI 4-4D.2, "Annual Effluent Releases," in Attachment 2 to this submittal. For gaseous effluents derived from the sublimation of Uranium Hexafluoride (UF_6), no significant amount of particulate Uranium progeny are expected to be introduced into the process system and be released to the environment after GEVS filtration.

E. During a May 14, 2004, conference call between LES and NRC representatives, the NRC provided a clarification for RAI 4-4E. RAI 4-4E should read: "Provide the location, quantity, and source for the emission rates from all release points at the proposed NEF during site preparation, construction, and decommissioning."

Emission types during site preparation are described in ER Section 4.6.1 as exhaust emissions from construction vehicles on-site and fugitive dust from vehicle traffic on unpaved surfaces, earth moving, excavating, and bulldozing, and to a lesser extent from wind erosion. The total annual emissions of hydrocarbons predicted from the site are approximately 4,535 kg (5 tons) as discussed in ER Section 4.6.1. The calculated Total Work-Day Average Emissions result for fugitive dust is 2.4 g/s (19.1 lb/hr) as provided in ER Table 4.6-1.

The location, quantity, and source for the emission rates for all release points at the proposed NEF during construction are provided in Table ER RAI 4-4E.1, "Construction Emission Types," in Attachment 2 to this submittal.

The location, quantity, and source for the emission rates for all release points at the proposed NEF during decommissioning are provided in Table ER RAI 4-4E.2, "Decommissioning Emission Types," in Attachment 2 to this submittal.

Section 4.6 will be revised to incorporate this information in the next revision to the ER.

F. <u>Traffic Increases</u>

The maximum potential increase to traffic due to construction workers is 800 roundtrips per day. This value is based on the peak number of construction workers. The maximum potential increase to traffic due to construction deliveries and waste removal is 10,318 roundtrips over the site preparation and major building construction period. This value is based on the estimated number of material deliveries and construction waste shipments during the three-year period of site preparation and major building construction. This value does not include the number of truck deliveries for centrifuge and process equipment since this information is not available at this time.

The maximum potential increase to traffic due to operational workers is 210 roundtrips per day. This value is based on the size of the operational work force. The maximum potential increase to traffic due to operational deliveries and waste removal is 4,300 roundtrips per year. This value is based on an estimated 1,500 radiological shipments per year (see the response to RAI 4-6B; 1,500 is the sum of maximum shipments from Table ER RAI 4-6B.3, "Annual Shipment to/from NEF (by Truck)," plus 2,800 non-radiological shipments per year (see the response to RAI 4-6C)).

Air Emissions During Construction:

During the three-year period of site preparation and major building construction, offsite air quality will be impacted by passenger vehicles with construction workers commuting to the site and trucks delivering construction materials and removing construction wastes. Emission rates from passenger vehicle exhaust were estimated for a 64.4-km (40-mi) roundtrip commute for 800 vehicles per workday. No credit was taken for the use of car pools. Emission rates from delivery trucks were estimated for a 322-km (200-mi) roundtrip for 14 vehicles per workday. It was assumed that there are 250 workdays per year (five-day work week and fifty-week work year). Emission factors are based on EPA AP-42, Compilation of Air Pollutant Emission Factors, Volume II: Mobile Sources, dated 1991. The resulting emission factors, tons of daily emissions, number of vehicles and heavy duty engines are provided in Table ER RAI 4-4F.1, "Offsite Vehicle Air Emissions During Construction."

The construction estimates for daily emissions are based on the average number of trucks per day. There will be peak days, such as when large concrete pours are executed, where there will be more than the average number of trucks per day. This peak daily value of truck trips is not available at this time. It is estimated, however, that the daily emission values presented in Table ER RAI 4-4F.1 that are based on the average number of trucks could be about an order of magnitude higher on the peak days.

Air Emissions During Operation:

During operation, offsite air quality will be impacted by passenger vehicles with NEF workers commuting to the site, delivery trucks, UF_6 cylinder shipment trucks, and waste removal trucks. Emission rates from passenger vehicle exhaust were estimated for a 64.4-km (40-mi) roundtrip commute for 210 vehicles per workday. No credit was taken for the use of car pools. Emission rates from trucks were estimated for an average distance of 805 km (500 mi) for 18 vehicles per workday. Emission factors are based on EPA AP-42 dated 1991. The resulting emission factors, tons of daily emissions, number of vehicles and heavy duty engines are provided in Table ER RAI 4-4F.2, "Offsite Vehicle Air Emissions During Operations."

4-5 Noise Impacts:

Predict the noise level at the proposed NEF boundary during construction.

LES Response

As stated in ER Section 4.7.1.1, noise generated from construction equipment (i.e., backhoes, front loaders, bulldozers, dump trucks, cement mixers, cranes, compressors, generators and pumps) would range from 87 to 99 decibel units per the A-weighted scale (dBA) at approximately 9.1 meters (30 feet). As shown on ER Figures 1.2-4 and 6.1-2, the nearest manmade structures to NEF boundaries, excluding the two driveways, are the Site Stormwater Detention Basin and the Visitor Center at the southeast corner of the site. The southern edge of the Site Stormwater Detention Basin is approximately 15.2 meters (50 feet) from the south perimeter fence and approximately 53.3 meters (175 feet) from New Mexico Route 234. The eastern edge of the Visitor Center is approximately 68.6 meters (225 feet) from the east perimeter fence. As stated in ER Sections 3.7 and 4.7.5, considering that the sound pressure level from an outdoor noise source decreases 6 decibel units (dB) per doubling of distance, the highest noise levels are predicted to be within the range of 84 to 96 dBA at the south fence line during construction of the Site Stormwater Detention Basin and between 72 to 84 dBA at the east fence line when the Visitor Center is built. As shown in ER Table 3.7-2, these predicted noise level ranges fall within unacceptable sound pressure levels as determined by the US Department of Housing and Urban Development. ER Section 4.2.3 states that New Mexico Route 234 is a main trucking thoroughfare for local industry and ER Section 3.1 states that a landfill is south/southeast of the NEF across New Mexico Route 234 and that the adjacent property to the east of the NEF is vacant land. Therefore, there are no sensitive receptors at the NEF south and east boundaries. In addition, noise levels in the predicted ranges at the south and east fence lines would only be for a short duration and only during construction of the portions of both structures closest to the fences.

Noise levels generated during construction of the driveways would be comparable to traffic noise along the highway and would only be for a short period of time. Noise levels at other NEF boundaries during construction should be less since other construction activities will typically be further from the property lines.

In summary, the highest noise levels during construction are predicted to be within the range of 84 to 96 dBA at the south fence line during construction of the Site Stormwater Detention Basin and between 72 to 84 dBA at the east fence line when the Visitor Center is built. Noise levels in the predicted ranges at the south and east fence lines would only be for a short duration and only during construction of the portions of both structures closest to the fences. The south fence line is about 38.1 meters (125 feet) from New Mexico Route 234 and the east fence line is adjacent to vacant land.

4-6 Transportation Impacts:

A. Provide the following information for the shipments of supplies and materials to the proposed NEF and wastes from the proposed NEF during construction:
   1.) Mode of shipment (rail, truck, etc.),
   2.) The type of material,
   3.) Origin or destination of each type of shipment (e.g., Lea County Landfill), and
   4.) Estimated number of shipments by material type for each year of construction.

B. Provide for all radioactive shipments (e.g., feed material, product, depleted Uranium, low-level waste, contaminated empty Type 48X, 48Y, and 30B cylinders, etc.) to or from the proposed NEF by truck or rail, the following information:
   1.) Curie content by isotope,
   2.) Radiation at 1 meter from the surface,
   3.) Estimated number of annual shipments,
   4.) Estimated number of packages per shipment,
   5.) Air pollution impacts from normal transportation,
   6.) Estimated number of traffic accidents,
   7.) Radiological and/or chemical impacts from potential accidents, and
   8.) Origin or destination of the shipments.

C. For all non-radioactive shipments (operating supplies, office products, chemicals, empty Type 30B cylinders, etc.) to the proposed NEF, provide the annual number of truck and rail deliveries and shipments expected during operation.

D. For all non-radiological waste shipments from the proposed NEF during operation, provide the following information:
   1.) Place of origin onsite and number of each type of waste shipment, and
   2.) Destination of waste, including current number of annual deliveries to the waste receiver and remaining capacity of the disposal sites.

E. Verify and provide an example of the calculations used to generate the dose equivalent of 9.47 rem to a driver during normal transport in Section 4.2.7.6.

- Sections 2.3 and 4.2.7.6 states that the annual dose equivalent for a truck driver during incident-free transportation is 9.47 rem. Regarding the feed shipments from Ontario, Section 2.3 does not state that the dose per shipment is a collective dose. However, Section 4.2.7.6 appears to indicate that the dose is collective, cumulative over the life of the proposed NEF, and based on 2 drivers per shipment.

LES Response

A. Information on shipments of construction supply and waste materials to and from the proposed NEF site during the peak three year period of plant construction is provided in Table ER RAI 4-6A.1a, "Supply Materials Shipped to the Proposed NEF Construction Year 1," Table ER RAI 4-6A.1b, "Supply Materials Shipped to the Proposed NEF

Construction Year 2," and Table ER RAI 4-6A.1c, "Supply Materials Shipped to the Proposed NEF Construction Year 3," for construction supply materials and Table ER RAI 4-6A.2a, "Waste Materials Shipped from the Proposed NEF Construction Year 1," Table ER RAI 4-6A.2b, "Waste Materials Shipped from the Proposed NEF Construction Year 2," and Table ER RAI 4-6A.2c, "Waste Materials Shipped from the Proposed NEF Construction Year 3," in Attachment 2 to this submittal for waste materials. Information on shipments of centrifuge equipment is not available at this time and is not included in the tables.

B. 1) Curie Content by isotope:

Table ER RAI 4-6B.1, "Container Curie Content by Isotope," in Attachment 2 to this submittal provides the radioactivity content for each container type expected to be transported to or from the NEF site. The values are based on assumptions used to establish a conservative estimate of dose rate from each container, i.e., the in-growth of Uranium progeny has been assumed for a one-year period since the most important radionuclides (as external dose rate contributors) in the decay chains attain secular equilibrium within this time. Actual shipment of feed and product cylinders is expected in time frames shorter than 1 year.

The "heels" refer to empty cylinders (types 48X and 48Y) containing the Uranium progeny remaining in the feed cylinders after all UF_6 has been removed.

Solid waste was assumed to be contaminated with natural Uranium at the level of 10 nanoCi/g which represents the regulatory limit specified in 10 CFR 61.55 for Class A waste.

2) Radiation at 1 meter from the surface

Table ER RAI 4-6B.2, "Estimated Dose Rates from UF_6 and Waste Containers," in Attachment 2 to this submittal provides the estimated dose rates from each of the containers used in the shipment of UF_6 materials (feed, product or depleted Uranium cylinders) and radwaste packages (55 gallon drums). The dose rates assume one-year decay and in-growth of Uranium progeny.

3) Estimated number of annual shipments

The estimated number of annual shipments is presented in Table ER RAI 4-6B.3, "Annual Shipments to/from NEF (by Truck)," in Attachment 2 to this submittal. At this time, all radioactive shipments are anticipated to be trucked to and from the site.

4) Estimated number of packages per shipment

The number of actual packages per truck shipment varies depending on the type of container being used. Feed material supplied in 48Y cylinders are shipped one per truck. If 48X cylinders are used to provide feed material, these are typically shipped two per truck. Enriched Uranium product 30B cylinders are typically shipped two per truck, although up to five cylinders per truck can be shipped. Solid waste shipments are assumed to contain 60 fifty-five gallon drums per shipment. Depleted Uranium material will typically be shipped in 48Y cylinders, one per truck.

5) Air pollution impacts from normal transportation

ER Table 4.2-1 provides a list of possible radioactive material transportation routes. This table, with additional information on emission factors for Heavy Duty Diesel Powered Vehicles (on-road) from EPA AP-42, "Compilation of Air Pollutant Emission Factors," 5th Edition, November 24, 2000, and subsequent pollution impacts, is provided in Table ER RAI 4-6B.4, "Annual Air Pollution Impacts from Normal Transportation," in Attachment 2 to this submittal for each potential destination or shipment origin.

6) Estimated number of traffic accidents

Based on the crash statistics of large trucks transporting all types of radioactive materials in the US between 1999 and 2001 (Federal Motor Carrier Safety Administration (FMCSA), Department of Transportation (DOT): FMCSA-RI-02-011, "Large Truck Crash Facts 2001," FMCSA-RI-02-003, "Large Truck Crash Facts 2000," and DOT-MC-01-104, "Large Truck Crash Facts 1999"), an average accident rate of approximately 4.7 accidents per year has been determined for this class of hazardous materials. Conservatively estimating that the 1,500 annual truck shipments to and from the NEF represent less than 10% of all US truck shipments of radioactive materials, the estimated numbers of accident events that could be associated with the NEF are shown in Table ER RAI 4-6B.5, "Annual Transportation Accidents," in Attachment 2 to this submittal.

7) Radiological and/or chemical impacts from potential accidents

Text removed under 10 CFR 2.390.

Text removed under 10 CFR 2.390.

8) Origin or destination of the shipments

The transportation points to and from the NEF site in New Mexico are presented in Table ER RAI 4-6B.6, "Transportation Destinations (To/From) NEF," in Attachment 2 to this submittal.

C. At this time it is anticipated that the rail line would not be utilized for normal operation deliveries. Therefore, there are no rail deliveries or shipments to consider during routine operation. The number of truck deliveries during operation is estimated to be 2,800 per year.

D. NEF on-site generated non-radiological wastes will consist of solid and liquid wastes. These can be sub-classified as "hazardous" in accordance with 40 CFR 261, "Identification and listing of hazardous waste," or non-hazardous. The quantities of annual, non-radiological wastes are listed in Table 3.12-2 in the ER.

1) Non-radiological, Hazardous Wastes

As reflected in ER Table 3.12-2, the annual volumes of non-radiological hazardous wastes are small. These wastes, which are principally from maintenance operations in the Technical Services Building, will be disposed of at a facility that accepts hazardous wastes. Since the quantities of hazardous wastes are small, it is reasonable to expect these wastes would be shipped approximately four times per year. It is expected that each shipment will contain a total volume of approximately 1,609 liters (425 gallons) of non-radiological hazardous waste.

Non-radiological, Non-hazardous Wastes

As reflected in ER Table 3.12-2, non-radiological, non-hazardous wastes primarily consist of miscellaneous combustible wastes, miscellaneous scrap metals, spent vehicle motor oil, spent vehicle oil filters and building ventilation air filters. Non-radiological, non-hazardous wastes come from various operations throughout the facility, and will be disposed of at a standard waste disposal site (e.g., landfill).

The estimated volume of building ventilation air filters for disposal will fill approximately 185 (8-cubic yard) dumpsters per year. It is expected that the waste disposal company will unload at least two of these dumpsters into the truck per trip. Therefore, approximately 93 truck shipments per year are expected for disposal of these filters.

Based on discussions with waste disposal companies and experience, it is expected that all other non-radiological, non-hazardous wastes would fill two (8-cubic yard) dumpsters per week. It is expected that the waste disposal company will empty these dumpsters every week using one truck. Therefore, approximately 52 truck shipments per year are expected for disposal of the non-radiological, non-hazardous wastes.

Total Non-radiological Waste Shipments

Based on the above, it is expected that approximately 150 truck shipments would be required per year to remove all non-radiological wastes from the NEF.

2) Non-radiological, Hazardous Waste Disposal Sites

The non-radiological, hazardous wastes will be transported to a local or regional Resource Conservation Recovery Act (RCRA)-approved treatment, storage, and disposal facility (TSDF). A local TSDF is the Waste Control Specialists (WCS) facility adjacent to the NEF site. The WCS is a storage and treatment facility with a permitted disposal area that can accommodate more than 8.4 million cubic meters (11 million cubic yards) of waste, which is equivalent to approximately 100 years of facility life. Regional TSDFs include Safety-Kleen Corporation in Albuquerque, New Mexico, or El Paso and Amarillo, Texas. Safety-Kleen provides waste treatment services. After treatment, the waste is sent to a third-party disposal facility, which varies depending on the type of waste. The annual number of deliveries to a non-radiological hazardous waste receiver is expected to be approximately four.

Non-radiological, Non-Hazardous Waste Disposal Sites

The non-radiological, non-hazardous wastes will be disposed of at a nearby landfill. The Lea County Landfill has a remaining capacity of more than 50-years, which is expected to be adequate for disposal of NEF wastes and other local area wastes. Other regional landfills (e.g., Sand Point in Eddy County, New Mexico) are also options for disposal of this type of waste material. The annual number of deliveries to the non-radiological, non-hazardous waste receiver is expected to be no more than 150.

E. The basis for computation of the driver exposure time was taken from NUREG/CR-0130, "Technology, Safety and Costs of Decommissioning a Reference Pressurized Water Reactor Power Station" (June 1978), Section 11.4.1, which states the following transportation assumptions:

Number of drivers	2
Transportation time	1,000 miles per 24-hr day
Time outside truck	2 hrs per 1000-mile trip
Average distance from truck while outside truck:	2 m (6.6 ft)

For dose rates off the truck, the receptor was assumed to be on the side of the container, at mid length (i.e., at the worst-case position). The cab dose drivers were also taken at 2 m (6.6 ft), on the axis for the feed, product, and tails containers, and on the side for the waste drums.

For example, the calculated driver dose rates for a shipment of 48Y feed cylinders from Port Hope, Ontario, to NEF (approximately 1,780 mi) is based on:

- Inside cab driver dose rate 7.247E-02 mrem/hr
- Outside cab driver dose rate 1.403E-01 mrem/hr

The transportation dose to a truck driver per shipped container was calculated by multiplying the cab dose rate times 24 hours (the travel time for a 1,000-mile trip), adding to that an additional 2-hour dose due to standing outside the truck at 2 m (6.6 ft) from the side of the container, and then multiplying the total dose by the truck distance traveled (in 1,000-mile units). The result was then multiplied by 2, the number of truck drivers per shipment.

Dose per 1,000 mile trip, and dose per mile:

= [dose while in cab] + [dose while outside cab]
= [7.247E-02 (mrem/hr) x 24 (hrs)] + [1.403E-01 (mrem/hr) x 2 (hrs)]
= 2.020 (mrem/1,000 miles)
= 2.020E-03 (mrem/mile)

Dose per trip:

= 2.020E-03 (mrem/mile) x 1,780 (miles) x 2 drivers x 1.0E-03 (rem/mrem)
= 7.191E-03 person-rem/trip

Annual Dose:

= 7.19E-03 person-rem/trip x 690 trips/year
= 4.96 person-rem/year (as given in Table 4.2-2 of the ER).

Total doses were conservatively estimated for any single route by linearly summing the doses from each container being individually transported along that route. This is conservative because no consideration was given to the shielding effect of multiple containers on a single truck, or to differences in the dose point distances due to shipment loading of multiple containers.

The driver dose of 9.49 person-rem (note the correction from 9.47, a typo) reported in Section 4.2.7.6, corresponds to the following hypothetical worst-case transportation routes (from Table 4.2-2):

- Ship 690 feed cylinders (48Y) from Port Hope, Ontario:	4.96	person-rem/yr
- Ship 350 product cylinders (30B) to Wilmington, NC:	1.01	person rem/yr
- Ship 160 fifty-five gallon drums to Barnwell, SC:	0.015	person-rem/yr
- Ship 625 depleted UF_6 in 48Y cylinders to Portsmouth, OH	3.50	person-rem/yr
Total:	9.49	person-rem/yr

The driver dose of 9.49 person-rem (note the correction from 9.47, a typo) reported in ER Sections 2.3 and 4.2.7.6 is a total driver dose for all annual shipments to the two drivers in each truck. The reported dose is not cumulative over the life of the proposed NEF. In the next revision to the ER, Section 2.3 will be revised to reflect "per year" cumulative dose impacts for all categories.

4-7 Public and Occupational Health Impacts:

A. Provide a discussion on how the Urenco's Capenhurst Plant occupational exposures and occupational injury rates are valid for the proposed NEF.

- Section 3.11.2.1 states that "occupational injury rate at the proposed NEF is expected to be similar to other operating uranium enrichment plants." Table 3.11-1 provides lost time accidents at the Capenhurst Plant. Although the proposed NEF would be similar in operation to the existing Capenhurst Plant, the proposed NEF would produce twice as many SWUs as the Capenhurst Plant.

B. Identify whether the size of the onsite workforce at the proposed NEF would be the same as at the Capenhurst Plant.

C. Provide the level of education, experience, and safety training at the Capenhurst Plant.

D. Provide the education and safety training planned for the proposed NEF.

E. Provide a description of the column "Target Max LTAs" in Table 3.11-1.

F. Provide a discussion of the non-radiological accidents in Section 4.12.3 to the public, workers, and equipment or provide justification why no such discussion is needed.

G. Justify the assumption used in the liquid effluent dose assessment in Section 4.12.2.1.2 that "the TEEB is assumed to be dry no more than 10 percent of the time."

- The pan evaporation rate for southeastern New Mexico and western Texas is approximately 80 inches per year. From Figure 4.12-2, the areal extent of water in the TEEB is approximately 30,000 - 50,000 square feet. Therefore, the expected annual evaporation rate could be expected to remove at least 1,500,000 gallons per year from the TEEB. With an expected annual treated liquid effluent volume of not more than 670,000 gallons, the TEEB would likely remain mostly dry, rather than mostly wet. As a result, the sludge would be subjected to wind erosion and suspension more than 10 percent of the time.

LES Response

A. The existing Urenco Capenhurst Limited (UCL) plant, referred to in RAI 4-7A, is the E23 plant. The output of the proposed NEF is approximately twice the output of the E23 plant. However, the Capenhurst site includes the A3, E22, and E23 enrichment plants. The lost time accidents data provided in ER Table 3.11-1 includes data for the A3, E22 and E23 enrichment plants The present Capenhurst combined site output for these plants is 2.96 million Separative Work Units (SWUs) compared to the proposed 3 million SWUs for the NEF. Because the operations at both sites are similar, the occupational injury exposure and rates can be considered comparable. Therefore, based on the SWU equivalence, the occupational exposure and injury rates from the Capenhurst site are considered to be appropriate for estimating the occupational exposure and injury rates for the proposed NEF.

B. The on-site work force at Capenhurst is 270, which includes both the enrichment operation and other operations personnel at the site. At NEF, the on-site work force will be 210. The staff work forces are similar at the two sites when considering only the work force that supports enrichment operations.

C. The average worker at Capenhurst has 20.5 years of nuclear experience. The educational system in the United Kingdom differs from the educational system in the United States. The Higher National Certificate (HNC) is approximately equivalent to two years full-time schooling. The HNC is required for entry to a four-year university. Approximately 30% of the Capenhurst work-force attended a university. The average worker has 3.2 years of education at the HNC level and higher. The equivalent qualifications and training for the NEF workforce are provided in response to RAI 4-7D, below.

Safety training is carried out for all site personnel using an induction manual and through the use of specific safety instructions for contractors. The induction manual used for safety training provides all new Urenco employees with an understanding of the conditions, procedures, and safety principles required on-site. The manual has 10 modules that cover topics such as security, safety, emergency alarms and actions. The safety module covers safety instructions, which are mandatory for all personnel and are used to ensure compliance with regulatory and other health, safety, and environmental requirements. Safety instruction categories include administration, nuclear site license, industrial safety, ionizing radiation, occupational hygiene, and emergency planning.

The safety instruction used for safety training of on-site contractors at Capenhurst covers the procedures to ensure contractors have the competence and resources to perform their work safely and not endanger other plant personnel or the environment. Contractors also receive induction training and are supervised at all times while on site to ensure compliance with the relevant health, safety, and environmental management system requirements.

D. Safety training requirements are discussed in SAR Section 11.3.3.1, "General Employee Training." All persons under the supervision of facility management (including contractors) must participate in General Employee Training. In part, the scope of this training includes:

- Industrial safety, health and first aid
- Chemical safety
- Nuclear safety
- Emergency Plan and implementing procedures
- Use of dosimetry
- Use of equipment and protective clothing

Additionally, Job Hazard Analysis (JHA), sometimes referred to as Job Safety Analysis (JSA) (i.e., a step-by-step process used to evaluate job hazards), will be used as part of on-the-job training for providing employees the skills necessary to perform their jobs safely at the NEF.

The safety training for the NEF will comply with the applicable sections of Occupational Safety and Health Administration (OSHA) regulations such as 29 CFR 1910

(Occupational Safety and Health Standards), 1910.1200 (Hazard Communication) and NRC's regulations 10 CFR 20 (Standards for Protection Against Radiation) and 10 CFR 19 (Notices, Instructions and Reports to Workers: Inspection and Investigations).

The level of education requirements for the NEF workforce by job description/title is provided in response to RAI 7-1A, item 3. Specifically, refer to Table ER RAI 7-1A.1, "Descriptions of Job Types During Operation," in Attachment 2 to this submittal for these details.

E. ER Table 3.11-1, "Lost Time Accidents in Urenco Capenhurst Limited (UCL)," tabulates lost time accidents (LTAs) for the Urenco Capenhurst facility for the years 1998-2002. The term "target maximum number of LTAs" is used in the Health, Safety and Environment Report published by Urenco (Capenhurst) Limited. Urenco has stated that the desirable number of lost time accidents is zero; however, a target maximum is set each year as shown in ER Table 3.11-1. The intent is to foster improvement over time and ultimately bring the goal down to zero. The target maximum for the number of lost time accidents at the NEF will be set at zero.

F. A review of injury reports for the Capenhurst facility was conducted for the period 1999-2003. No injuries involving the public were reported. Injuries to workers occurred due to accidents that occurred in parking lots and office environments as well as in the plant. The typical causes of injures sustained at the Capenhurst facility are summarized in Table ER RAI 4-7F.1, "Causes of Injuries at Capenhurst (1999-2003)," in Attachment 2 to this submittal. Non-radiological accidents to equipment that did not result in injury to workers are not reported.

G. In estimating the projected annual dose from liquids released into the TEEB to an individual at the site boundary, the initial operating assumption was that the basin is dry only 10% of the time. This was made in order to estimate the duration of dust re-suspension from the basin into the air. The actual duration that the basin remains dry over a year is dependent on the final design of the TEEB. Final design considerations will take into account the As Low As Reasonably Achievable (ALARA) aspects of maximizing the duration that the basin remains wet in order to minimize to the extent practicable, the potential re-suspension of solids from the basin into the air, thereby minimizing the dose impact.

The predicted maximum exposure at the site boundary from re-suspended solids out of the TEEB results in a very small effective dose equivalent of 1.75E-05 mSv/yr (1.75E-03 mrem/yr). If it is assumed that the basin is dry almost an entire year allowing for a ten-fold increase in the projected dose, the resulting maximum dose equivalent of 1.75E-04 mSv/yr (1.75E-02 mrem/yr) is still a small fraction of the 10 CFR 20.1301 dose limits for members of the public. Similarly, the maximum organ committed dose equivalent from liquid releases would increase from 1.45E-04 mSv/yr (1.45E-02 mrem/yr) to 1.45E-03 mSv/yr (1.45E-01 mrem/yr), which is below the 40 CFR 190 dose limits for members of the public.

4-8 Waste Management Impacts:

A. Describe the efforts planned to recover recyclable materials such as metals, papers, etc. during both construction and operation of the proposed NEF.

B. Provide external and internal effluent monitoring data for at least five years of operation at the Capenhurst and Almelo facilities for all waste streams (gaseous, liquid, and solid), if available. If data is available, adjust as appropriate for any operational differences between the Capenhurst and Almelo facilities and the proposed NEF.

- Sections 3.12 and 4.13 note that the proposed NEF would be similar in operation to the existing Capenhurst and Almelo facilities.

C. Provide all radionuclides and chemicals that are routinely monitored and any abnormal release measurements at the Capenhurst and Almelo facilities.

D. Provide the average, maximum, and minimum volumetric and uranic concentration and HF concentrations over each annual year of data that are equivalent to the proposed NEF evaporative discharge and laundry liquid effluent streams from the Capenhurst and Almelo facilities.

E. Identify the specific regulations that would be followed for disposal of effluent materials unsuitable for the evaporative disposal or for release to the TEEB.

- Sections 3.4.1.2 and 4.4.7 state "... effluents unsuitable for the evaporative disposal will be removed off-site by a licensed contractor in accordance with regulatory requirements" and "effluents unsuitable for release to the TEEB are processed onsite or disposed of offsite in a suitable manner in conformance with pertinent regulations."

LES Response

A. A discussion of the efforts planned to recover recyclable materials will be incorporated in the next revision to the ER. At the current state of conceptual design for the proposed NEF, the construction plan has not been developed enough to determine how much of the construction debris would be recycled. As such, there is no plan in place at this time to recycle construction materials. A recycling program will be developed as the design progresses to final and the construction execution plan proceeds.

During operation, a non-hazardous materials waste recycling plan will be implemented. The recycling effort will start with the performance of a waste assessment to identify waste reduction opportunities and to determine which materials will be recycled. Once the decision has been made of which waste materials to recycle, brokers and haulers will be contacted to find an end-market for the materials. Employee training on the recycling program will be performed so that employees will know which materials are to be recycled. Recycling bins and containers will be purchased and shall be clearly labeled. Periodically, the recycling program will be evaluated (i.e., waste management expenses and savings, recycling and disposal tonnages) and the results reported to the employees.

The cost of disposal of radioactive-contaminated materials necessitates the decontamination and reuse of such materials where practicable. Chemical solutions, such as citric acid, are limited to minimize the volume of mixed waste.

B. External and internal effluent monitoring data for at least five years of operation at the Capenhurst and Almelo facilities are currently being assembled by Urenco to respond to this request. LES will provide the data and address operational differences between the Capenhurst and Almelo facilities and the proposed NEF in the near future.

C. Information on routinely monitored radionuclides and chemicals and any abnormal release measurements at the Capenhurst and Almelo facilities is currently being assembled by Urenco to respond to this request. LES will provide the information in the near future.

D. Urenco is currently assembling information related to the average, maximum, and minimum volumetric and uranic concentration and HF concentrations over each annual year of data that are equivalent to the proposed NEF evaporative discharge and laundry liquid effluent streams from the Capenhurst and Almelo facilities. LES will provide the data in the near future.

E. The State of New Mexico has adopted the US EPA hazardous waste regulations (40 CFR Parts 260 – 266, 268 and 270) governing the generation, handling, storage, transportation, and disposal of hazardous materials. These regulations are found in 20.4.1 NMAC, "Hazardous Waste Management." The ER will be revised to state that the NEF will comply with both the US EPA and the NMAC regulations governing the generation, handling, storage, transportation, and disposal of hazardous materials in the next revision to the ER.

4-9 Decommissioning Impacts:

A. Provide an assessment of the potential radiological and non-radiological impacts that would be associated with the decontamination and decommissioning activities. This assessment should include:
   1.) Number of workers required for decommissioning,
   2.) Change in worker qualifications for decommissioning versus operation,
   3.) Number of low-level waste shipments to a disposal facility, and
   4.) Number of normal trash and construction waste shipments.

B. Provide estimates of the deposition rate of uranium, fluorides, and other chemicals released from normal operation in the soil and the impacts of these accumulated depositions.

C. Identify the depth to which soil contamination may occur considering soil disturbances and wind erosion.

LES Response

A. Section 10.0, "Decommissioning" of the Safety Analysis Report (SAR) describes the decommissioning funding plan and provides information on the decommissioning of the NEF. The major cost of facility decommissioning is attributed to the dismantling, decontamination, processing, and disposal of centrifuges and other equipment in the Separations Building Modules, which are considered classified. The dismantling and decontamination of the equipment in the three Separations Building Modules will be conducted sequentially in three phases over a nine-year time frame. The first two phases will take place while the plant is still operating.

Inventories and wastes at the time of decommissioning will be in amounts that are consistent with routine plant operating conditions over time. Design features are also incorporated into the plant's initial design that will simplify dismantling and decontamination. These features include measures for airborne contamination control, separation of contaminated and non-contaminated process equipment to the extent practical, application of washable epoxy coating to certain floors and walls and the use of non-porous pipe insulation. In addition, operating procedures ensure that precautions are taken to minimize plant contamination during operation.

Given these considerations, the radiological and non-radiological impacts of decontamination and decommissioning are not expected to be significantly different from those encountered during routine operation of the facility. The annual dose equivalent accrued by a typical radiation worker at an operating Uranium enrichment plant is usually low, approximately 0.2 mSv (20 mrem).

An organizational strategy for decommissioning will ensure that adequate numbers of experienced and knowledgeable personnel are available to perform technical and administrative tasks required for decommissioning. As operations cease, the operations personnel will gradually migrate to decommissioning activities. Obviously, these workers will be knowledgeable about enrichment plants, but will require additional training in dismantling/decommissioning activities before such work begins. The cost model for decommissioning assumed a total of 21 workers dedicated to decommissioning activities. The staffing level for routine operations is 210.

It is estimated that a total of 961 truckloads of decommissioning waste will be shipped to a licensed disposal facility over the nine-year decommissioning period. The number of normal trash and construction waste shipments is expected to be similar to the number of construction material and waste shipments made during the construction period. The number of these shipments during construction is estimated at 10,318. These shipments are expected to be spread out over the nine-year decommissioning period.

B. ER Table 3.12-3 shows that the estimated annual gaseous effluent releases are expected to contain less than 10 g (0.022 lbs) of Uranium. In the process system, Uranium is in the form of UF_6, which when in contact with water vapor in air produces HF gas, and a uranyl fluoride (UO_2F_2), a solid that will tend to precipitate out and deposit on the ground. HF and other chemicals that might be trapped in gaseous effluents would only be in trace amounts that when dispersed in the atmosphere would not be expected to be detectable as a deposited quantity.

With respect to the primary release point (i.e., Technical Services Building roof), the most restrictive annual average deposition factor calculated for the site boundary (3.1E-08/m^2 from ER Table 4.6-3A) along with the annual Uranium release, a conservative estimate of the accumulated deposition (assuming no re-suspension with additional dispersion) of Uranium has been determined to be:

- Annual U deposition = 3.1E-07 g/m^2
- 30-year accumulation = 9.3E-06 g/m^2

With the above deposition rate, the expected soil concentration of Uranium can be estimated. As an example, if all the Uranium deposited from plant effluents is assumed to be contained in the top 15 centimeters (5.9 inches) of soil which has a surface density of 240 kg/m^2 (Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Radioactive Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I," Rev. 1, dated October 1977), and noting that the specific activity for U-238 per g of natural Uranium is 12.3 kBq/g (0.3328 μCi/g), the soil concentration of U-238 would be 4.8E-04 Bq/kg (1.3 E-02 pCi/kg) after 30 years. The application of the specific activity of isotopes per gram of natural Uranium is based on the estimation that the annual average release of Uranium from the plant is assumed to be made up of the Uranium content of feed material (UF_6), and the combination of all process UF_6 streams which is approximately equivalent to the isotopic mix of natural Uranium. The average background soil concentration of U-238 measured at the NEF site (see ER RAI Table 3-1A.2) is approximately 5.9 Bq/kg (158 pCi/kg), or about 12,153 times larger than the 30-year expected accumulated concentration from NEF operations. At these levels, the amount of plant deposition will be indistinguishable from the natural background.

C. Low rainfall, high evaporation and evapotranspiration rates in this part of New Mexico result in a limited liquid source that could drive any surface contamination downward. As a result, any air-deposited components from NEF facility releases are expected to remain in the soil near the surface. For the purposes of dose impact analysis, a depth of the top 15 centimeters (5.9 inches) of soil (plow layer) was assumed using the guidance of Regulatory Guide 1.109.

4-10 Waste Management Impacts:

A. Provide the details of the package types that would be used, shipment modes, and the quantity per shipment of each type of radioactive and mixed wastes and non-radiological wastes identified in Table 3.12-1 and Sections 3.12.2 and 4.13.4.2.

B. Provide the package surface dose rate and estimate the worker's exposure for processing, packaging, and shipping these waste streams.

LES Response

A. The intended package type for all radioactive, mixed, and hazardous wastes are 55 gallon drums meeting the general package design requirements of 49 CFR 173.410, "General design requirements." All shipments are planned to be by truck. Typical truck loads are expected to be between 60 and 160 drums per shipment, depending on such variables as weight and dose rate.

The shipment details for non-radiological wastes (hazardous and non-hazardous) are addressed in response to RAI 4-6D.

B. As stated in response to RAI 4-10A, it is intended that 55 gallon drums will be used at the NEF for shipping all radioactive, mixed and hazardous wastes. For drums containing solid radioactive waste materials, the estimated surface dose rate is 0.80 μSv/hr (0.080 mrem/hr).

At the Urenco Capenhurst Limited (UCL) site, the best measure of worker dose for waste handling activities is the dose received by the central material handling operators. At the UCL site, a shared central material handling facility provides waste processing services for the entire site. Since the site is jointly occupied by Urenco and BNFL, the central material handling operators handle radioactive materials for both companies. Therefore, portions of these operators' exposures are received from facilities that are not related to gas centrifuge enrichment operations. These operators also handle Uranium cylinders. At the UCL site, it is reported that the highest central material handling operator dose during the period 1999-2003 was 2.81 mSv (281 mrem) and the highest mean dose during the same period was 2.07 mSv (207 mrem).

At Urenco's Almelo facility, it is reported that workers receive < 1 mSv/yr (100 mrem/yr) processing, packaging, and shipping radioactive wastes associated with gas centrifuge enrichment operations. The Almelo exposure values for waste processing workers are typical of exposures expected at the NEF for workers processing, packaging, and shipping radioactive wastes.

4-11 Cumulative Impacts:

A. Provide the Walvoord and WCS referenced and unreferenced documentations for air (e.g., meteorological tower data), ground water (e.g., sample well information), and soil (e.g., soil analysis).

- Sections 3.3, 3.4, 4.4.2, and 4.6.4 cite or reference data obtained from WCS (such as Rainwater, 1996; TTU, 2000; WBG, 1998) and other sources (Walvoord, 2002) for the site characteristics.

B. Provide an assessment of the cumulative impacts from the proposed NEF construction and operations in relationship to existing and planned Quarry, Lea County Landfill, and WCS operations including the increase in total suspended particulate.

C. Describe potential releases from the proposed low-level radioactive waste disposal facility planned by WCS.

LES Response

A. LES has provided a compact disc as an enclosure to this submittal containing electronic files for the WCS meteorological data (as received from WCS). Also included are files that provide information on the data channels and units used by WCS. A file listing follows.

Filename: BK0011.TXT – Data from October 15, 1999 to December 8, 2000
Filename: RAD115.TXT – Data from November 24, 2000 to January 4, 2002
Filename: RAD117.TXT – Data from November 28, 2000 to August 29, 2002
Filename: RAD119.TXT – Data from December 29, 2002 to August 5, 2003
Filename: WCS Meteorological DataFormat.doc – Format of provided data

The document referenced by Walvoord, 2002, is copyrighted by the American Geophysical Union. The following is the information necessary to obtain a copy:

Deep Arid System Hydrodynamics, 1. Equilibrium States and Response Times in Thick Desert Vadose Zones, Water Resources Research, Vol. 38, No. 12, pp. 44-1 to 44-15, M.A. Walvoord, M.A. Plummer, and F.M. Phillips, 2002,

Copies of the following documents referenced in the ER are enclosed in Attachment 6 of this submittal:

Rainwater, 1996	Evaluation of Potential Groundwater Impacts by the WCS Facility in Andrews County, Texas, Prepared for Andrews Industrial Foundation, K. Rainwater, December 1996.
TTU, 2000	Geology of the WCS-Flying W Ranch, Andrews County, Texas, Prepared for Andrews Industrial Foundation, Texas Tech University Water Resources Center, April 2000.

WBG, 1998 Atomic Vapor Laser Isotope Separation (AVLIS), New Mexico, Technical Appendices, submitted by the State of New Mexico and Waste Control Specialists, LLC.

Copies of additional reports prepared by others that are enclosed in Attachment 6 include:

RCRA Permit Application for a Hazardous Waste Storage, Treatment and Disposal Facility, Andrews County, Texas, Section VI, Geology Report, prepared for Waste Control Specialists, Inc., prepared by Terra Dynamics Incorporated, March 1993.

Waste Control Specialists, 2002 Annual Groundwater Monitoring Report, prepared for Waste Control Specialists, LLC, prepared by Cook-Joyce, Inc., January 25, 2003.

Waste Control Specialists, Section VI, Geology Report, prepared for Waste Control Specialists, prepared by Cook-Joyce, Inc. and Intera, Inc., February 2004. (Includes main body of report, all tables, Figures 6.0-1 through 6.4-17 and Plates 6.2-2 and 6.2-3)

Copies of reports prepared for LES in support of the NEF that are enclosed in Attachment 6 include:

Hydrogeologic Investigation, Section 32; Township 21 Range 38, Eunice, New Mexico, prepared for Lockwood Greene Engineering & Construction, prepared by Cook-Joyce, Inc., November 19, 2003.

Report of Preliminary Subsurface Exploration, Proposed National Enrichment Facility, Lea County, New Mexico, prepared for Lockwood Greene, prepared by MACTEC Engineering and Consulting, Inc., October 17, 2003.

Groundwater Radiological Analytical Report for Monitoring Well MW-2, First Sampling Event, analyzed by Framatome ANP Environmental Laboratory, October 30, 2003.

Groundwater Radiological Analytical Report for Monitoring Well MW-2, Second Sampling Event, analyzed by Framatome ANP Environmental Laboratory, November 26, 2003.

Groundwater Radiological Analytical Report for Monitoring Well MW-2, Third Sampling Event, analyzed by Framatome ANP Environmental Laboratory, April 27, 2004.

Groundwater Non-radiological Analytical Report for Monitoring Well MW-2, First Sampling Event, analyzed by Severn Trent Laboratory, November 19, 2003.

Groundwater Non-radiological Analytical Report for Monitoring Well MW-2, Second Sampling Event, analyzed by Severn Trent Laboratory, December 22, 2003.

Groundwater Non-radiological Analytical Report for Monitoring Well MW-2, Third Sampling Event, analyzed by Severn Trent Laboratory, May 6, 2004.

Soil Radiological Analytical Report, First Sampling Event, analyzed by Framatome ANP Environmental Laboratory, November 5, 2003.

Soil Radiological Analytical Report, Second Sampling Event, analyzed by Framatome ANP Environmental Laboratory, April 27, 2004.

Soil Non-Radiological Analytical Report, Second Sampling Event, analyzed by Severn Trent Laboratory, April 29, 2004.

B. An assessment of cumulative impacts of the proposed NEF, in combination with neighboring facilities, during construction and operation is provided in ER Section 2.3. In particular, the assessment includes a discussion on potential decrements in air quality due to increase in total suspended particulates (TSPs). Most cumulative impacts (i.e., TSPs and noise) will occur during the eight-year construction period of the NEF with the majority occurring during the peak three-year period of site preparation and major building construction. Construction related cumulative impacts will, however, be transient. In addition, a lack of nearby receptors will limit any adverse impacts during this three-year period. Cumulative impacts during operation of the NEF will be less.

LES is not aware of any planned changes in future operations at the nearby quarry or the landfill. WCS is in the process of preparing a license application for a low-level radioactive waste disposal facility. Depending on whether WCS receives a license, some additional construction may occur at some point in the future at WCS.

C. WCS is presently planning to submit their low-level radioactive waste disposal facility license application later this year. It is expected that this application will provide information on potential releases from the proposed low-level radioactive waste disposal facility. Accordingly, information on potential releases from this planned facility is not available at this time. It is expected that cumulative effects of the operation of the low-level radioactive waste facility and the NEF will be addressed as part of the licensing process for the WCS facility.

SECTION 6 – ENVIRONMENTAL MEASUREMENTS AND MONITORING PROGRAMS

Pursuant to 10 CFR Part 20, licensees are required to conduct surveys to demonstrate compliance and that radioactive material in effluent discharges are kept as low as reasonably achievable.

6-1 Water Resources:

A. Discuss the reason for the lack of any radiological or chemical sampling of the septic tank and leach field in Section 6.1.2.

B. If such monitoring is planned, provide information on the program.

C. Provide the locations of all groundwater sampling wells on Figure 6.1-2.

- Figure 6.1-2 legend indicates that groundwater samples would be taken at two locations to be determined at a later date. Groundwater would be sampled for radionuclides, metals, organics and pesticides. No rationale is provided for where the groundwater wells that would be necessary to take the samples would be located in orientation to the proposed NEF and to each other.

D. Clarify which of these wells would act as a background well and which aquifer is being sampled.

E. Clarify whether background monitoring well location would consider and avoid potential cross contamination from WCS and other surrounding industrial activities.

F. Describe the discharges that would occur from the outfall of the site stormwater detention basin (Item 7 on Figure 6.1-1).

G. Describe the water quality features of the discharges, the surface feature receiving the discharge from this outfall, and any impacts on the highway or surrounding facilities (e.g., Lea County Landfill).

H. Provide a discussion on any impacts of discharges from the outfall of the diversion ditch and associated mitigative measures (Item 5 on Figure 6.1-1).

I. Justify why the lower limits of detection (LLD) shown in Table 6.2-1 are higher than EPA action limits for some of the proposed analyses.

- Table 6.2-1 shows the LLD for metals to be 5 parts per million (ppm) whereas the EPA limit for lead is 0.5 ppm.

J. Describe how the surface water testing program complies with the State of New Mexico Standards for Interstate and Intrastate Surface Waters.

LES Response

A. The septic systems will receive only typical sanitary wastes. No plant process related effluents will be introduced into the septic systems. Each septic tank will, however, be

periodically sampled (prior to pumping) and analyzed for isotopic Uranium. The septic tanks are upstream of the leachfields. Any Uranium that is in the system that could reach the leachfields would be detected in the septic tanks. Therefore, no sampling will be performed at the leachfields. No chemical sampling of the septic systems is planned because no plant process related effluents will be introduced into the septic system.

B. The septic tank monitoring described in RAI 6-1A will be included in the site environmental monitoring program.

C. The locations of the groundwater sampling (monitoring) wells are shown on Figure ER RAI 6-1C, "Groundwater Monitoring Well Locations," in Attachment 3 to this submittal. The rationale for the locations is based on the slope of the red bed surface at the base of the shallow sand and gravel layer and the groundwater gradient in the 70 m (230 ft) groundwater zone to the south under the NEF site and proximity to key site structures. Two monitoring wells will be located down-gradient of the site basins, two will be located down-gradient of the UBC Storage Pad and one will be located up-gradient of the UBC Storage Pad and all site facilities.

D. The background monitoring well, MW-1, is shown on Figure ER RAI 6-1C. Monitoring at this location will occur in both the shallow sand and gravel layer on top of the red bed and in the 70-m (230-ft) groundwater zone. Groundwater in the sand and gravel layer was not encountered at the NEF site during groundwater investigations. Although not an aquifer, it will be monitored since it is the shallowest layer under the NEF site. The 70-m (230-ft) zone contains the first occurrence of groundwater beneath the NEF. Although not strictly meeting the definition of an aquifer, which requires that the unit be able to transmit "significant quantities of water under ordinary hydraulic gradients," this layer will also be monitored.

E. The background monitoring well, MW-1, is located on the NEF property, up-gradient of the NEF and cross-gradient from the WCS facility. This location is intended to avoid potential contamination from both facilities, i.e., NEF and/or WCS.

With respect to other surrounding industrial activities, the Wallach Quarry and the Sundance Services "produced water" lagoons north of the NEF site have some potential to introduce contaminants that could reach MW-1. The contaminants of concern for those facilities should be readily differentiated from potential contaminants from the NEF.

F. The normal discharge from the basin will be through evaporation and infiltration into the ground. During high precipitation runoff events, some discharge may occur from the outfall. The basin and outfall are designed to discharge post-construction peak flow runoff rates from the outfall during these high runoff events that are equal to or less than the pre-construction runoff rates from the site area.

G. The water quality of the discharge will be typical of runoff from building roofs and paved areas from any industrial facility. Except for small amounts of oil and grease typically found in runoff from paved roadways and parking areas, the discharge is not expected to contain contaminants. The surface feature receiving the discharge is the north side of New Mexico Route 234. Several culverts presently exist under the road that transmit runoff to the south side of the road. Since post-construction flows will not increase over pre-construction flows, there will be no additional impact on the highway or surrounding facilities.

H. The purpose of the diversion ditch is to safely divert surface runoff from the area upstream of the NEF around the east and west sides of the NEF structures during extreme precipitation events. There is no retention or attenuation of flow associated with this feature. The east side will divert surface runoff into the Site Stormwater Detention Basin. The basin is designed to provide no flow attenuation for this component of flow. The west side will divert surface runoff around the site where it will continue on as overland flow. Since there are no modifications or attenuation of flows, there are no adverse impacts and no mitigative measures are required.

I. In the next revision to the ER, Table 6.2-1 will be revised to reflect that the lower limits of detection (LLD) for all analyses listed in Table 6.2-1 will meet the applicable EPA limits.

J. The basins at the NEF do not meet the definition of "surface water" in the State of New Mexico. Waste water treatment systems, treatment ponds or lagoons are not surface waters of the State, unless they were originally constructed in waters of the State or resulted in the impoundment in surface waters of the State. State of New Mexico Standards for Interstate and Intrastate Surface Waters provide an anti-degradation policy applicable to defined surface waters and are not applicable to the NEF surface water testing program, because the basins do not meet the definition of "surface waters" in the State of New Mexico. In addition, as determined by the US Army Corps of Engineers, there are no jurisdictional surface waters in the area (See the response for RAI 1-1A).

SECTION 7 – COST/BENEFIT ANALYSIS

Pursuant to 10 CFR 51.45(c), the ER is required to consider the economical, technical, and other benefits and costs of the proposed action and alternatives.

7-1 A. Provide a description of jobs to be generated during operation of the proposed NEF. Information should include:

1.) Number of jobs by job type (laborers, janitors, guards, engineers, mechanics, electricians, administrative staff, etc.), and
2.) Estimated hourly or monthly wages for each job type during the 30 years of operation.
3.) Anticipated educational or training requirements for job types.

B. Provide detailed information on the yearly itemized purchases for labor, equipment, and materials in Section 7.2.1. Information should include:

1.) Anticipated yearly purchases of steel, concrete, and related construction materials, and
2.) Anticipated percentage of construction materials to be purchased locally each year.

C. Discuss whether or not LES plans to apply for inclusion in a Foreign Trade Zone or apply for a sub-zone around the proposed NEF.

LES Response

A. Section 7.1 of the ER summarizes the results of the cost benefit analysis of the construction and operation of the NEF. Employment opportunities will range from plant operations, maintenance and health physics positions to clerical and security-related jobs.

LES plans to provide extensive training for employees, and approximately 20% of employment opportunities will involve an advanced understanding of the NEF. These employment opportunities will require an educated workforce. The professional/management staff will comprise a mixture of associate, bachelor or master degree level personnel. A high school diploma is the minimum requirement for skilled and administrative staff.

Training will be provided by LES in partnership with local institutions such as New Mexico Junior College.

The types of jobs, numbers of jobs, wages, and training and education requirements are summarized in Table ER RAI 7-1A.1, "Descriptions of Job Types During Operation," in Attachment 2 to this submittal.

B. The following information will be incorporated in Section 7.2.1 in the next revision to the ER. The initial construction period for NEF is approximately three years. This period will encompass site preparation and construction of most site structures. Due to the phased installation of centrifuge equipment, production will commence prior to completion of the initial three-year construction period. The manpower and materials used during this phase of the project will vary depending on the construction plan. Table ER RAI 7-1B.1,

"Estimated Construction Material Yearly Purchases," provides the estimated total quantities of purchased construction materials and Table ER RAI 7-1B.2, "Estimated Yearly Labor Costs for Construction," provides the estimated labor that will be required to install these materials. Both tables are provided in Attachment 2 to this submittal. The scheduling of materials and labor expenditures is subject to the provisions of the project construction execution plan, which has not yet been developed.

Approximately 60 to 80% of the construction materials will be purchased from the local NEF site area. According to the labor survey conducted as part of the conceptual estimate, the major portion of the required craft labor forces will come from the five or six counties around the project area, including the nearby Texas counties.

C. LES is interested in applying for inclusion in a Free Trade Zone, but is not preparing an application at this time.

ATTACHMENT 2

Louisiana Energy Services
Response to April 29, 2004,
Request for Additional Information

Tables Referenced from Responses

Table ER RAI 2-4A.1 Production for Nominal 30 Years of Operation[1]

Year	UBC per Year	UBC Cumulative
1	66	66
2	196	262
3	313	575
4	431	1,006
5	548	1,554
6	623	2,177
7	627	2,804
8	627	3,431
9	627	4,058
10	627	4,685
11	627	5,312
12	627	5,939
13	627	6,566
14	627	7,193
15	627	7,820
16	627	8,447
17	627	9,074
18	627	9,701
19	627	10,328
20	627	10,955
21	627	11,582
22	627	12,209
23	627	12,836
24	627	13,463
25	627	14,090
26	561	14,651
27	444	15,095
28	326	15,421
29	209	15,630
30	92	15,722
31	5	15,727
32	0	15,727

Note:

1. Conservative upper bound scenario with respect to UBC Storage Pad dose calculations, UBC Storage Pad sizing, and the decommissioning funding estimate.

Table ER RAI 2-4A.2 Production During 30-Year License Period [1]

Year	UBC per Year	UBC Cumulative
1	66	66
2	196	262
3	313	575
4	431	1,006
5	548	1,554
6	623	2,177
7	627	2,804
8	627	3,431
9	627	4,058
10	627	4,685
11	627	5,312
12	627	5,939
13	627	6,566
14	627	7,193
15	627	7,820
16	627	8,447
17	627	9,074
18	627	9,701
19	627	10,328
20	627	10,955
21	561	11,516
22	444	11,960
23	326	12,286
24	209	12,495
25	92	12,587
26	5	12,592
27	0	12,592
28	0	12,592
29	0	12,592
30	0	12,592

Note:

1 Plant production consistent with the 30-year license period (which includes the scheduled time period for decommissioning).

Table ER RAI 2-6.1 Commodities Used, Consumed, or Stored at the NEF During Construction

Item Description	Quantity
Architectural Finishes, All Areas	77,588 m^2 (835,153 ft^2)
Asphalt Paving	79,767 m^2 (95,400 yd^2)
Chain Link Fence	15,011 m (49,250 ft)
Concrete (including embedded items)	59,196 m^3 (77,425 yd^3)
Concrete Paving	1,765 m^2 (2,111 yd^2)
Copper and Aluminum Wiring	361,898 m (1,187,328 ft)
Crushed Stone	287,544 m^2 (343,900 yd^2)
Electrical Conduit	120,633 m (395,776 ft)
Fence Gates	14 each
HVAC Units	109 each
Permanent Metal Structures	2 each
Piping (Carbon & Stainless Steel)	55,656 m (182,597 ft)
Roofing Materials	52,074 m^2 (560,515 ft^2)
Stainless & Carbon Steel Ductwork	515,125 kg (1,135,657 lbs)
Temporary Metal Structures	2 each

Table removed under 10 CFR 2.390.

Table ER RAI 3-1A.1 NEF Site Soil Sample Locations

Soil Sample No.	Location Description	Latitude	Longitude
SS-2	Uranium Byproduct Cylinders (UBC) Storage Pad	32° 26' 18"	103° 04' 53"
SS-6	Cascade Halls 3&4	32° 26' 06"	103° 04' 45"
SS-9	Treated Effluent Evaporative Basin	32° 26' 02"	103° 04' 55"
SS-11	Technical Services Building	32° 26' 02"	103° 04' 47"
SS-12	UBC Storage Pad Stormwater Retention Basin	32° 25' 59"	103° 05' 03"
SS-13	Site Stormwater Detention Basin	32° 25' 51"	103° 04' 37"
SS-15	Northwest quadrant	32° 26' 28"	103° 05' 11"
SS-16	Northeast quadrant	32° 26' 28"	103° 04' 33"

Notes:

Refer to Figure ER RAI 3-1A for the approximate locations of the soil samples on the NEF site.

Table ER RAI 3-1A.2 Radiological Chemical Analyses of NEF Site Soil

Analytical Results Bq/kg (pCi/kg)									Comparative Soil Concentration Bq/kg (pCi/kg) (From ER Section 3.11.1.1)
Sample No.	SS-2	SS-6	SS-9	SS-11	SS-12	SS-13	SS-15	SS-16	
Nuclide[1]									
AcTh-228	6.7 (181)	5.6 (151)	6.2 (168)	6.5 (175)	7.6 (205)	6.4 (172)	5.8 (156)	7.4 (201)	8.1 (218)[2]
Cs-137	4.3 (115.5)	3 (80.7)	3.1 (84)	3.1 (83.5)	2.1 (57.6)	1.2 (32.6)	2.7 (74)	3.3 (89.9)	2.82 (76.3)[3]
K-40	137.8 (3720)	140 (3780)	135.2 (3650)	138.9 (3750)	133.7 (3610)	135.6 (3660)	143 (3860)	139.6 (3770)	130 (3,500)[2]
Th-228	5.4 (146)	7.7 (207)	5.7 (154)	6.5 (175)	7.7 (207)	7.4 (199)	7.8 (211)	7.4 (200)	8.1 (218)[2]
Th-230	5.8 (157)	5.0 (136)	5.9 (160)	5.7 (155)	6 (163)	5.5 (149)	6 (161)	6.8 (183)	NA[4]
Th-232	7.6 (204)	6 (163)	6.1 (164)	6.7 (181)	7.3 (196)	7.2 (194)	7.7 (207)	7 (188)	8.1 (218)[2]
U-234	5.9 (159.2)	6.1 (165)	6.2 (168.4)	6.1 (165.4)	5.9 (159.4)	5.3 (143)	6.0 (161.5)	6.1 (165.4)	12 (333)[2]
U-235	0.24 (6.6)	0.25 (6.7)	0.39 (10.6)	0.43 (11.6)	0.41 (11.1)	0.36 (9.7)	0.28 (7.5)	0.24 (6.4)	NA[4]
U-238	5.4 (146.8)	5.9 (158)	6 (161.2)	6.2 (168.5)	6 (162.5)	5.8 (157.6)	5.8 (156.4)	5.7 (152.8)	12 (333)[2]

Notes:

1. No other nuclides were detected above their laboratory measured MDC.
2. Typical lower end range value.
3. Average in NEF site soils. Credited to past weapons testing fallout.
4. Typical soil concentration data is not available.

Table ER RAI 3-1A.3 Non-Radiological Chemical Analyses of NEF Site Soil

Analytical Results (mg/kg)									New Mexico Soil Screening Level (mg/kg)[1]
Sample No.	SS-2	SS-6	SS-9	SS-11	SS-12	SS-13	SS-15	SS-16	
Parameter [2],[3]									
Barium	22	15	53	19	19	16	17	24	1,440
Chromium	5.9	3.1	3.4	3.4	3.5	3	3.1	3.7	180
Lead	2.8	2.2	3.3	2.8	2.7	2.6	2.5	2.9	400

Notes:

1. Source: Technical Background Document for Development of Soil Screening Levels (Revision 2, February 2004), New Mexico Environment Department (NMED) Hazardous Waste Bureau, Ground Water Quality Bureau and Voluntary Remediation Program. The most conservative soil screening level is listed from the levels indicated for residential, industrial/occupational and construction worker exposures. For chromium, the soil screening level for Chromium VI is listed since it controls over that for Chromium III.

2. Other parameters analyzed (volatiles, semi-volatiles, metals (arsenic, cadmium, mercury, selenium, silver and mercury), organochlorine pesticides, organophosphorous compounds, chlorinated herbicides and fluoride) were not detected above the laboratory reporting limits.

3. Analytical methods were performed in accordance with Environmental Protection Agency (EPA) publication SW846, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," Third Edition, November 1986, and Updates I, II, IIA, IIB, III, and IIIA.

Table ER RAI 3-1C.1 Geological Units Exposed At, Near, or Underlying the Site

Formation	Geologic Age	Descriptions	Estimates for the NEF Site Area[1]	
			Depths: m (ft)	Thickness: m (ft)
Topsoils	Recent	Silty fine sand with some fine roots - eolian	Range: 0 to 0.6 (0 to 2) Average: 0 to 0.4 (0 to 1.4)	Range: 0.3 to 0.6 (1 to 2) Average: 0.4 (1.4)
Mescalero Sands/ Blackwater Draw Formation	Quaternary	Dune or dune-related sands	Range (sporadic across site): 0 to 3 (0 to 10) Average: NA[4]	Range (sporadic across site): 0 to 3 (0 to 10) Average: NA[5]
Gatuña/ Antlers Formation	Pleistocene/ mid-Pliocene	Pecos Valley alluvium: Sand and silty sand with interbedded caliche near the surface and a sand and gravel base layer	Range: 0.3 to 17 (1 to 55) Average: 0.4 to 12 (1.4 to 39)	Range: 6.7 to 16 (22 to 54) Average: 12 (38)
Mescalero Caliche	Quaternary	Soft to hard calcium carbonate deposits	Range: 1.8 to 12 (6 to 38) Average: 3.7 to 8 (12 to 26)	Range: 0 to 6 (0 to 20) Average (all 14 borings)[2]: 1.4 (5) Average (five borings that encountered caliche): 4.3 (14)
Chinle Formation	Triassic	Claystone and silty clay: red beds	Range: 7 to 340 (23 to 1,115) Average: 12 to 340 (39 to 1,115)	Range: 323 to 333 (1,060 to 1,092) Average: 328 (1,076)
Santa Rosa Formation	Triassic	Sandy red beds, conglomerates and shales	Range: 340 to 434 (1,115 to 1,425) Average: NA[4]	Range: NA[3] Average: 94 (310)
Dewey Lake	Permian	Muddy sandstone and shale red beds	Range: 434 to 480 (1,425 to 1,575) Average: NA[4]	Range: NA[3] Average: 46 (150)

Notes:

1. Range of depths is below ground level to shallowest top and deepest bottom of geological unit determined from site boring logs, unless noted.

   Average depths are below ground level to average top and average bottom of geological unit determined from site boring logs, unless noted.

   Range of thickness is from the smallest thickness to the largest thickness of geological unit determined from site boring logs, unless noted.

   Average thickness is the average as determined from site boring logs, unless noted.

   Bottom of Chinle Formation, top and bottom of Santa Rosa Formation and top and bottom of Dewey Lake Formation are single values from a deep boring just south of the NEF.

2. Caliche is not present at some locations of the site. Where not present in a particular boring, a thickness of '0' m (ft) was used in calculating the average.
3. Range of thickness is not available.
4. Average depths are not available.
5. Average thickness is not available.

Table ER RAI 3-3.1 Wind Frequency Distribution

	WCS Data		Midland-Odessa Data	
Compass Sector	Hours	Percent Frequency	Hours	Percent Frequency
North (N)	549	3.2	2388	5.6
North-Northeast (NNE)	788	4.5	1692	4.0
Northeast (NE)	1005	5.8	2103	4.9
East-Northeast (ENE)	1031	5.9	2094	4.9
East (E)	1158	6.7	2691	6.3
East-Southeast (ESE)	1071	6.2	2366	5.5
Southeast (SE)	1902	11.0	3237	7.6
South-Southeast (SSE)	2327	13.4	4648	10.9
South (S)	2038	11.8	8784	20.6
South-Southwest (SSW)	1280	7.4	3136	7.3
Southwest (SW)	990	5.7	2345	5.5
West-Southwest (WSW)	779	4.5	1997	4.7
West (W)	768	4.4	1887	4.4
West-Northwest (WNW)	624	3.6	997	2.3
Northwest (NW)	609	3.5	1104	2.6
North-Northwest (NNW)	417	2.4	1272	3.0
Total	17336	100	42741	100.1[1]

Note:

1. Note that the percent frequency total is greater than 100% due to round off.

Table ER RAI 3-5.1 Estimated Tax Revenue

Tax	Estimated Payments Over the Life of the Plant	
	Low Estimate	High Estimate
Gross Receipts	$23,000,000	$34,000,000
NM Corporate Income Tax [1]	$120,000,000	$140,000,000
Corporate Franchise Tax	$1,000	$1,000
NM Withholding Tax	$15,000,000	$15,000,000
NM Unemployment Insurance	$9,000,000	$9,000,000
NM Property Tax [2]	$10,000,000	$14,000,000
Total	$177,001,000	$212,001,000

Notes:

1. Based on average income.
2. Average.

Table ER RAI 3-5.2 Estimated Tax Revenue Allocations [1] [2]

Tax	State of New Mexico	Lea County	Eunice, NM	Total
Estimated Gross Receipts Tax				
High	$32,300,000	$1,700,000	NA [3]	$34,000,000
Low	$21,850,000	$1,150,000	NA [3]	$23,000,000
NM Corporate Income Tax [4]				
Estimated total payments over life of the plant				
High	$140,000,000	NA [5]	NA [5]	$140,000,000
Low	$120,000,000	NA [5]	NA [5]	$120,000,000
NM Corporate Franchise Tax [6]				
Estimated total payments over life of the plant	$1,000	--	--	$1,000
NM Withholding Tax				
Estimated total payments over the life of the plant	$15,000,000	NA [5]	NA [5]	$15,000,000
NM Unemployment Insurance				
Estimated total payments over the life of the plant	$9,000,000	NA [5]	NA [5]	$9,000,000
NM Property Tax [7]				
High (Estimated total payments over the life of the plant)	--	$14,000,000	NA [3]	$14,000,000
Low (Estimated total payments over the life of the plant)	--	$10,000,000	NA [3]	$10,000,000

Notes:

1. Inflation is not included in any estimate.
2. Tax rates are based on tax rates as of April 2004.
3. Allocation to Eunice, NM will be performed by Lea County. Allocation estimate is not available.
4. Based on average earnings over the life of the plant.
5. Allocation will be made by the State of New Mexico. Allocation estimate is not available.
6. Based on $50 per year flat rate.
7. Property tax is dependent on sustaining investment in the plant.

Table ER RAI 4-2A.1a Water Balance for Treated Effluent Evaporative Basin
(Minimum Scenario)

Month	Precipitation cm (in)	Total Precipitation Inflow to Basin m^3 (gal)	Treated Effluent Inflow to Basin m^3 (gal)	Total Inflow to Basin m^3 (gal)	Evaporation per Month cm (in)	Potential Evaporation Outflow from Basin m^3 (gal)	Balance Inflow – Outflow m^3 (gal)	Net In Basin m^3 (gal)
JAN	0.5 (0.2)	40 (10,508)	211 (55,824)	251 (66,332)	4.2 (1.7)	128 (33,694)	124 (32,638)	124 (32,638)
FEB	0.7 (0.3)	56 (14,711)	211 (55,824)	267 (70,535)	10.1 (4.0)	307 (81,069)	-40 (-10,534)	84 (22,104)
MAR	0.5 (0.2)	40 (10,508)	211 (55,824)	251 (66,332)	22.4 (8.8)	679 (179,292)	-428 (-112,96)	0 (0)
APR	0.8 (0.3)	64 (16,813)	211 (55,824)	275 (72,636)	28.0 (11.0)	850 (224,625)	-575 (-151,989)	0 (0)
MAY	2.6 (1.0)	207 (54,641)	211 (55,824)	418 (110,465)	24.5 (9.6)	743 (196,241)	-325 (-85,775)	0 (0)
JUN	2.0 (0.8)	159 (42,032)	211 (55,824)	370 (97,856)	23.4 (9.2)	710 (187,664)	-340 (-89,808)	0 (0)
JUL	2.4 (0.9)	191 (50,438)	211 (55,824)	402 (106,262)	22.1 (8.7)	670 (177,045)	-268 (-70,783)	0 (0)
AUG	2.5 (1.0)	199 (52,540)	211 (55,824)	410 (108,364)	20.7 (8.2)	628 (166,018)	-218 (-57,655)	0 (0)
SEP	3.0 (1.2)	247 (65,149)	211 (55,824)	458 (120,973)	19.9 (7.8)	604 (159,688)	-147 (-38,715)	0 (0)
OCT	1.4 (0.5)	111 (29,422)	211 (55,824)	323 (85,246)	12.2 (4.8)	371 (98,018)	-48 (-12,772)	0 (0)
NOV	0.9 (0.3)	72 (18,914)	211 (55,824)	283 (74,738)	8.8 (3.5)	267 (70,655)	15 (4,083)	15 (4,083)
DEC	0.7 (0.3)	56 (14,711)	211 (55,824)	267 (70,535)	6.9 (2.7)	209 (55,135)	58 (15,400)	74 (19,483)
Totals	17.8 (7.0)	1,440 (380,389)	2,536 (669,884)	3,975 (1,050,273)	203.2 (80.0)	6,167 (1,629,144)		

Table ER RAI 4-2A.1b Water Balance for Treated Effluent Evaporative Basin (Maximum Scenario)

Month	Precipitation cm (in)	Total Precipitation Inflow to Basin m^3 (gal)	Treated Effluent Inflow to Basin m^3 (gal)	Total Inflow to Basin m^3 (gal)	Evaporation per Month cm (in)	Potential Evaporation Outflow from Basin m^3 (gal)	Balance Inflow – Outflow m^3 (gal)	Net In Basin m^3 (gal)
JAN	2.0 (0.8)	163 (43,174)	211 (55,824)	375 (98,998)	4.2 (1.7)	128 (33,694)	247 (65,304)	247 (65,304)
FEB	2.8 (1.1)	229 (60,444)	211 (55,824)	440 (116,268)	10.1 (4.0)	307 (81,069)	133 (35,199)	380 (100,503)
MAR	2.0 (0.8)	163 (43,174)	211 (55,824)	375 (98,998)	22.4 (8.8)	679 (179,292)	-304 (-80,294)	76 (20,209)
APR	3.2 (1.3)	261 (69,079)	211 (55,824)	473 (124,903)	28.0 (11.0)	850 (224,625)	-377 (-99,722)	0 (0)
MAY	10.5 (4.1)	850 (224,507)	211 (55,824)	1,061 (280,331)	24.5 (9.6)	743 (196,241)	318 (84,090)	318 (84,090)
JUN	8.1 (3.2)	654 (172,698)	211 (55,824)	865 (228,521)	23.4 (9.2)	710 (187,664)	155 (40,857)	473 (124,947)
JUL	9.7 (3.8)	784 (207,237)	211 (55,824)	996 (263,061)	22.1 (8.7)	670 (177,045)	326 (86,016)	799 (210,963)
AUG	10.1 (4.0)	817 (215,872)	211 (55,824)	1,028 (271,696)	20.7 (8.2)	628 (166,018)	400 (105,677)	1,199 (316,640)
SEP	12.5 (4.9)	1,013 (267,681)	211 (55,824)	1,225 (323,505)	19.9 (7.8)	604 (159,688)	620 (163,817)	1,819 (480,458)
OCT	5.7 (2.2)	458 (120,888)	211 (55,824)	669 (176,712)	12.2 (4.8)	371 (98,018)	298 (78,694)	2,116 (559,151)
NOV	3.6 (1.4)	294 (77,714)	211 (55,824)	505 (133,538)	8.8 (3.5)	267 (70,655)	238 (62,883)	2,354 (622,034)
DEC	2.8 (1.1)	229 (60,444)	211 (55,824)	440 (116,268)	6.9 (2.7)	209 (55,135)	231 (61,133)	2,586 (683,167)
Totals	73.1 (28.8)	5,916 (1,562,914)	2,536 (669,884)	8,451 (2,232,798)	203.2 (80.0)	6,167 (1,629,144)		

Table ER RAI 4-2A.2a Water Balance for UBC Storage Pad Stormwater Retention Basin (Minimum Scenario)

Month	Precipitation cm (in)	Total Precipitation Inflow to Basin m^3 (gal)	Blowdown Inflow to Basin m^3 (gal)	Total Inflow to Basin m^3 (gal)	Evaporation per Month cm (in)	Potential Evaporation Outflow from Basin m^3 (gal)	Balance Inflow – Outflow m^3 (gal)	Net in Basin m^3 (gal)
JAN	0.5 (0.2)	398 (105,080)	1,604 (423,875)	2,002 (528,955)	4.2 (1.7)	3,061 (808,650)	-1,059 (-279,695)	0 (0)
FEB	0.7 (0.3)	557 (147,112)	1,604 (423,875)	2,161 (570,987)	10.1 (4.0)	7,365 (1,945,661)	-5,203 (-1,374,674)	0 (0)
MAR	0.5 (0.2)	398 (105,080)	1,604 (423,875)	2,002 (528,955)	22.4 (8.8)	16,287 (4,302,999)	-14,285 (-3,774,044)	0 (0)
APR	0.8 (0.3)	636 (168,128)	1,604 (423,875)	2,241 (592,003)	28.0 (11.0)	20,406 (5,391,000)	-18,165 (-4,798,998)	0 (0)
MAY	2.6 (1.0)	2,068 (546,415)	1,604 (423,875)	3,673 (970,290)	24.5 (9.6)	17,827 (4,709,774)	-14,154 (-3,739,484)	0 (0)
JUN	2.0 (0.8)	1,591 (420,319)	1,604 (423,875)	3,195 (844,194)	23.4 (9.2)	17,048 (4,503,936)	-13,853 (-3,659,742)	0 (0)
JUL	2.4 (0.9)	1,909 (504,383	1,604 (423,875)	3,514 (928,258)	22.1 (8.7)	16,083 (4,249,089)	-12,570 (-3,320,831)	0 (0)
AUG	2.5 (1.0)	1,989 (525,399)	1,604 (423,875)	3,593 (949,274)	20.7 (8.2)	15,082 (3,984,439	-11,488 (-3,035,165)	0 (0)
SEP	3.0 (1.2)	2,466 (651,495)	1,604 (423,875)	4,070 (1,075,370)	19.9 (7.8)	14,507 (3,832,511)	-10,436 (-2,757,142)	0 (0)
OCT	1.4 (0.5)	1,114 (294,223)	1,604 (423,875)	2,718 (718,098)	12.2 (4.8)	8,904 (2,352,437)	-6,186 (-1,634,338)	0 (0)
NOV	0.9 (0.3)	716 (189,144)	1,604 (423,875)	2,320 (613,019)	8.8 (3.5)	6,418 (1,695,715)	-4,098 (-1,082,696)	0 (0)
DEC	0.7 (0.3)	557 (147,112)	1,604 (423,875)	2,161 (570,987)	6.9 (2.7)	5,009 (1,323,246)	-2,847 (-752,259)	0 (0)
Totals	17.8 (7.0)	14,398 (3,803,888)	19,253 (5,086,500)	33,651 (8,890,388)	203.2 (80.0)	147,996 (39,099,456)		

Table ER RAI 4-2A.2b Water Balance for UBC Storage Pad Stormwater Retention Basin (Maximum Scenario)

Month	Precipitation cm (in)	Total Precipitation Inflow to Basin m^3 (gal)	Blowdown Inflow to Basin m^3 (gal)	Total Inflow to Basin m^3 (gal)	Evaporation per Month cm (in)	Potential Evaporation Outflow from Basin m^3 (gal)	Balance Inflow – Outflow m^3 (gal)	Net in Basin m^3 (gal)
JAN	2.0 (0.8)	1,634 (431,723)	1,604 (423,875)	3,239 (855,598)	4.2 (1.7)	3,061 (808,650)	178 (46,948)	178 (46,948)
FEB	2.8 (1.1)	2,288 (604,412)	1,604 (423,875)	3,892 (1,028,287)	10.1 (4.0)	7,365 (1,945,661)	-3,472 (-917,374)	0 (0)
MAR	2.0 (0.8)	1,634 (431,723)	1,604 (423,875)	3,239 (855,598)	22.4 (8.8)	16,287 (4,302,999)	-13,049 (-3,447,400)	0 (0)
APR	3.2 (1.3)	2,615 (690,757)	1,604 (423,875)	4,219 (1,114,632)	28.0 (11.0)	20,406 (5,391,000)	-16,187 (-4,276,368)	0 (0)
MAY	10.5 (4.1)	8,497 (2,244,960)	1,604 (423,875)	10,102 (2,668,835)	24.5 (9.6)	17,827 (4,709,774)	-7,725 (-2,040,939)	0 (0)
JUN	8.1 (3.2)	6,536 (1,726,893)	1,604 (423,875)	8,141 (2,150,768)	23.4 (9.2)	17,048 (4,503,936)	-8,907 (-2,353,168)	0 (0)
JUL	9.7 (3.8)	7,844 (2,072,271)	1,604 (423,875)	9,448 (2,496,146)	22.1 (8.7)	16,083 (4,249,089)	-6,635 (-1,752,942)	0 (0)
AUG	10.1 (4.0)	8,171 (2,158,616)	1,604 (423,875)	9,775 (2,582,491)	20.7 (8.2)	15,082 (3,984,439)	-5,307 (-1,401,949)	0 (0)
SEP	12.5 (4.9)	10,132 (2,676,684)	1,604 (423,875)	11,736 (3,100,559)	19.9 (7.8)	14,507 (3,832,511)	-2,771 (-731,953)	0 (0)
OCT	5.7 (2.2)	4,576 (1,208,825)	1,604 (423,875)	6,180 (1,632,700)	12.2 (4.8)	8,904 (2,352,437)	-2,724 (-719,737)	0 (0)
NOV	3.6 (1.4)	2,941 (777,102)	1,604 (423,875)	4,546 (1,200,977)	8.8 (3.5)	6,418 (1,695,715)	-1,873 (-494,738)	0 (0)
DEC	2.8 (1.1)	2,288 (604,412)	1,604 (423,875)	3,892 (1,028,287)	6.9 (2.7)	5,009 (1,323,246)	-1,116 (-294,958)	0 (0)
Totals	73.1 (28.8)	59,155 (15,628,378)	19,253 (5,086,500)	78,408 (20,714,878)	203.2 (80.0)	147,996 (39,099,456)		

Table ER RAI 4-2A.3a Water Balance for the Site Stormwater Detention Basin (Minimum Scenario)

Month	Precipitation cm (in)	Total Precipitation Inflow to Basin m^3 (gal)	Evaporation + Infiltration per Month cm (in)	Potential Evaporation Outflow from Basin m^3 (gal)	Balance Inflow – Outflow m^3 (gal)	Net in Basin m^3 (gal)
JAN	0.5 (0.2)	2,376 (627,763)	65.2 (25.7)	47,460 (12,538,487)	-45,084 (-11,910,723)	0 (0)
FEB	0.8 (0.3)	3,564 (941,645)	71.1 (28.0)	51,763 (13,675,498)	-48,199 (-12,733,853)	0 (0)
MAR	0.5 (0.2)	2,376 (627,763)	83.3 (32.8)	60,686 (16,032,835)	-58,310 (-15,405,072)	0 (0)
APR	0.8 (0.3)	3,564 (941,645)	89.0 (35.0)	64,804 (17,120,837)	-61,240 (-16,179,192)	0 (0)
MAY	2.5 (1.0)	11,881 (3,138,817)	85.4 (33.6)	62,226 (16,439,611)	-50,345 (-13,300,793)	0 (0)
JUN	2.0 (0.8)	9,505 (2,511,054)	84.4 (33.2)	61,447 (16,233,773)	-51,942 (-13,722,719)	0 (0)
JUL	2.3 (0.9)	10,693 (2,824,936)	83.0 (32.7)	60,482 (15,978,925)	-49,789 (-13,153,990)	0 (0)
AUG	2.5 (1.0)	11,881 (3,138,817)	81.7 (32.2)	59,480 (15,714,276)	-47,600 (-12,575,459)	0 (0)
SEP	3.0 (1.2)	14,257 (3,766,581)	80.9 (31.8)	58,905 (15,562,348)	-44,648 (-11,795,767)	0 (0)
OCT	1.3 (0.5)	5,940 (1,569,409)	73.2 (28.8)	53,303 (14,082,273)	-47,363 (-12,512,865)	0 (0)
NOV	0.8 (0.3)	3,564 (941,645)	69.8 (27.5	50,817 (13,425,551)	-47,253 (-12,483,906)	0 (0)
DEC	0.8 (0.3)	3,564 (941,645)	67.8 (26.7)	49,407 (13,053,082)	-45,843 (-12,111,437)	0 (0)
Totals	17.8 (7.0)	83,166 (21,971,722)	934.7 (368.0)	680,782 (179,857,498)		

Table ER RAI 4-2A.3b Water Balance for the Site Stormwater Detention Basin (Maximum Scenario)

Month	Precipitation cm (in)	Total Precipitation Inflow to Basin m^3 (gal)	Evaporation + Infiltration per Month cm (in)	Potential Evaporation Outflow from Basin m^3 (gal)	Balance Inflow – Outflow m^3 (gal)	Net in Basin m^3 (gal)
JAN	2.0 (0.8)	9,445 (2,495,360)	65.2 (25.7)	47,460 (12,538,487)	-38,014 (-10,043,127)	0 (0)
FEB	2.8 (1.1)	13,223 (3,493,504)	71.1 (28.0)	51,763 (13,675,498)	-38,540 (-10,181,994)	0 (0)
MAR	2.0 (0.8)	9,445 (2,495,360)	83.3 (32.8)	60,686 (16,032,835)	-51,241 (-13,537,475)	0 (0)
APR	3.2 (1.3)	15,112 (3,992,576)	89.0 (35.0)	64,804 (17,120,837)	-49,692 (-13,128,261)	0 (0)
MAY	10.5 (4.1)	49,115 (12,975,871)	85.4 (33.6)	62,226 (16,439,611)	-13,111 (-3,463,740)	0 (0)
JUN	8.1 (3.2)	37,781 (9,981,439)	84.4 (33.2)	61,447 (16,233,773)	-23,666 (-6,252,333)	0 (0)
JUL	9.7 (3.8)	45,337 (11,977,727)	83.0 (32.7)	60,482 (15,978,925)	-15,145 (-4,001,198)	0 (0)
AUG	10.1 (4.0)	47,226 (12,476,799)	81.7 (32.2)	59,480 (15,714,276)	-12,254 (-3,237,477)	0 (0)
SEP	12.5 (4.9)	58,560 (15,471,231)	80.9 (31.8)	58,905 (15,562,348)	-345 (-91,117)	0 (0)
OCT	5.7 (2.2)	26,447 (6,987,008)	73.2 (28.8)	53,303 (14,082,273)	-26,856 (-7,095,266)	0 (0)
NOV	3.6 (1.4)	17,001 (4,491,648)	69.8 (27.5)	50,817 (13,425,551)	-33,816 (-8,933,904)	0 (0)
DEC	2.8 (1.1)	13,223 (3,493,504)	67.8 (26.7)	49,407 (13,053,082)	-36,184 (-9,559,579)	0 (0)
Totals	73.1 (28.8)	341,918 (90,332,027)	934.7 (368.0)	680,782 (179,857,498)		

Table ER RAI 4-4D.1 Effluent Release Point Design Parameters

Release Point	Stack Exit Area m^2 (ft^2)	Exit Height meters (ft)	Building Height meters (ft)	Adjacent Building Height – meters (ft)	Exit Velocity m/sec (ft/min)	Exit Temperature
TSB GEVS[1]	0.29 (3.14)	13 (42.6)	10 (32.8)	10 (32.8)	18.3 (3,600)	Room temperature
SB GEVS[2]	0.13 (1.40)	13 (42.6)	10 (32.8)	10 (32.8)	23.4 (4,600)	Room temperature
CAB CT & PM[3]	0.13 (1.40)	15 (49.2)	12 (39.4)	12 (39.4)	20.3 (4,000)	Room temperature
TSB CVS[4]	0.29 (3.14)	13 (42.6)	10 (32.8)	10 (32.8)	20.3 (4,000)	Room temperature

Notes:

1. Technical Services Building Gaseous Effluent Vent System.
2. Separation Building Gaseous Effluent Vent System.
3. Centrifuge Assembly Building; Centrifuge Test and Post Mortem Facility.
4. Technical Services Building Confinement Ventilation System.

Table ER RAI 4-4D.2 Annual Effluent Releases (Equivalent to 10 g (0.022 lbs)Uranium)

Radionuclide	TSB GEVS kBq/yr (μCi/yr)	SB GEVS kBq/yr (μCi/yr)
U-234	77.7 (2.10)	45.5 (1.23)
U-235	3.59 (0.097)	2.11 (0.057)
U-236	0.48 (0.013)	0.30 (0.008)
U-238	77.7 (2.10)	45.5 (1.23)
Total	159.5 (4.31)	93.6 (2.53)

Table ER RAI 4-4E.1 Construction Emission Types

Emission Type	Source Location	Quantity
Fugitive Dust	On site	2.4 g/s (19.1 lb/hr) [1]
Vehicle Exhaust	On site	4,535 kg/yr (5 tons/yr) [2]
Portable Generator Exhaust	NA [3]	NA [3]
Paint Fumes	On site buildings	NA [3]
Welding Torch Fumes	On site buildings	NA [3]
Solvent Fumes	NA [3]	NA [3]
Boiler Exhaust	Central Utilities Building	5,007.6 kg/yr (5.52 ton/yr) of NOx, 499 kg/yr (0.55 ton/yr) of CO, 798 kg/yr (0.88 ton/yr) of VOC
Emergency Diesel Generator Exhaust	Central Utilities Building	99.9 kg/yr (0.11 ton/yr) of PM10, 11,094.9 kg/yr (12.23 ton/yr) of NOx, 852.8 kg/yr (0.94 ton/yr) of CO, 263.1 kg/yr (0.29 ton/yr) of VOC
Air Compressors	NA [3]	NA [3]

Notes:

1. From ER Table 4.6-1.
2. From ER Section 4.6.1.
3. Information is not available at this time.

Table ER RAI 4-4E.2 Decommissioning Emission Types

Emission Type[1]	Source Location	Quantity
Fugitive Dust	On site	2.4 g/s (19.1 lb/hr) [2]
Vehicle Exhaust	On site	4,535 kg/yr (5 tons/yr) [3]
Portable Generator Exhaust	NA [4]	NA [4]
Cutting Torch Fumes	On site buildings	NA [4]
Solvent Fumes	NA [4]	NA [4]
Boiler Exhaust	Central Utilities Building	5,007.6 kg/yr (5.52 ton/yr) of NOx, 499 kg/yr (0.55 ton/yr) of CO, 798 kg/yr (0.88 ton/yr) of VOC
Emergency Diesel Generator Exhaust	Central Utilities Building	99.9 kg/yr (0.11 ton/yr) of PM10, 11,094.9 kg/yr (12.23 ton/yr) of NOx, 852.8 kg/yr (0.94 ton/yr) of CO, 263.1 kg/yr (0.29 ton/yr) of VOC
Air Compressors	NA [4]	NA [4]

Notes:

1. Fugitive dust and vehicle exhaust during decommissioning are assumed to be bounded by the emissions during construction.
2. From ER Table 4.6-1.
3. From ER Section 4.6.1.
4. Information is not available at this time.

Table ER RAI 4-4F.1 Offsite Vehicle Air Emissions During Construction

Estimated Vehicle Type	Emission Factor (g/mi)	Estimated Daily Number of Vehicles	Estimated Daily Mileage km (mi)	Daily Work Day Emissions (g)
NONMETHANE HYDROCARBONS				
Light Duty Vehicles (Gasoline)	1.2	800	64.4 (40)	38,400
Heavy Duty Truck (Diesel)	2.1	14	322 (200)	5,880
Total				44,280
Daily Emissions				**4.4E-02 metric tons (4.9E-02 tons)**
CARBON MONOXIDE				
Light Duty Vehicles (Gasoline)	4.6	800	64.4 (40)	147,200
Heavy Duty Truck (Diesel)	10.2	14	322 (200)	28,560
Total				175,760
Daily Emissions				**1.8E-01 metric tons (2.0E-01 tons)**
NITROGEN OXIDES				
Light Duty Vehicles (Gasoline)	0.7	800	64.4 (40)	22,400
Heavy Duty Truck (Diesel)	8.0	14	322 (200)	22,400
Total				44,800
Daily Emissions				**4.5E-02 metric tons (5.0E-02 tons)**

Table ER RAI 4-4F.2 Offsite Vehicle Air Emissions During Operations

Estimated Vehicle Type	Emission Factor (g/mi)	Estimated Daily Number of Vehicles	Estimated Daily Mileage km (mi)	Daily Work Day Emissions (g)
NONMETHANE HYDROCARBONS				
Light Duty Vehicles (Gasoline)	1.2	210	64.4 (40)	10,080
Heavy Duty Truck (Diesel)	2.1	18	805 (500)	18,900
Total				28,980
Daily Emissions				**2.9E-02 metric tons (3.2E-02 tons)**
CARBON MONOXIDE				
Light Duty Vehicles	4.6	210	64.4 (40)	38,640
Heavy Duty Truck	10.2	18	805 (500)	91,800
Total				130,440
Daily Emissions				**1.3E-01 metric tons (1.4E-01 tons)**
NITROGEN OXIDES				
Light Duty Vehicles	0.7	210	64.4 (40)	5,880
Heavy Duty Truck	8.0	18	805 (500)	72,000
Total				77,880
Daily Emissions				**7.8E-02 metric tons (8.6E-02 tons)**

Table ER RAI 4-6A.1a Supply Materials Shipped to the Proposed NEF Construction Year 1

Mode of Shipment	Type of Supply Material	Origin of Shipment	Estimated Number of Shipments
Truck	Concrete	Local supplier	2,600 trucks
Rail and truck	Pre-cast Concrete	Texas	903 railcars and/or truckloads
Truck (possibly rail)	Structural and Miscellaneous Steel	Texas	69 trucks
Truck	Piping Spool Pieces	Texas	67 trucks
Truck (possibly rail)	Overhead Cranes	Texas	7 trucks
Truck	HVAC Units	Local supplier	33 trucks
Truck	Ductwork	Local supplier	25 trucks
Truck	Electrical Motors	Local supplier	5 trucks
Truck	Electrical Wire, Conduit, and Cable Tray	Local supplier	7 trucks

Table ER RAI 4-6A.1b Supply Materials Shipped to the Proposed NEF Construction Year 2

Mode of Shipment	Type of Supply Material	Origin of Shipment	Estimated Number of Shipments
Truck	Concrete	Local supplier	2,600 trucks
Rail and truck	Pre-cast Concrete	Texas	451 railcars and/or truckloads
Truck (possibly rail)	Structural and Miscellaneous Steel	Texas	34 trucks
Truck	Built-up Roofing	Local supplier	21 trucks
Truck	Piping Spool Pieces	Texas	67 trucks
Truck (possibly rail)	Overhead Cranes	Texas	3 trucks
Truck	HVAC Units	Local supplier	17 trucks
Truck	Ductwork	Local supplier	25 trucks
Truck	Electrical Motors	Local supplier	5 trucks
Truck	Electrical Wire, Conduit, and Cable Tray	Local supplier	7 trucks

Table ER RAI 4-6A.1c Supply Materials Shipped to the Proposed NEF Construction Year 3

Mode of Shipment	Type of Supply Material	Origin of Shipment	Estimated Number of Shipments
Truck	Concrete	Local supplier	2,600 trucks
Truck	Piping Spool Pieces	Texas	66 trucks
Truck	Electrical Wire, Conduit, and Cable Tray	Local supplier	6 trucks

Table ER RAI 4-6A.2a Waste Materials Shipped from the Proposed NEF Construction Year 1

Mode of Shipment	Type of Waste Material	Destination of Shipment	Estimated Number of Shipments
Truck (possibly rail)	Construction Debris	Lea County Landfill (possibly other location)	234 trucks

Table ER RAI 4-6A.2b Waste Materials Shipped from the Proposed NEF Construction Year 2

Mode of Shipment	Type of Waste Material	Destination of Shipment	Estimated Number of Shipments
Truck (possibly rail)	Construction Debris	Lea County Landfill (possibly other location)	233 trucks

Table ER RAI 4-6A.2c Waste Materials Shipped from the Proposed NEF Construction Year 3

Mode of Shipment	Type of Waste Material	Destination of Shipment	Estimated Number of Shipments
Truck (possibly rail)	Construction Debris	Lea County Landfill (possibly other location)	233 trucks

Table ER RAI 4-6B.1 Container Curie Content by Isotope
(at 1 year decay and in-growth)

Material: Container Type: Isotope	Feed (UF_6) 48Y cylinder	Feed (UF_6) 48X cylinder	Product (UF_6) 30B cylinder	Depleted (UF_6) 48Y cylinder	Heels only 48Y cylinder	Solid Waste 55 gal. drum
Tl-207	4.28E-08	3.29E-08	5.74E-08	2.05E-08	1.39E-08	6.84E-12
Tl-208	1.75E-15	1.35E-15	2.35E-15	8.35E-16	1.25E-15	2.80E-19
Pb-210	5.52E-11	4.25E-11	8.71E-11	2.48E-11	4.49E-11	8.82E-15
Pb-211	4.29E-08	3.30E-08	5.75E-08	2.05E-08	1.39E-08	6.86E-12
Pb-212	4.87E-15	3.75E-15	6.53E-15	2.32E-15	3.47E-15	7.79E-19
Pb-214	5.45E-09	4.20E-09	8.61E-09	2.45E-09	1.91E-09	8.72E-13
Bi-210	5.52E-11	4.25E-11	8.71E-11	2.48E-11	4.38E-11	8.82E-15
Bi-211	4.29E-08	3.30E-08	5.75E-08	2.05E-08	1.39E-08	6.86E-12
Bi-212	4.87E-15	3.75E-15	6.53E-15	2.32E-15	3.47E-15	7.79E-19
Bi-214	5.45E-09	4.20E-09	8.61E-09	2.45E-09	1.91E-09	8.72E-13
Po-210	1.79E-11	1.38E-11	2.82E-11	8.04E-12	2.32E-11	2.86E-15
Po-211	1.20E-10	9.25E-11	1.61E-10	5.75E-11	3.90E-11	1.92E-14
Po-212	3.12E-15	2.40E-15	4.18E-15	1.49E-15	2.22E-15	4.99E-19
Po-214	5.45E-09	4.20E-09	8.60E-09	2.45E-09	1.91E-09	8.71E-13
Po-215	4.29E-08	3.30E-08	5.75E-08	2.05E-08	1.39E-08	6.86E-12
Po-216	4.87E-15	3.75E-15	6.53E-15	2.32E-15	3.47E-15	7.79E-19
Po-218	5.45E-09	4.20E-09	8.61E-09	2.45E-09	1.91E-09	8.72E-13
Rn-219	4.29E-08	3.30E-08	5.75E-08	2.05E-08	1.39E-08	6.86E-12
Rn-220	4.87E-15	3.75E-15	6.53E-15	2.32E-15	3.47E-15	7.79E-19
Rn-222	5.45E-09	4.20E-09	8.61E-09	2.45E-09	1.91E-09	8.72E-13
Fr-223	5.92E-10	4.56E-10	7.94E-10	2.83E-10	2.09E-10	9.47E-14
Ra-223	4.29E-08	3.30E-08	5.75E-08	2.05E-08	1.39E-08	6.86E-12
Ra-224	4.87E-15	3.75E-15	6.53E-15	2.32E-15	3.47E-15	7.79E-19
Ra-226	5.45E-09	4.20E-09	8.61E-09	2.45E-09	1.93E-09	8.72E-13
Ra-228	4.37E-14	3.37E-14	5.86E-14	2.09E-14	1.48E-14	6.99E-18
Ac-227	4.29E-08	3.30E-08	5.75E-08	2.05E-08	1.51E-08	6.86E-12
Ac-228	4.37E-14	3.37E-14	5.86E-14	2.09E-14	1.48E-14	6.99E-18
Th-227	4.23E-08	3.26E-08	5.67E-08	2.02E-08	1.42E-08	6.77E-12
Th-228	4.87E-15	3.75E-15	6.53E-15	2.32E-15	3.53E-15	7.79E-19
Th-230	2.52E-05	1.94E-05	3.97E-05	1.13E-05	3.01E-06	4.03E-09
Th-231	1.29E-01	9.91E-02	1.73E-01	6.16E-02	0.00E+00	2.06E-05
Th-232	8.74E-13	6.73E-13	1.17E-12	4.17E-13	1.04E-13	1.40E-16
Th-234	2.80E+00	2.15E+00	5.10E-01	2.81E+00	1.06E-05	4.47E-04
Pa-231	2.72E-06	2.10E-06	3.65E-06	1.30E-06	3.28E-07	4.36E-10
Pa-234m	2.80E+00	2.15E+00	5.10E-01	2.81E+00	1.06E-05	4.47E-04
Pa-234	3.64E-03	2.80E-03	6.63E-04	3.65E-03	1.38E-08	5.82E-07
U-234	2.80E+00	2.15E+00	4.42E+00	1.26E+00	9.01E-08	4.47E-04
U-235	1.29E-01	9.91E-02	1.73E-01	6.16E-02	0.00E+00	2.06E-05
U-236	1.77E-02	1.36E-02	2.38E-02	8.46E-03	0.00E+00	2.83E-06
U-238	2.80E+00	2.15E+00	5.10E-01	2.81E+00	0.00E+00	4.47E-04
Total	1.15E+01	8.83E+00	6.31E+00	9.82E+00	2.48E-05	1.83E-03

Table ER RAI 4-6B.2 Estimated Dose Rates from UF_6 and Waste Containers

Container Type [1]	Source Material	Dose Rate at Surface µSv/hr (mrem/hr)	Dose Rate at 1 meter on-side midpoint µSv/hr (mrem/hr)	Dose Rate at 2 meters on axis µSv/hr (mrem/hr)
48Y cylinder	Natural U Feed (UF_6)	5.3 (0.53)	2.9 (0.29)	0.7 (0.0722)
48X cylinder	Natural U Feed (UF_6)	5.3 (0.53)	2.6 (0.26)	0.72 (0.072)
30 B cylinder	Enriched U Product (UF_6)	9.6 (0.96)	1.9 (0.19)	0.32 (0.032)
48Y cylinder	Depleted U (UF_6)	5.4 (0.54)	2.8 (0.28)	0.72 (0.072)
55 gal. drum	Solid Radwaste Materials	0.80 (0.080)	0.042 (0.0042)	0.013 [2] (0.0013)

Note:

1. Containers containing only "heels" for 48X or 48Y were not provided due to the low curie content and relatively short half-life of uranium progeny. For example, 30 days after removal of all UF_6, the progeny activity corresponds to about 20% of that of natural uranium; in 90 days it has decayed to less than 4%.
2. Waste drums assumed to be placed upright on truck.

Table ER RAI 4-6B.3 Annual Shipments to/from NEF (by Truck)

Material	Container Type	Estimated Number of Shipments[1]
Natural U Feed (UF_6)	48X or 48Y	345 to 690
Enriched U Product (UF_6)	30B	70 to 175
Depleted U (UF_6)	48Y	627
Solid Waste	55 gallon drum	8

Note:

1. 48Y cylinders are shipped one per truck. 48X cylinders are typically shipped two per truck. 30B cylinders are typically shipped two per truck, although up to five cylinders per truck can be shipped.

Table ER RAI 4-6B.4 Annual Air Pollution Impacts from Normal Transportation[1]

Facility	Material Description	Distance km (mi)	Trips Per Year	Air Pollutant Annual Impact		
				HC[2] metric ton (ton)	CO[2] metric ton (ton)	NOx[2] metric ton (ton)
UF_6 Conversion Facility Port Hope, Ontario	Feed	2869 (1782)	690	2.6 (2.8)	12.5 (13.87)	9.8 (10.8)
UF_6 Conversion Facility Metropolis, IL	Feed	1674 (1040)	690	1.5 (1.7)	7.32 (8.1)	5.7 (6.3)
Fuel Fabrication Facility Hanford, WA	Product	2574 (1599)	175	0.6 (0.6)	2.9 (3.1)	2.2 (2.5)
Fuel Fabrication Facility Columbia, SC	Product	2264 (1406)	175	0.5 (0.6)	2.5 (2.8)	2.0 (2.2)
Fuel Fabrication Facility Wilmington, NC	Product	2576 (1600)	175	0.6 (0.6)	2.9 (3.1)	2.2 (2.5)
Barnwell Disposal Site Barnwell, SC	LLW Disposal	2320 (1441)	8	0.02 (0.03)	0.1 (0.1)	0.1 (0.1)
Envirocare of Utah Clive, UT	LLW and Mixed Disposal	1636 (1016)	8	0.02 (0.02)	0.1 (0.1)	0.1 (0.1)
GTS Duratek Oak Ridge, TN	Waste Processor	1993 (1238)	8	0.02 (0.02)	0.1 (0.1)	0.1 (0.1)
Depleted UF_6 Conversion Facility Paducah, KY	Depleted UF_6 Disposal	1670 (1037)	627	1.4 (1.5)	6.6 (7.3)	5.2 (5.7)
Depleted UF_6 Conversion Facility Portsmouth, OH	Depleted UF_6 Disposal	2243 (1393)	627	1.8 (2.0)	8.9 (9.8)	7.0 (7.7)

Note:

1. The total number of transportation trips per year to and from the NEF has been applied to each material type for each potential designation (e.g., there are a total of 690 feed cylinder transports per year, not 690 from each of the potential suppliers).
2. HC = hydrocarbons
   CO = carbon monoxide
   NOx = nitrogen oxides

Table ER RAI 4-6B.5 Annual Transportation Accidents

Material Description	Shipments Per Year	Estimated Number of Accidents Per Year
Feed	690	0.22
Product	175	0.054
Low- Level Rad Waste and Mixed Disposal	8	0.0025
Depleted UF_6 Disposal	627	0.19
Totals	1,500	0.47

Table ER RAI 4-6B.6 Transportation Destinations (to/from) NEF

Facility	Material Description
UF6 Conversion Facility Port Hope, Ontario	Feed (48Y)
UF6 Conversion Facility Metropolis, IL	Feed (48Y)
Fuel Fabrication Facility Hanford, WA	Product (30B)
Fuel Fabrication Facility Columbia, SC	Product (30B)
Fuel Fabrication Facility Wilmington, NC	Product (30B)
Barnwell Disposal Site Barnwell, SC	Waste (Drum)
Envirocare of Utah Clive, UT	Waste (Drum)
GTS Duratek Oak Ridge, TN	Waste (Drum)
Conversion Facility Paducah, Kentucky	Depleted U (48Y)
Conversion Facility Portsmouth, Ohio	Depleted U (48Y)

Table ER RAI 4-7F.1 Causes of Injuries at Capenhurst (1999-2003)

Main Causes of Injury at UCL 1999-2003	Number	Percent of Total
Handling tools, equipment or other items	10	40%
Impact (striking objects or objects falling)	3	12%
Slips, trips or falls on the same level	8	32%
Chemical contact	2	8%
Welding	2	8%
Total	25	

Table ER RAI 7-1A.1 Descriptions of Job Types During Operation

Job Category	Level	Number of Jobs	Education/Training[2][3][4][5]	Average Monthly Pay[6][7]
Facility Operator	Skilled	NA[1]	HS Diploma, Associate/Advanced	$3,500
Shift Supervisor	Skilled	NA[1]	HS Diploma, Associate/Advanced	$3,500
Radiation Protection & Chemistry Technicians	Skilled	NA[1]	HS Diploma, Associate/Basic	$3,500
Maintenance Technician	Skilled	NA[1]	HS Diploma, Associate/Basic	$3,500
Security Guard	Skilled	NA[1]	HS Diploma, Associate/Basic	$3,500
Stores Personnel	Skilled	NA[1]	HS Diploma, Associate/Basic	$3,500
Custodial/Janitorial	Semi-Skilled	NA[1]	HS Diploma/Basic	$3,500
Total Skilled / Semi-Skilled		126		
Administrative Personnel	Administrative	21	HS Diploma, Associate	$2,500
Professional Staff (engineering, scientific, technical)	Professional	42	Associate, Bachelor or Master/Basic to Advanced	$5,167
Management	Managerial	21	Associate, Bachelor or Master/Basic to Advanced	$7,917
	Total	210		

Notes:
1. Further breakdown for the skilled level cannot be provided for reasons of security.
2. HS Diploma=High School Diploma, minimum requirement
3. Basic=basic knowledge of NEF provided in training
4. Advanced=advanced knowledge of NEF provided in training
5. Training will be provided by LES in partnership with local educational institutions.
6. Pay is stated in 2002 real dollars; not adjusted for anticipated price or wage inflation over the 30-year period analyzed.
7. Average monthly pay is provided by "Level." Further refinement by "Job Category" is not available at this time.

Table ER RAI 7-1B.1 Estimated Construction Material Yearly Purchases

Commodity	Quantity	Total Value (Material Cost)	Yearly Purchases
Concrete/Forms/Rebar	59196 m^3 (77,425 yd^3)	$9,441,000	$9,441,000
Pre-Cast Concrete	120774 m^2 (1,300,000 ft^2)	$25,232,000	$8,410,667
Structural Steel	1865 t (2,056 tons)	$5,524,000	$5,524,000
Architectural Items	1 Lot	$26,995,000 Finishes, etc.	$26,995,000
HVAC Systems	109 Each	$27,098,000 Systems Mat'ls.	$27,098,000
Utility Piping	55656 m (182,597 linear ft)	$20,777,000	$20,777,000
Electrical Conduit & Wire	361898 m (1,187,328 linear ft)	$14,174,000	$7,087,000

Table ER RAI 7-1B.2 Estimated Yearly Labor Costs for Construction

Type of Work	Number Of Craft-Hours	Approx. No. People	Total Value	Yearly Purchases
Civil & Site Work	163,000	65 people for 1 year	$5,264,900	$5,264,900
Concrete Work	541,000	70 people for 3 years	$17,420,200	$5,806,733
Structural Steel	54,000	25 people for 1 year	$1,852,200	$1,852,200
Pre-cast Concrete	166,000	66 people for 1 year	$5,345,200	$5,345,200
Architectural Finishes	284,000	150 people for 1 year	$9,088,000	$9,088,000
Utility Equipment	23,000	15 people for 1 year	$969,450	$969,450
HVAC Sys. & Ductwork	186,000	40 people for 1 year	$6,175,200	$6,175,200
Electrical Conduit & Wire	280,000	70 people for 2 years	$10,556,000	$5,278,000

ATTACHMENT 3

Louisiana Energy Services
Response to April 29, 2004,
Request for Additional Information

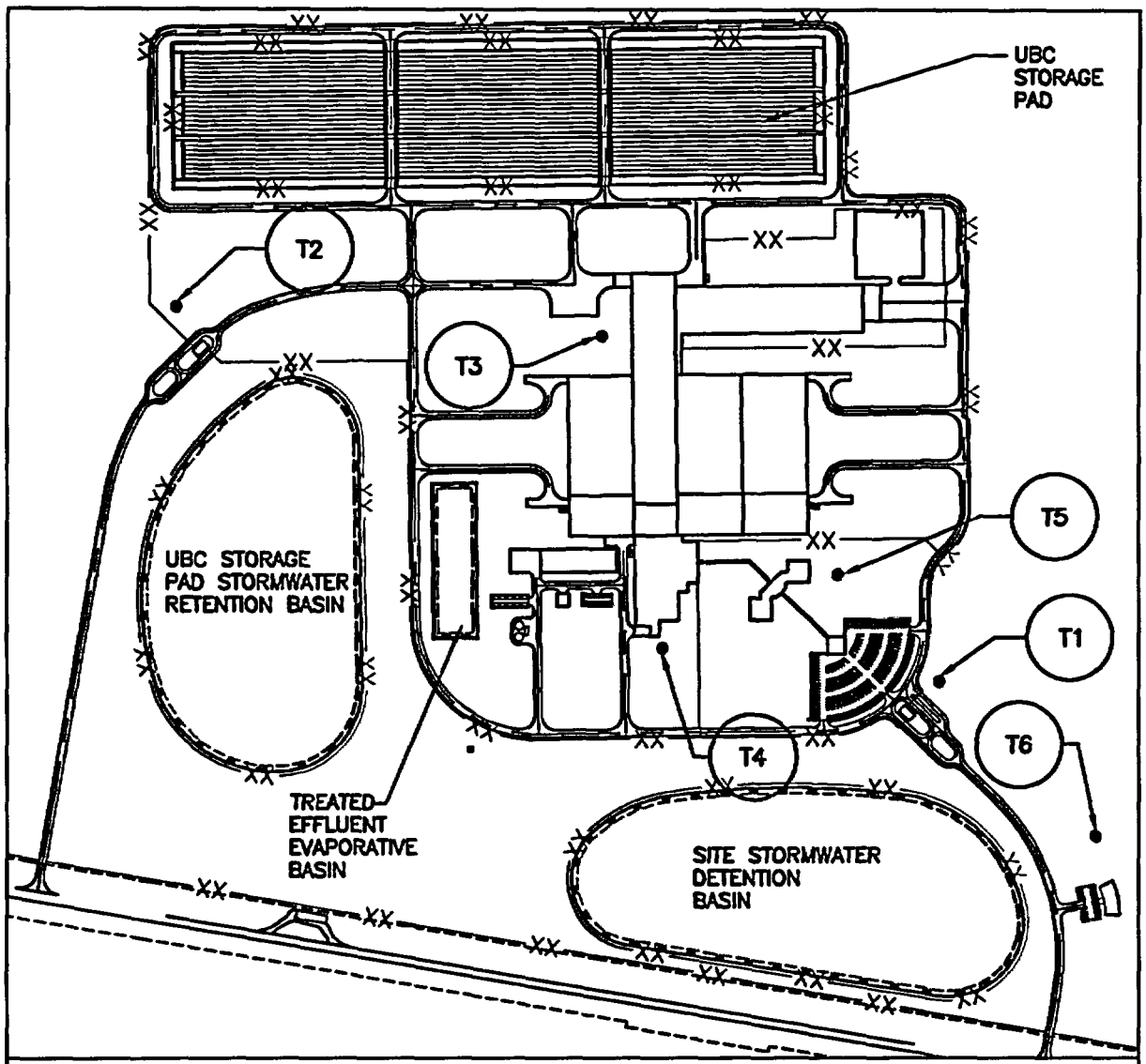
Figures Referenced from Responses

The following figures are referenced in responses to various RAIs:

- Figure ER RAI 2-1, Location of Current CO_2 Line.
- Figure ER RAI 2-2, Planned Septic Tank System Locations.
- Figure ER RAI 2-7C.1, Aerial View of Eddy County Site.
- Figure ER RAI 2-7D.1, Contributions by Grouped Criteria.
- Figure ER RAI 2-7D.2, Contributions by Criteria.
- Figure ER RAI 3-1A, Soil Sample Locations.
- Figure ER RAI 3-3, Comparison of Wind Direction Data.
- Figure ER RAI 3-4A, County Map, Proposed Area of Critical Environmental Concern (ACEC), Lesser Prairie Chicken.
- Figure ER RAI 4-1.1, Aerial View.
- Figure ER RAI 4-1.2, View to the Northwest.
- Figure ER RAI 4-1.3, View to the East.
- Figure ER RAI 4-1.4, View to the South.
- Figure ER RAI 4-1.5, View to the West.
- Figure ER RAI 4-4D, Release Point Locations.
- Figure ER RAI 6-1C, Groundwater Monitoring Well Locations.

Figure removed under 10 CFR 2.390.

Figure ER RAI 2-1
DATE: 5/20/04



LEGEND:

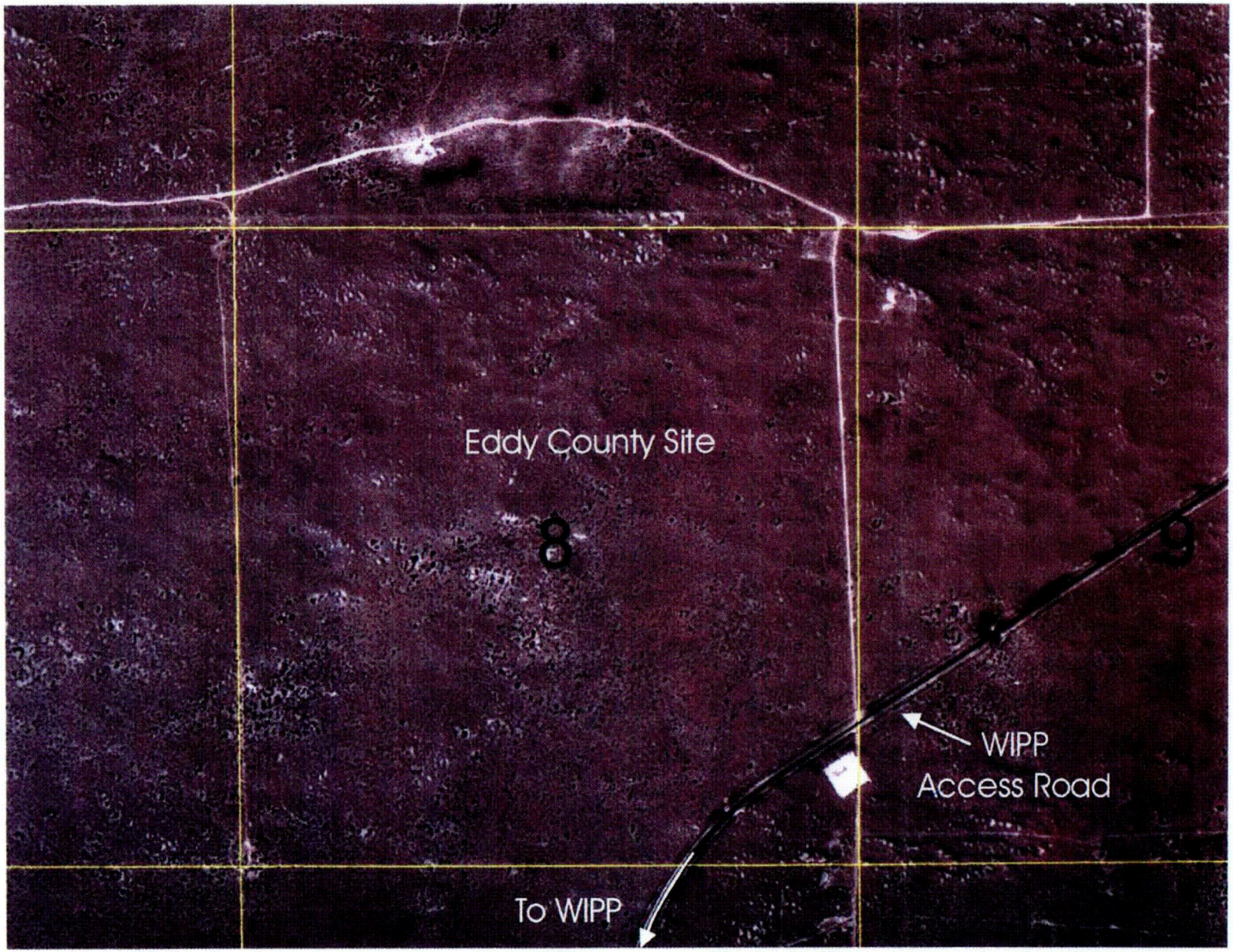
T1 SEPTIC TANK SYSTEM LOCATION (TYPICAL)

600 0 600
Scale: FEET

200 0 200
Scale: METERS

NORTH

FIGURE ER RAI 2-2	PLANNED SEPTIC TANK SYSTEM LOCATIONS
DATE: 5/20/04	

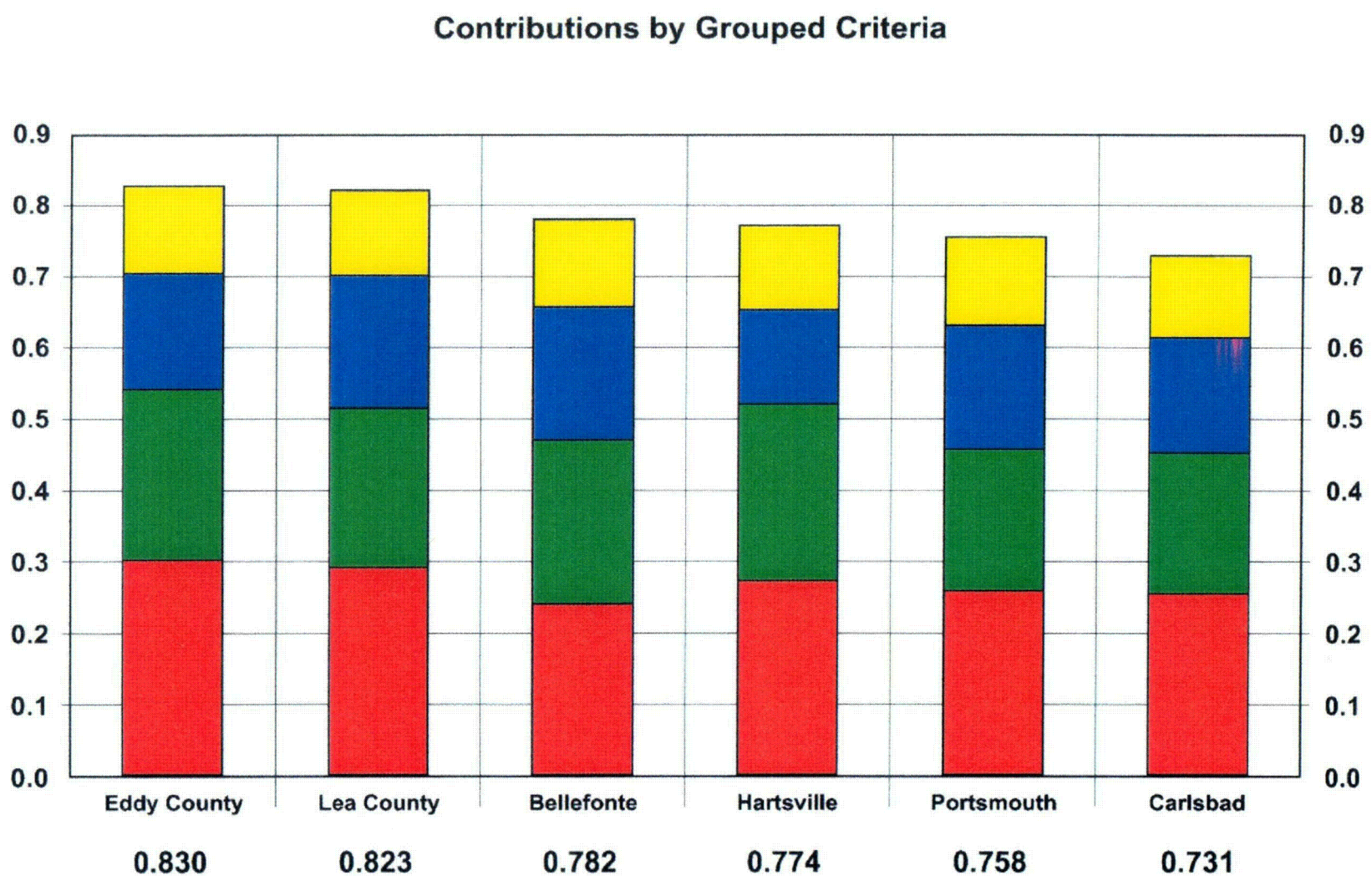


NOTE: Scale not shown, sections are 1.6 km (1 mi) by 1.6 km (1 mi)

NORTH

Figure ER RAI 2-7C.1	AERIAL VIEW OF EDDY COUNTY SITE
DATE: 5 / 20 / 04	

C02



Operational Efficiencies
Schedule for Commencing Operations
Environmental Acceptability
Operational Requirements

Figure ER RAI 2-7D.1	CONTRIBUTIONS BY GROUPED CRITERIA
DATE: 5 / 20 / 04	

C03

Contributions by Criteria

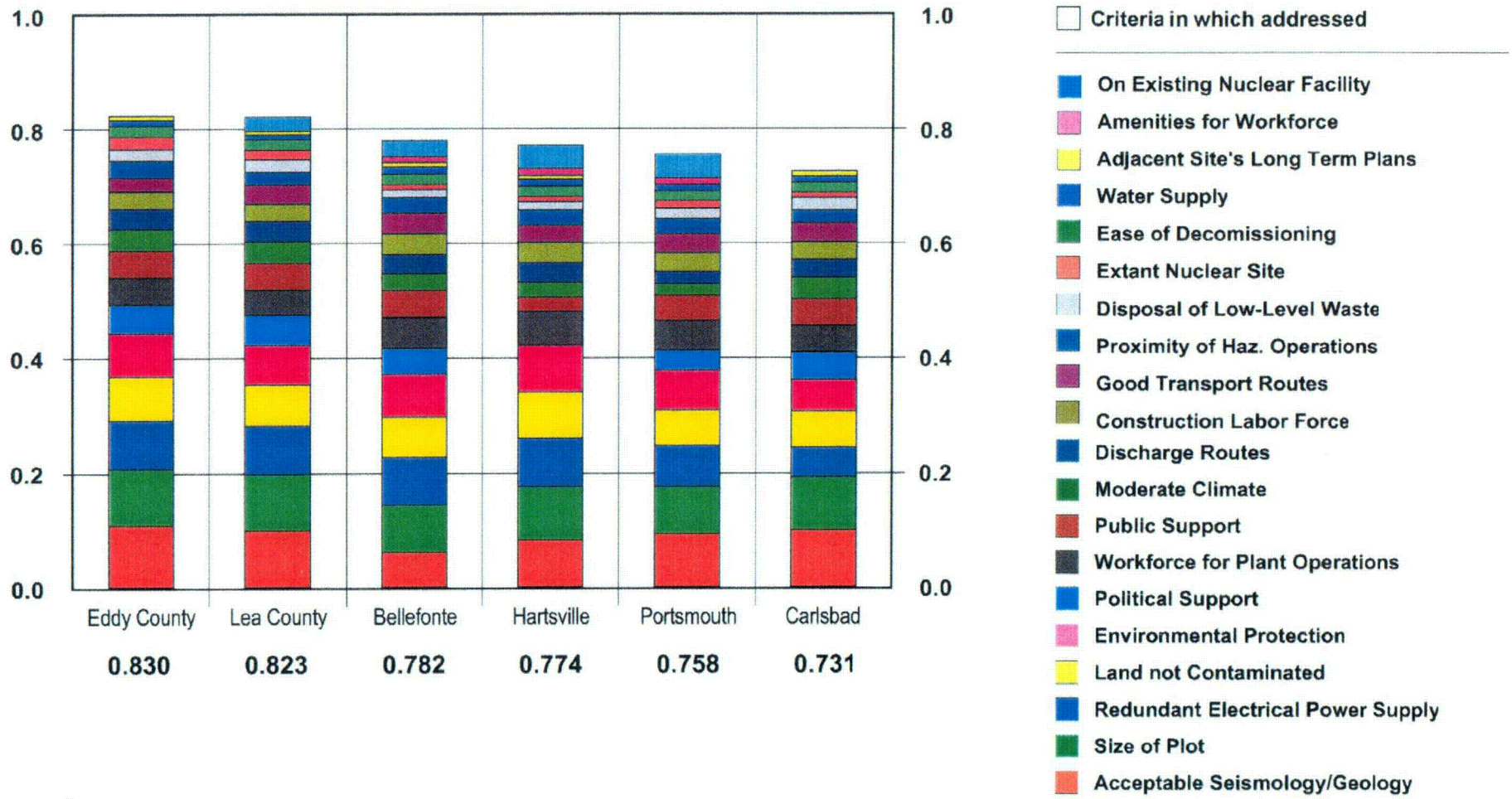


Figure ER RAI 2-7D.2	CONTRIBUTIONS BY CRITERIA
DATE: 5 / 20 / 04	

C04

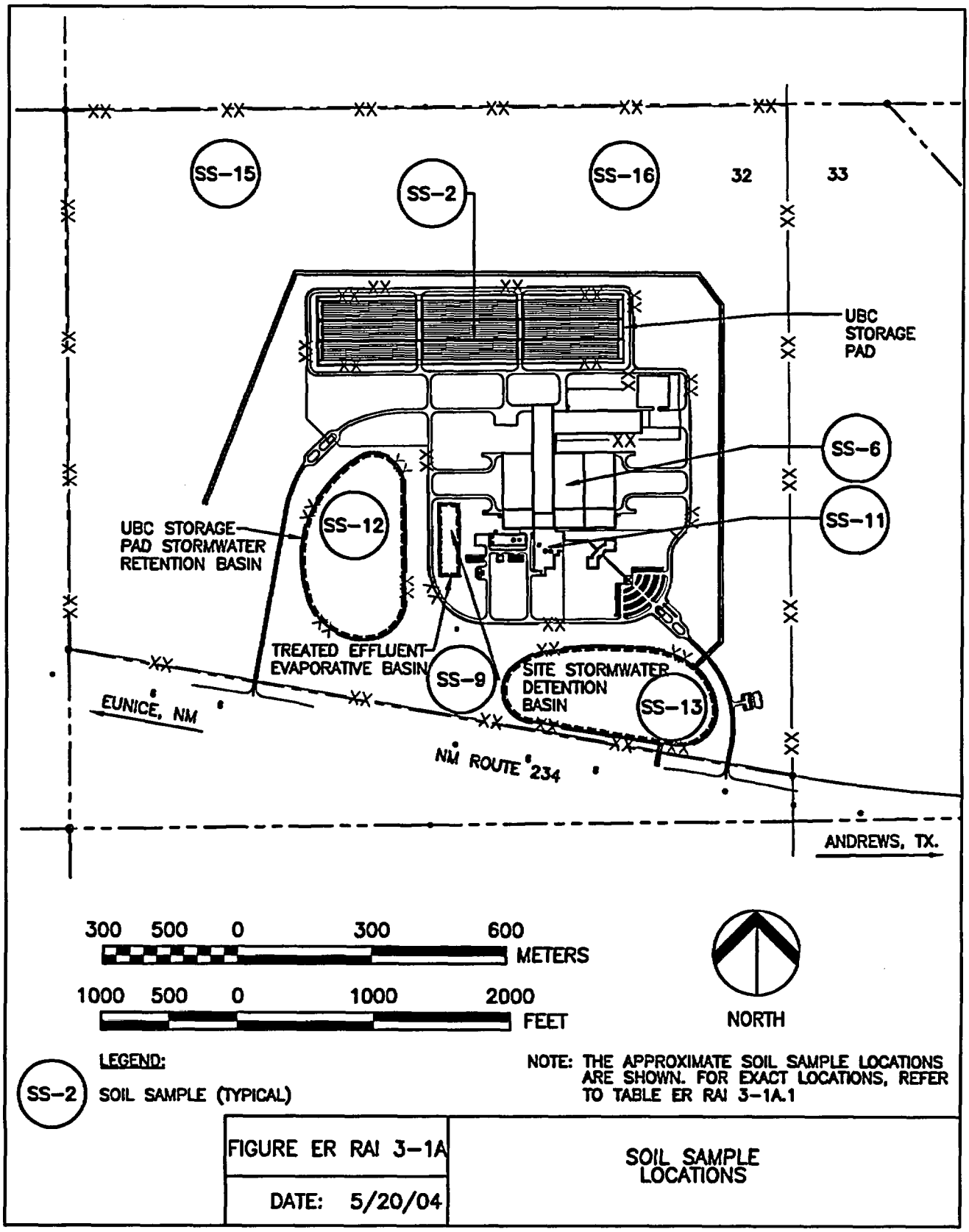


FIGURE ER RAI 3-1A	SOIL SAMPLE LOCATIONS
DATE: 5/20/04	

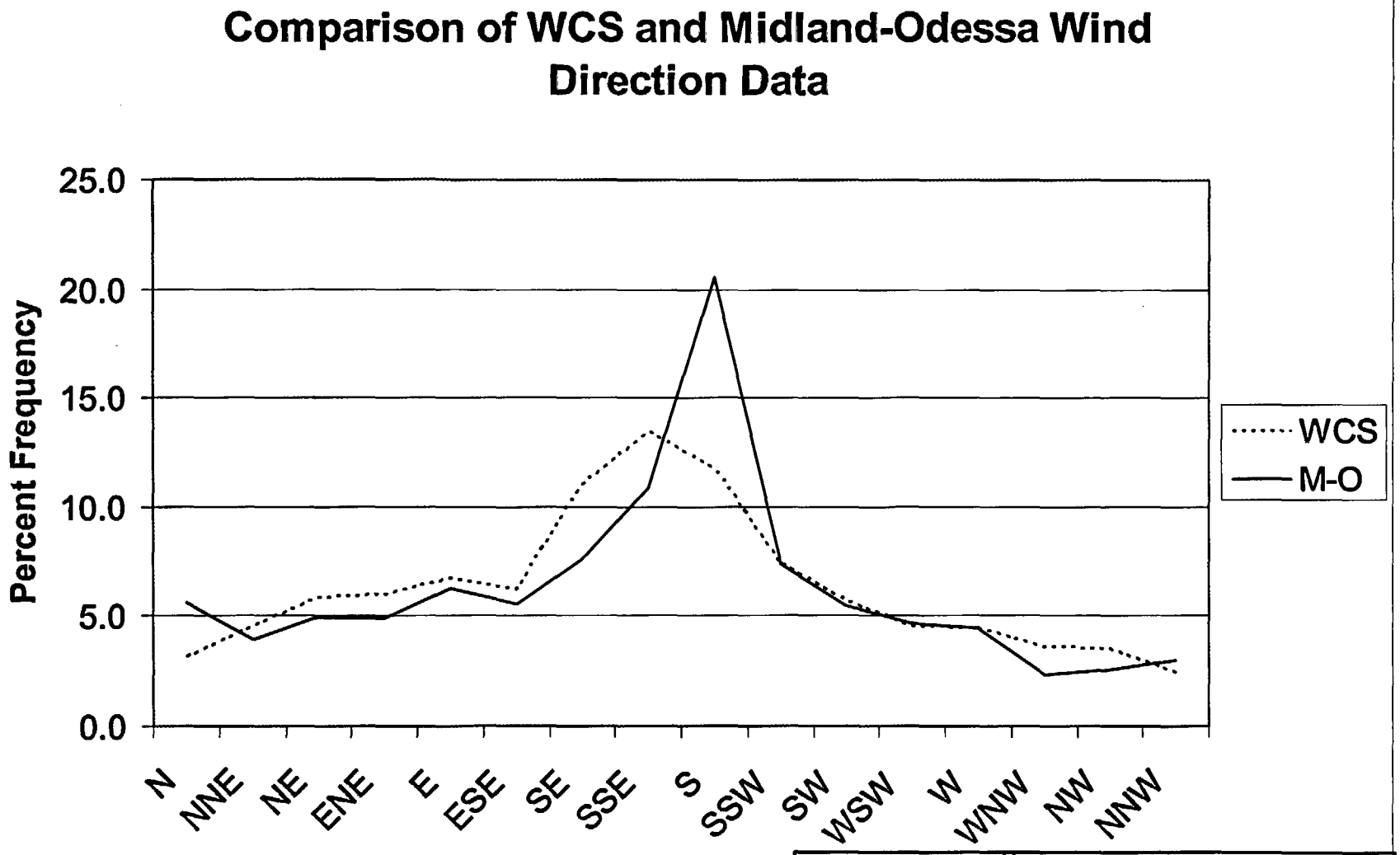
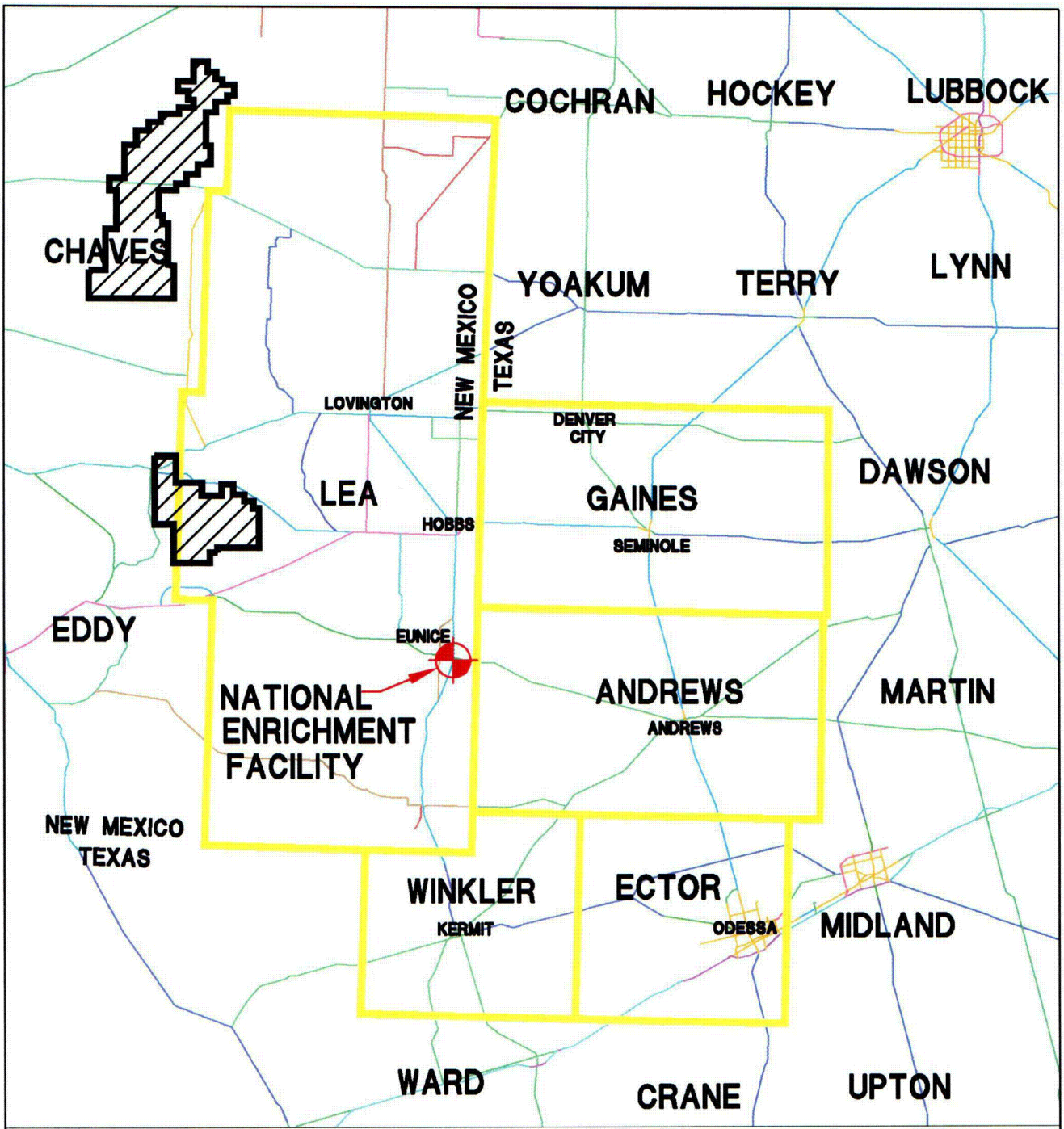


FIGURE ER RAI 3-3	Comparison of Wind Direction Data
DATE: 5/20/04	



14 0 14 28 42 56 70 KM

14 0 14 28 42 MILES

NORTH

MAP SOURCE:
U.S.CENSUS BUREAU
2000 INCORPORATED PLACES

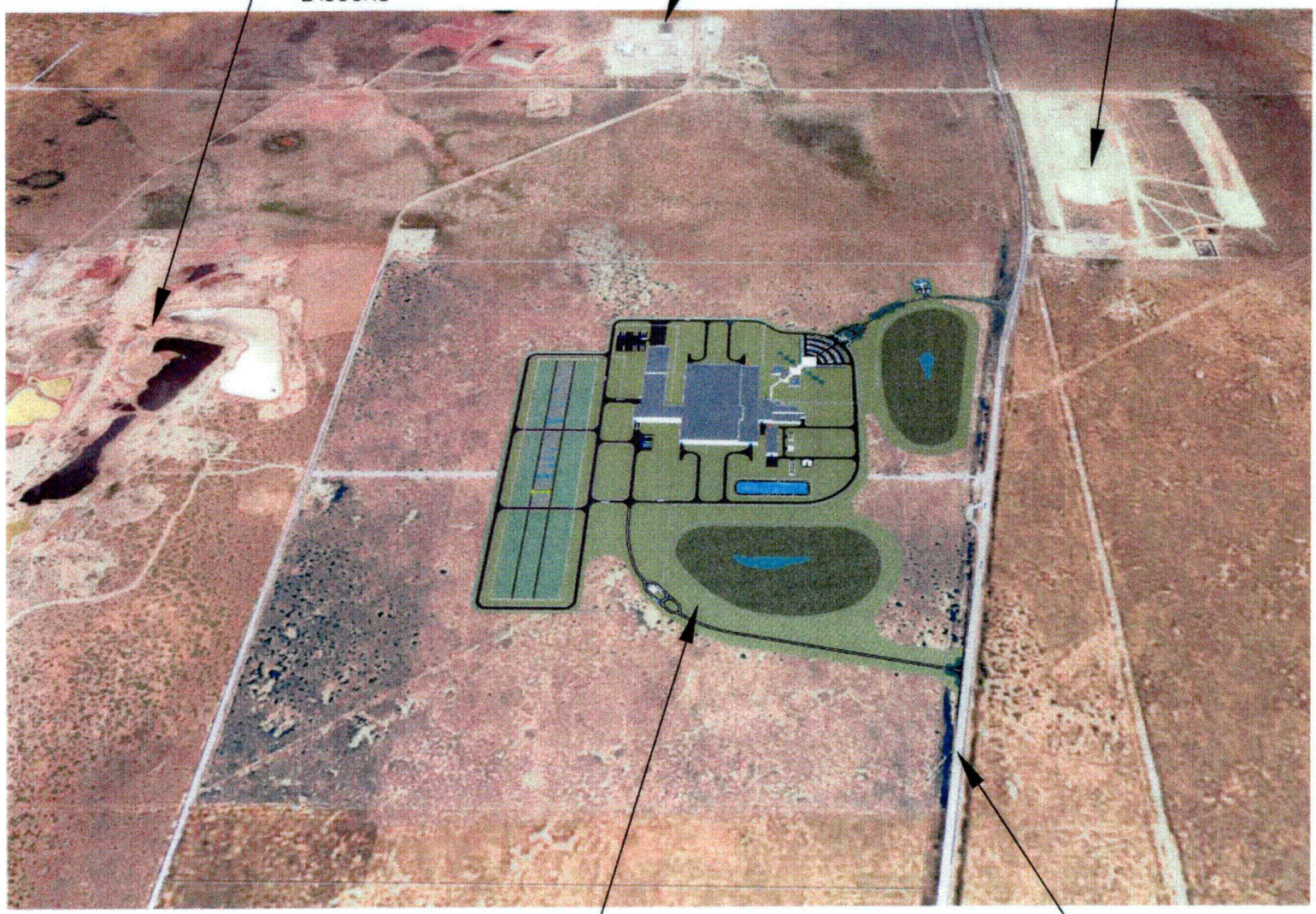
KEY:
APPROXIMATE LOCATION OF PROPOSED ACEC BOUNDARY

FIGURE ER RAI 3-4A

DATE: 5/20/04

COUNTY MAP
PROPOSED AREA OF CRITICAL ENVIRONMENTAL CONCERN (ACEC)
LESSER PRAIRIE CHICKEN

C05



NOTE:
THE GREEN SHADING IS MEANT TO HIGHLIGHT THE NEF FOOTPRINT. IT IS NOT INDICATIVE OF VEGETATION.

NORTH

Figure ER RAI 4-1.1	AERIAL VIEW
DATE: 5/20/04	

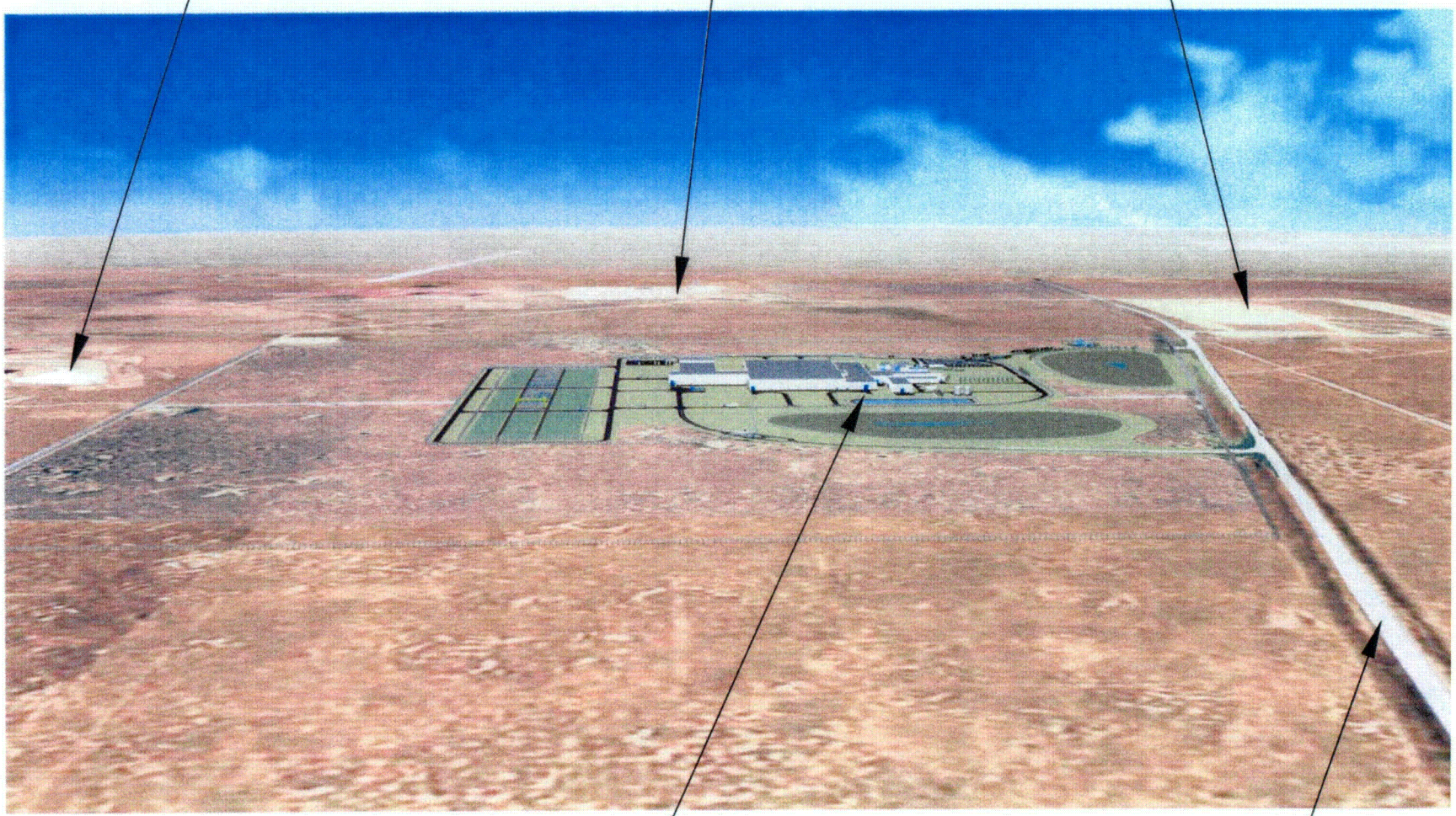
C06

NOTE:
THE GREEN SHADING IS MEANT TO HIGHLIGHT THE NEF FOOTPRINT. IT IS NOT INDICATIVE OF VEGETATION.

NORTH

Figure ER RAI 4-1.2	VIEW TO THE NORTHWEST
DATE: 5/20/04	

C07

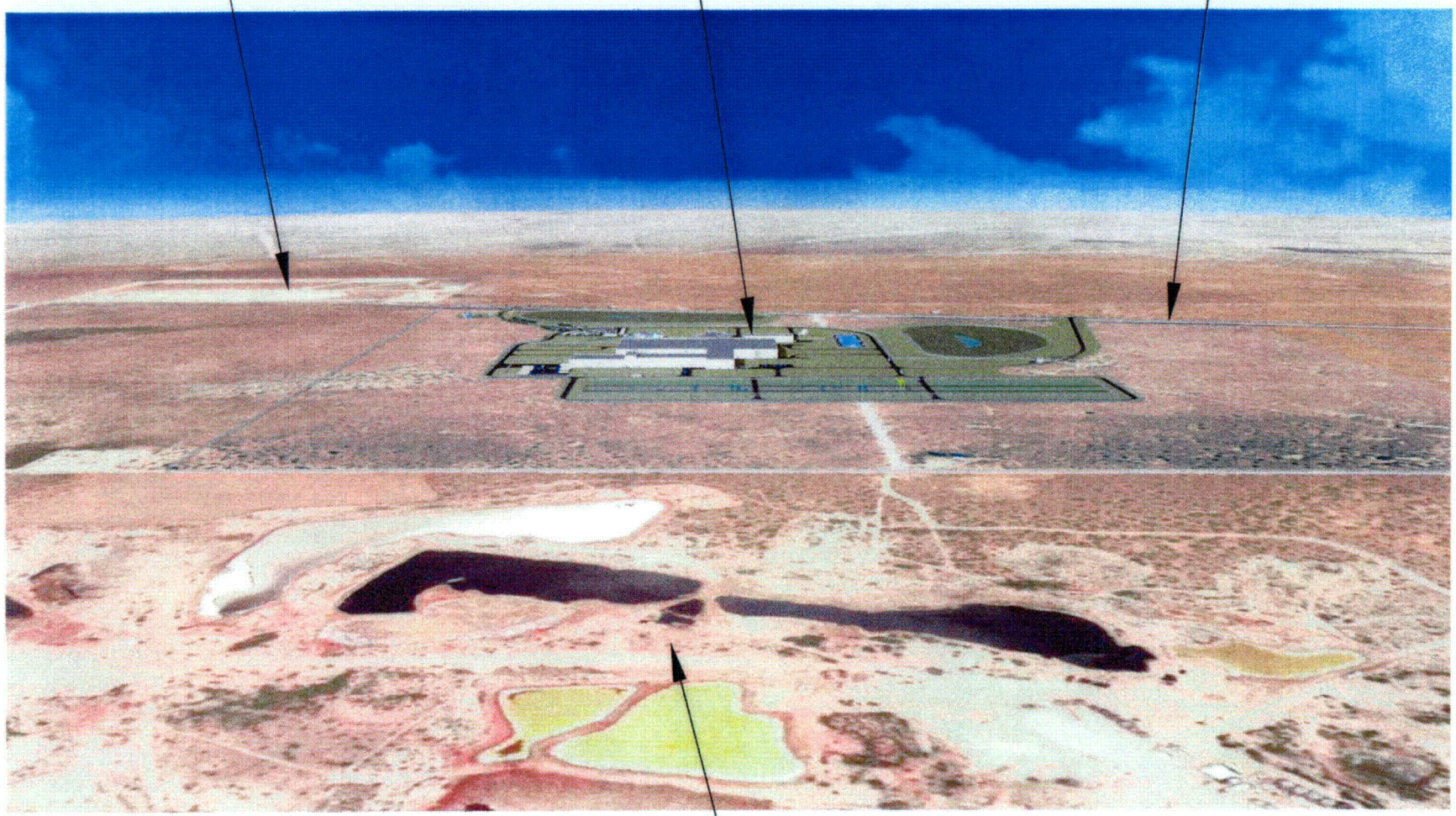


NOTE:
THE GREEN SHADING IS MEANT TO HIGHLIGHT THE NEF FOOTPRINT. IT IS NOT INDICATIVE OF VEGETATION.

NORTH

Figure ER RAI 4-1.3	VIEW TO THE EAST
DATE: 5/20/04	

C08

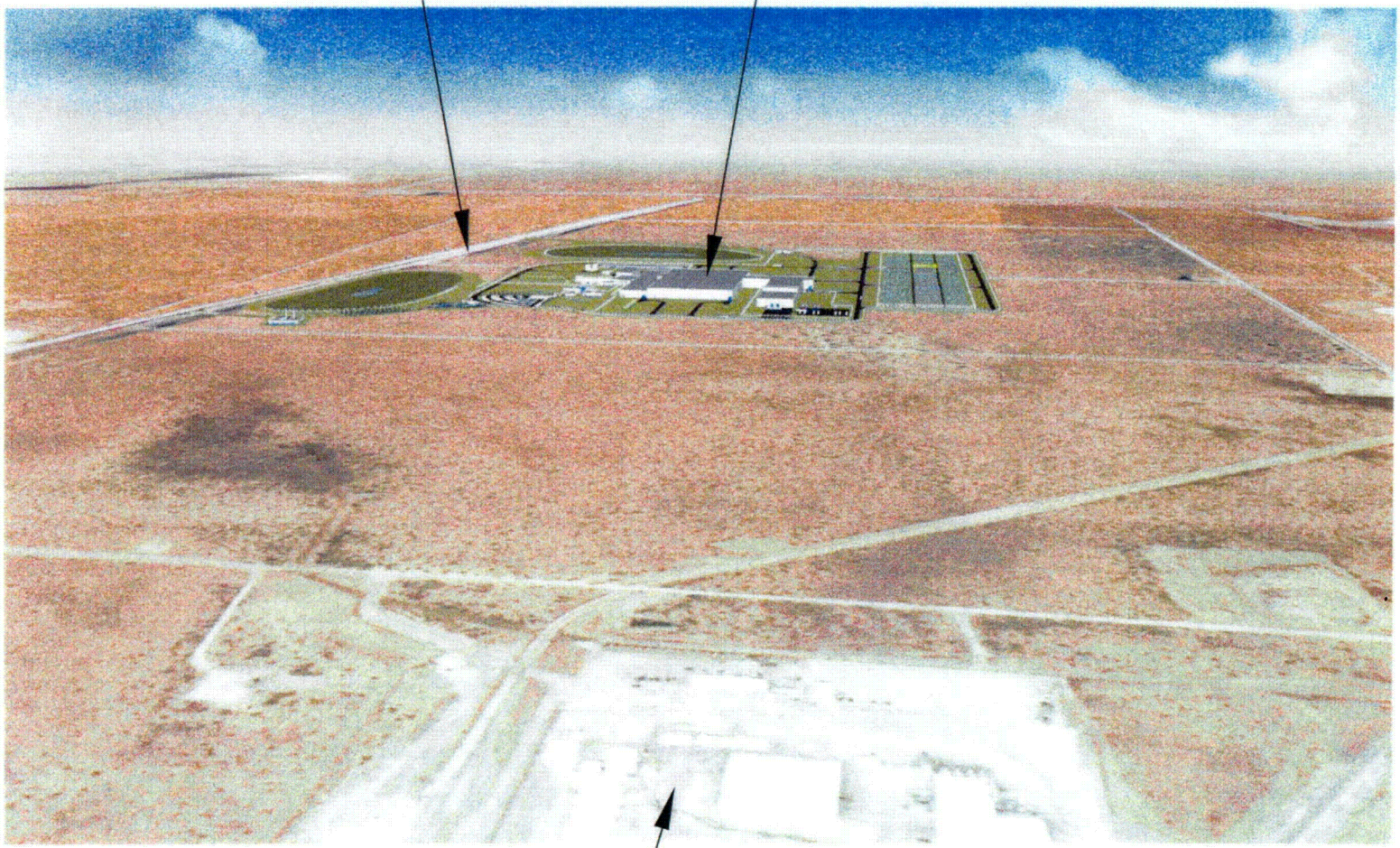


NOTE:
THE GREEN SHADING IS MEANT TO HIGHLIGHT THE NEF FOOTPRINT. IT IS NOT INDICATIVE OF VEGETATION.

NORTH

Figure ER RAI 4-1.4	VIEW TO THE SOUTH
DATE: 5/20/04	

C09



NOTE:
THE GREEN SHADING IS MEANT TO HIGHLIGHT THE NEF FOOTPRINT. IT IS NOT INDICATIVE OF VEGETATION.

NORTH

Figure ER RAI 4-1.5	VIEW TO THE WEST
DATE: 5/20/04	

C10

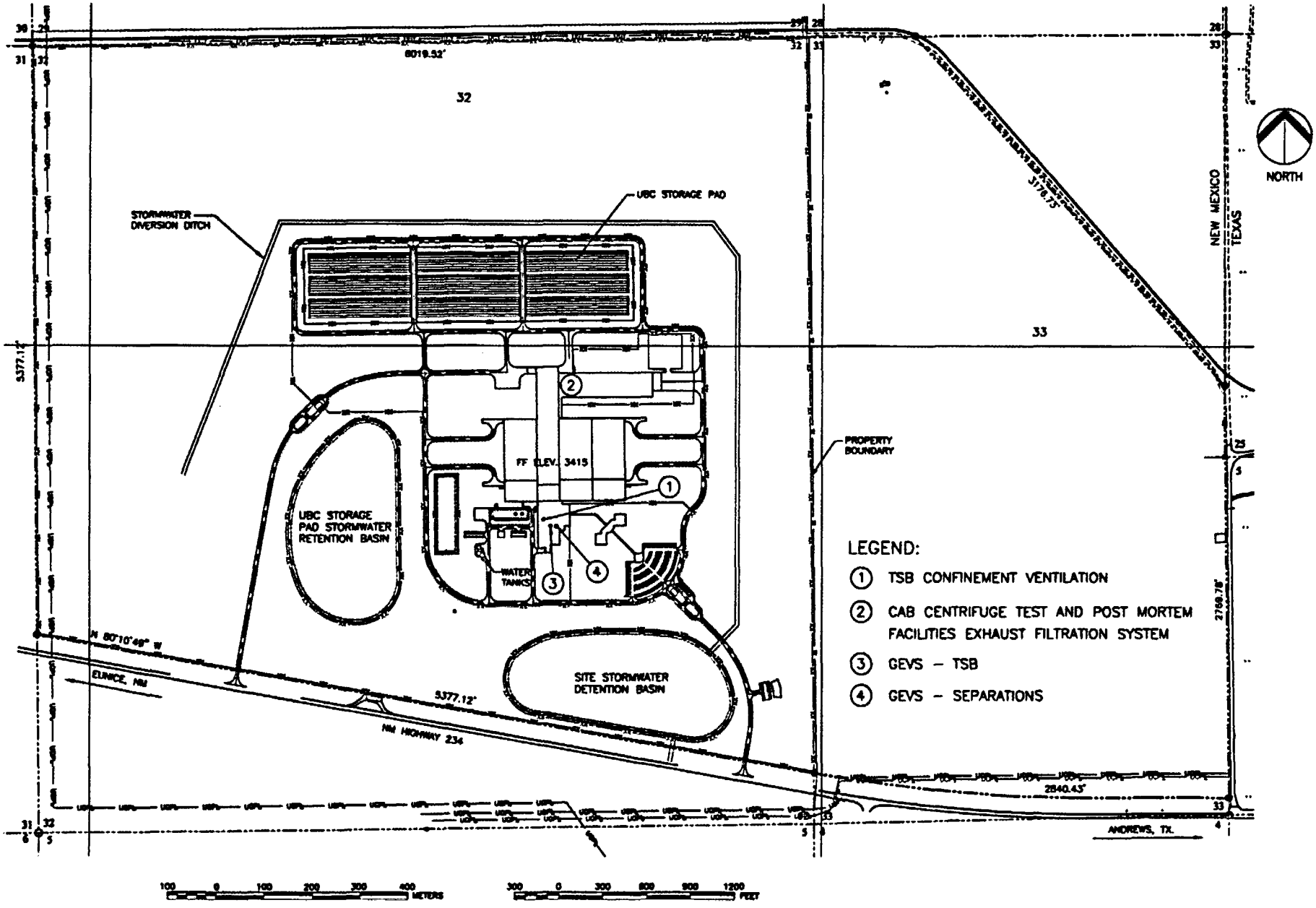


Figure ER RAI 4-4D	RELEASE POINT LOCATIONS
DATE: 5/20/04	

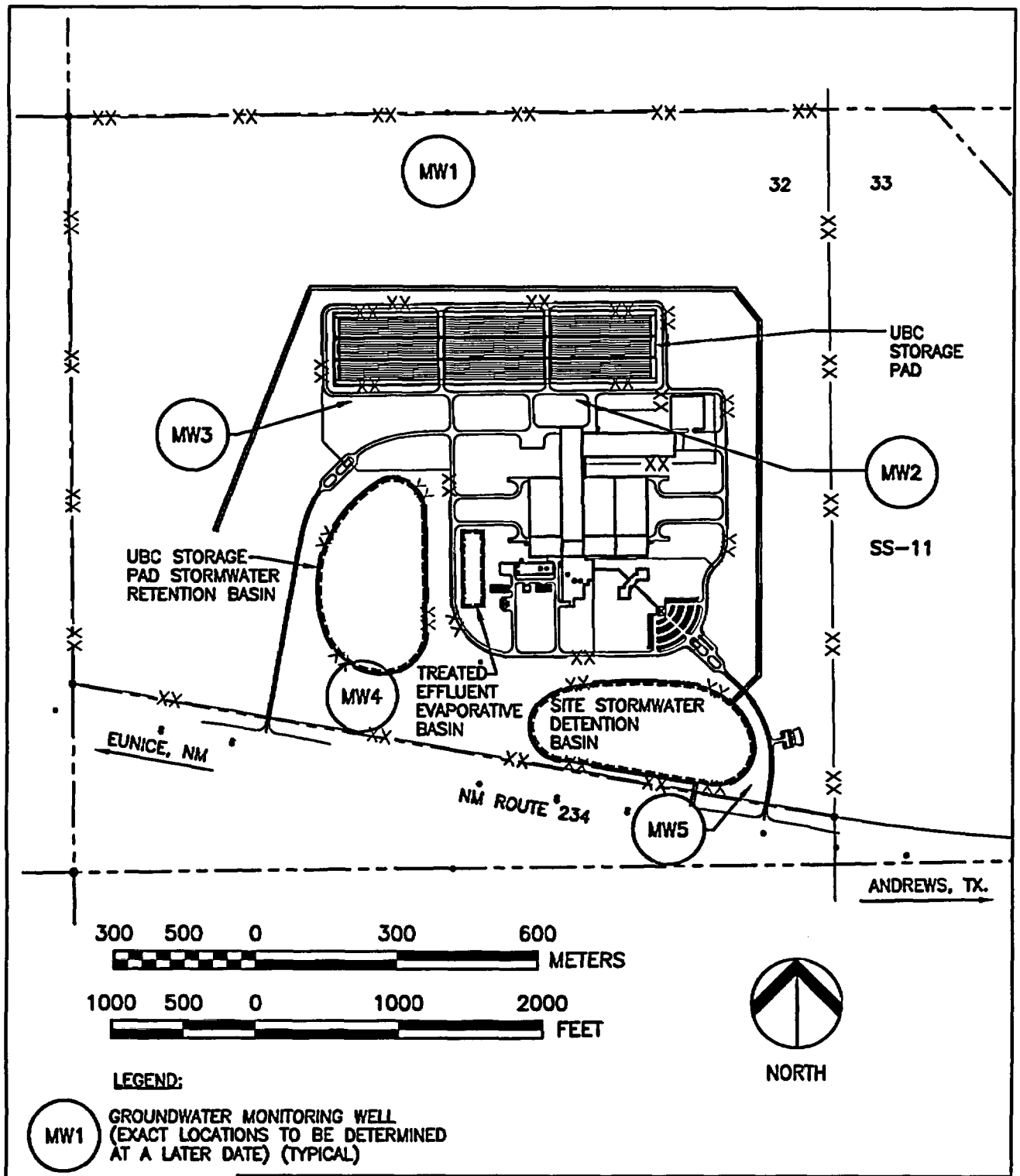


FIGURE ER RAI 6-1C	GROUNDWATER MONITORING WELL LOCATIONS
DATE: 5/20/04	

FRAMATOME ANP

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Lockwood Greene
Attention Carl Jackson

Report Date 10/30/03
Receipt Date 10/22/03

Lockwood Greene
PO Box 491 (29304)
1500 International Drive
Spartanburg, SC 29303

Lab. Sample No. L6383-01 Client ID LES MWZ Product GAMMA SPECTROMETRY
Reference Date 10/19/03 Analysis Date 10/29/03 Matrix Ground Water

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/L)			TPU 1 Sigma (pCi/L)	Measured MDC (pCi/L)	Required MDC (pCi/L)	Flags
Ag-108m	-1.2E+00	+/-	1.2E+00	1.2E+00	4.6E+00		
Ag-110m	-6E-01	+/-	2.1E+00	2.1E+00	8.4E+00		
Ba-140	2.5E+00	+/-	2.3E+00	2.3E+00	8.3E+00		
Be-7	6E+00	+/-	1.1E+01	1.1E+01	4.1E+01		
Ce-141	3.3E+00	+/-	2.5E+00	2.5E+00	8.2E+00		
Ce-144	-3.3E+00	+/-	8.3E+00	8.3E+00	2.9E+01		
Co-57	1E+00	+/-	1.2E+00	1.2E+00	3.9E+00		
Co-58	-1E-01	+/-	1.4E+00	1.4E+00	5.4E+00		
Co-60	1E-01	+/-	1.4E+00	1.4E+00	5.6E+00		
Cr-51	-3.4E+01	+/-	1.1E+01	1.2E+01	4.9E+01		
Cs-134	6E-01	+/-	1.7E+00	1.7E+00	6.4E+00		
Cs-137	8E-01	+/-	1.1E+00	1.1E+00	4.1E+00		
Fe-59	1.1E+00	+/-	4.1E+00	4.1E+00	1.6E+01		
I-131	1.7E+00	+/-	2.7E+00	2.7E+00	9.5E+00		
K-40	4.4E+01	+/-	2.6E+01	2.5E+01	7.9E+01		
La-140	2.9E+00	+/-	2.7E+00	2.7E+00	9.5E+00		
Mn-54	1E-01	+/-	1.4E+00	1.4E+00	5.3E+00		
Nb-95	-7E-01	+/-	1.7E+00	1.7E+00	6.6E+00		
Ra-228	5.9E+00	+/-	5.2E+00	5.2E+00	1.8E+01	2.0E+01	
Ru-103	-1.2E+00	+/-	1.5E+00	1.5E+00	5.9E+00		
Ru-106	9E+00	+/-	1.3E+01	1.3E+01	4.6E+01		
Sb-124	-5.8E+00	+/-	4.0E+00	4.0E+00	1.9E+01		
Sb-125	-2.7E+00	+/-	3.7E+00	3.7E+00	1.4E+01		
Se-75	-1E-01	+/-	1.5E+00	1.5E+00	5.6E+00		
Zn-65	-1.4E+00	+/-	2.6E+00	2.6E+00	1.1E+01	3.0E+01	
Zr-95	-1.5E+00	+/-	2.6E+00	2.6E+00	1.0E+01	1.5E+01	

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c: Ed Maher

MAILED
OCT 31 2003
FRAMATOME ANP
ENVIRONMENTAL LAB

Approved by
10/31/03
J. M. Raimondi
Sample Control Manager

FRAMATOME ANP

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-698-9970

Customer
Lockwood Greene
PO Box 491 (29304)
1500 International Drive
Spartanburg, SC 29303
Attn: Carl Jackson

Product GROSS AB

Report Date 11/06/03
Receipt Date 10/22/03

LSN	Client ID & Description	Reference Date	Analysis Date	Nuclide	Activity Concentration +/- 1-Sigma (pCi/L)	TPU 1 Sigma (pCi/L)	Measured MDC (pCi/L)	Required MDC (pCi/L)	Flags	Reporting Level Ratio
Ground Water										
L6383-01	LES MWZ	10/19/2003	11/05/2003	GROSS ALPHA	1.51E+01 +/- 4.6E+00	4.8E+00	1.4E+01	1.5E+01	b	
L6383-01	LES MWZ	10/19/2003	11/05/2003	GROSS BETA	3.14E+01 +/- 2.8E+00	3.2E+00	8.0E+00	4.0E+00	ab	

Flags:
a The measured MDC is greater than the required MDC.
b The activity concentration is greater than three times its one sigma counting uncertainty.

Approved by
11/06/03
J. M. Raimondi
Sample Control Manager

c: Ed Maher

MAILED
NOV 0 6 2003
FRAMATOME ANP
ENVIRONMENTAL LAB

FRAMATOME ANP

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer
Lockwood Greene
PO Box 491 (29304)
1500 International Drive
Spartanburg, SC 29303
Attn: Carl Jackson

Product RA-226 (A)

Report Date 11/05/03
Receipt Date 10/22/03

LSN	Client ID & Description	Reference Date	Analysis Date	Nuclide	Activity Concentration +/- 1-Sigma (pCi/L)	TPU 1 Sigma (pCi/L)	Measured MDC (pCi/L)	Required MDC (pCi/L)	Flags	Reporting Level Ratio
Ground Water										
L6383-01	LES MWZ	10/19/2003	11/03/2003	Ra-224	-1.35E+00 +/- 9.6E-01	9.6E-01	1.3E+02			
L6383-01	LES MWZ	10/19/2003	11/03/2003	Ra-226	6.5E+00 +/- 3.8E+00	3.8E+00	6.8E+00	2.0E+01		

Flags:
a The measured MDC is greater than the required MDC.
b The activity concentration is greater than three times its one sigma counting uncertainty.

Approved by
11/05/03
J. M. Raimondi
Sample Control Manager

c: Ed Maher

MAILED
NOV 0 5 2003
FRAMATOME ANP
ENVIRONMENTAL LAB

FRAMATOME ANP

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer
Lockwood Greene
PO Box 491 (29304)
1500 International Drive
Spartanburg, SC 29303
Attn: Carl Jackson

Product U-234, U-235, U-238

Report Date 11/05/03
Receipt Date 10/22/03

LSN	Client ID & Description	Reference Date	Analysis Date	Nuclide	Activity Concentration +/- 1-Sigma (pCi/L)	TPU 1 Sigma (pCi/L)	Measured MDC (pCi/L)	Required MDC (pCi/L)	Flags	Reporting Level Ratio
Ground Water										
L6383-01	LES MWZ	10/19/2003	11/04/2003	U-234	4.75E+00 +/- 4.5E-01	4.9E-01	1.8E-01	5.0E+00	b	
L6383-01	LES MWZ	10/19/2003	11/04/2003	U-235	1.58E-01 +/- 9.1E-02	9.2E-02	1.4E-01	5.0E+00		
L6383-01	LES MWZ	10/19/2003	11/04/2003	U-238	1.06E+00 +/- 2.1E-01	2.2E-01	2.1E-01	5.0E+00	b	

Flags:
a The measured MDC is greater than the required MDC.
b The activity concentration is greater than three times its one sigma counting uncertainty.

Approved by
11/05/03
J. M. Raimondi
Sample Control Manager

c: Ed Maher

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NOV 0 5 2003
FRAMATOME ANP
ENVIRONMENTAL LAB

FRAMATOME ANP

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Lockwood Greene
Attention Carl Jackson

Report Date 11/26/03
Receipt Date 11/14/03

Lockwood Greene
PO Box 491 (29304)
1500 International Drive
Spartanburg, SC 29303

Lab. Sample No. L6506-01 Client ID LES MWZ Product GAMMA SPECTROMETRY
Reference Date 11/12/03 Analysis Date 11/25/03 Matrix Ground Water

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/L)			TPU 1 Sigma (pCi/L)	Measured MDC (pCi/L)	Required MDC (pCi/L)	Flags
Ag-108m	-4.4E-01	+/-	8.5E-01	8.5E-01	3.2E+00		
Ag-110m	-1.4E+00	+/-	1.3E+00	1.3E+00	5.2E+00		
Ba-140	-1.3E+00	+/-	1.8E+00	1.8E+00	7.7E+00		
Be-7	-1.93E+01	+/-	9.2E+00	9.2E+00	3.7E+01		
Ce-141	1.5E+00	+/-	2.8E+00	2.8E+00	9.5E+00		
Ce-144	5.2E+00	+/-	7.2E+00	7.2E+00	2.4E+01		
Co-57	2.3E-01	+/-	9.2E-01	9.2E-01	3.2E+00		
Co-58	-2.6E+00	+/-	1.1E+00	1.1E+00	4.8E+00		
Co-60	-1.1E+00	+/-	1.1E+00	1.1E+00	4.6E+00		
Cr-51	-1.8E+01	+/-	1.1E+01	1.1E+01	4.2E+01		
Cs-134	0E+00	+/-	1.1E+00	1.1E+00	4.2E+00		
Cs-137	8E-01	+/-	1.0E+00	1.0E+00	3.6E+00		
Fe-59	-1.1E+00	+/-	2.4E+00	2.4E+00	1.0E+01		
I-131	3.6E+00	+/-	2.8E+00	2.8E+00	9.4E+00		
K-40	-2E+00	+/-	1.5E+01	1.5E+01	5.5E+01		
La-140	-1.5E+00	+/-	2.1E+00	2.1E+00	8.8E+00		
Mn-54	0E+00	+/-	1.0E+00	1.0E+00	3.8E+00		
Nb-95	-2E-01	+/-	1.2E+00	1.2E+00	4.6E+00		
Ru-103	-1.8E+00	+/-	1.3E+00	1.3E+00	5.0E+00		
Ru-106	-2.3E+01	+/-	1.1E+01	1.1E+01	4.3E+01		
Sb-124	-1.2E+00	+/-	2.5E+00	2.5E+00	1.0E+01		
Sb-125	-2.4E+00	+/-	3.2E+00	3.2E+00	1.2E+01		
Se-75	1E-01	+/-	1.5E+00	1.5E+00	5.2E+00		
Zn-65	-1.4E+00	+/-	2.6E+00	2.6E+00	1.0E+01	3.0E+01	
Zr-95	0E+00	+/-	2.0E+00	2.0E+00	7.3E+00	1.5E+01	

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c: Ed Maher

Approved by
12/02/03
J. M. Raimondi
Sample Control Manager

DEC 03 2003

FRAMATOME ANP

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer
Lockwood Greene
PO Box 491 (29304)
1500 International Drive
Spartanburg, SC 29303
Attn: Carl Jackson

Product RA-226 (A)

Report Date 12/23/03
Receipt Date 11/14/03

LSN	Client ID & Description	Reference Date	Analysis Date	Nuclide	Activity Concentration +/- 1-Sigma (pCi/L)	TPU 1 Sigma (pCi/L)	Measured MDC (pCi/L)	Required MDC (pCi/L)	Flags	Reporting Level Ratio
Ground Water										
L6506-01	LES MWZ	11/12/2003	12/23/2003	Ra-226	1.29E+00 +/- 2.7E-01	2.8E-01	1.6E-01	2.0E+01	b	

Flags: a The measured MDC is greater than the required MDC.
b The activity concentration is greater than three times its one sigma counting uncertainty.

Approved by
12/23/03
J. M. Raimondi
Sample Control Manager

c: Ed Maher

DEC 2 9 2003

FRAMATOME ANP

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer
Lockwood Greene
PO Box 491 (29304)
1500 International Drive
Spartanburg, SC 29303
Attn: Carl Jackson

Product U-234, U-235, U-238

Report Date 12/23/03
Receipt Date 11/14/03

LSN	Client ID & Description	Reference Date	Analysis Date	Nuclide	Activity Concentration +/- 1-Sigma (pCi/L)	TPU 1 Sigma (pCi/L)	Measured MDC (pCi/L)	Required MDC (pCi/L)	Flags	Reporting Level Ratio
Ground Water										
L6506-01	LES MWZ	11/12/2003	12/23/2003	U-234	4.43E+00 +/- 2.5E-01	4.3E-01	5.9E-02	5.0E+00	b	
L6506-01	LES MWZ	11/12/2003	12/23/2003	U-235	8.5E-02 +/- 4.0E-02	4.0E-02	7.3E-02	5.0E+00		
L6506-01	LES MWZ	11/12/2003	12/23/2003	U-238	1.2E+00 +/- 1.3E-01	1.6E-01	6.3E-02	5.0E+00	b	

Flags:
a The measured MDC is greater than the required MDC.
b The activity concentration is greater than three times its one sigma counting uncertainty.

Approved by
12/23/03
J. M. Raimondi
Sample Control Manager

c: Ed Maher

FRAMATOME ANP

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer
Lockwood Greene
PO Box 491 (29304)
1500 International Drive
Spartanburg, SC 29303
Attn: Carl Jackson

Product GROSS AB

Report Date 12/18/03
Receipt Date 11/14/03

LSN	Client ID & Description	Reference Date	Analysis Date	Nuclide	Activity Concentration +/- 1-Sigma (pCi/L)	TPU 1 Sigma (pCi/L)	Measured MDC (pCi/L)	Required MDC (pCi/L)	Flags	Reporting Level Ratio
Ground Water										
L6506-01	LES MWZ	11/12/2003	12/15/2003	GROSS ALPHA	9.7E+00 +/- 4.6E+00	4.7E+00	1.5E+01	1.5E+01		
L6506-01	LES MWZ	11/12/2003	12/15/2003	GROSS BETA	3.35E+01 +/- 2.6E+00	3.1E+00	7.6E+00	4.0E+00	ab	

Flags:
a The measured MDC is greater than the required MDC.
b The activity concentration is greater than three times its one sigma counting uncertainty.

Approved by
12/18/03
J. M. Raimondi
Sample Control Manager

c: Ed Maher

DEC 19 2003

AREVA

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Lockwood Greene
Attention Carl Jackson

Report Date 04/27/04
Receipt Date 03/31/04

Lockwood Greene
1500 International Drive

Spartanburg, SC 29304

Lab. Sample No. L7134-01 Client ID LES MWZ Product GAMMA SPECTROMETRY
Reference Date 03/29/04 Analysis Date 04/27/04 Matrix Ground Water

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/L)			TPU 1 Sigma (pCi/L)	Measured MDC (pCi/L)	Required MDC (pCi/L)	Flags
Ag-108m	0E+00	+/-	9.2E-01	9.2E-01	3.3E+00		
Ag-110m	0E+00	+/-	1.4E+00	1.4E+00	5.2E+00		
Ba-140	9E-01	+/-	4.7E+00	4.7E+00	1.8E+01		
Be-7	-3E+01	+/-	1.4E+01	1.4E+01	5.3E+01		
Ce-141	-2.5E+00	+/-	3.3E+00	3.3E+00	1.2E+01		
Ce-144	6.7E+00	+/-	7.7E+00	7.7E+00	2.6E+01		
Co-57	1.6E+00	+/-	1.0E+00	1.0E+00	3.3E+00		
Co-58	-1.1E+00	+/-	1.3E+00	1.3E+00	4.9E+00		
Co-60	5E-01	+/-	1.0E+00	1.0E+00	3.8E+00		
Cr-51	-1.2E+01	+/-	1.9E+01	1.9E+01	6.7E+01		
Cs-134	-9E-01	+/-	1.1E+00	1.1E+00	4.2E+00		
Cs-137	-8E-01	+/-	1.1E+00	1.1E+00	4.3E+00		
Fe-59	-5E-01	+/-	3.9E+00	3.9E+00	1.5E+01		
I-131	0E+00	+/-	1.3E+01	1.3E+01	4.4E+01		
K-40	3.8E+01	+/-	1.7E+01	1.7E+01	5.2E+01		c
La-140	1.1E+00	+/-	5.5E+00	5.5E+00	2.1E+01		
Mn-54	-3E-01	+/-	1.1E+00	1.1E+00	4.1E+00		
Nb-95	6.1E+00	+/-	2.6E+00	2.7E+00	8.4E+00		
Ra-228	2.6E+00	+/-	4.1E+00	4.1E+00	1.4E+01	2.0E+01	
Ru-103	-1.6E+00	+/-	1.9E+00	1.9E+00	7.1E+00		
Ru-106	-2E+00	+/-	1.0E+01	1.0E+01	3.7E+01		
Sb-124	5.2E+00	+/-	3.2E+00	3.2E+00	1.0E+01		
Sb-125	3.7E+00	+/-	2.7E+00	2.7E+00	9.0E+00		
Se-75	1.8E+00	+/-	1.8E+00	1.8E+00	6.0E+00		
Zn-65	-2.1E+00	+/-	5.2E+00	5.2E+00	1.8E+01	3.0E+01	
Zr-95	-2.3E+00	+/-	2.3E+00	2.3E+00	8.8E+00	1.5E+01	

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c: George Harper

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APR 2 8 2004
FRAMATOME ANP
ENVIRONMENTAL LAB

Approved by
4/28/04
J. M.Raimondi
Laboratory Manager

AREVA

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer
Lockwood Greene
1500 International Drive
Spartanburg, SC 29304
Attn: Carl Jackson

Product GROSS AB

Report Date 04/28/04
Receipt Date 03/31/04

LSN	Client ID & Description	Reference Date	Analysis Date	Nuclide	Activity Concentration +/- 1-Sigma (pCi/L)	TPU 1 Sigma (pCi/L)	Measured MDC (pCi/L)	Required MDC (pCi/L)	Flags	Reporting Level Ratio
Ground Water										
L7134-01	LES MWZ	03/29/2004	04/27/2004	GROSS ALPHA	2.71E+01 +/- 5.9E+00	6.3E+00	1.5E+01	1.5E+01	b	
L7134-01	LES MWZ	03/29/2004	04/27/2004	GROSS BETA	3.75E+01 +/- 3.9E+00	4.4E+00	1.1E+01	4.0E+00	ab	

Flags:
a The measured MDC is greater than the required MDC.
b The activity concentration is greater than three times its one sigma counting uncertainty.

Approved by
4/28/04
J. M. Raimondi
Laboratory Manager

c: George Harper

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APR 28 2004
FRAMATOME ANP
ENVIRONMENTAL LAB

AREVA

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer
Lockwood Greene
1500 International Drive
Spartanburg, SC 29304
Attn: Carl Jackson

Product RA-226 (A)

Report Date 05/03/04
Receipt Date 03/31/04

LSN	Client ID & Description	Reference Date	Analysis Date	Nuclide	Activity Concentration +/- 1-Sigma (pCi/L)	TPU 1 Sigma (pCi/L)	Measured MDC (pCi/L)	Required MDC (pCi/L)	Flags	Reporting Level Ratio
Ground Water										
L7134-01	LES MWZ	03/29/2004	04/30/2004	Ra-226	1.21E+00 +/- 1.1E-01	1.5E-01	6.7E-02	2.0E+01	b	

Flags:
a The measured MDC is greater than the required MDC.
b The activity concentration is greater than three times its one sigma counting uncertainty.

Approved by
5/03/04
J. M. Raimondi
Laboratory Manager

c: George Harper

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MAY 0 3 2004
FRAMATOME ANP
ENVIRONMENTAL LAB

AREVA

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer
Lockwood Greene
PO Box 491 (29304)
1500 International Drive
Spartanburg, SC 29304
Attn: Carl Jackson

Product U-234, U-235, U-238

Report Date 04/27/04
Receipt Date 03/31/04

LSN	Client ID & Description	Reference Date	Analysis Date	Nuclide	Activity Concentration +/- 1-Sigma (pCi/L)	TPU 1 Sigma (pCi/L)	Measured MDC (pCi/L)	Required MDC (pCi/L)	Flags	Reporting Level Ratio
Ground Water										
L7134-01	LES MWZ	03/29/2004	04/21/2004	U-234	6.401E+00 +/- 5.0E-02	2.2E-01	4.1E-03	5.0E+00	b	
L7134-01	LES MWZ	03/29/2004	04/21/2004	U-235	1.312E-01 +/- 8.0E-03	9.1E-03	5.1E-03	5.0E+00	b	
L7134-01	LES MWZ	03/29/2004	04/21/2004	U-238	2.637E+00 +/- 3.2E-02	9.5E-02	4.1E-03	5.0E+00	b	

Flags:
a The measured MDC is greater than the required MDC.
b The activity concentration is greater than three times its one sigma counting uncertainty.

Approved by
4/27/04
J. M. Raimondi
Laboratory Manager

c: George Harper

MAILED
APR 27 2004
FRAMATOME ANP
ENVIRONMENTAL LAB

ATTACHMENT 4

Louisiana Energy Services
Response to April 29, 2004,
Requests for Additional Information

Letter Dated March 12, 2004, from J. Mace (US Army Corps of Engineers)
to G. Harper (Framatome-ANP)
Regarding the Absence of Corps of Engineers' Jurisdictional Waters on the NEF Site

DEPARTMENT OF THE ARMY
ALBUQUERQUE DISTRICT, CORPS OF ENGINEERS
EL PASO REGULATORY OFFICE
PO BOX 6096
FORT BLISS TX 79906-0096

March 17, 2004

Operations Division
Regulatory Branch

George Harper
FRAMATONE ANP, INC.
Solomon Pond Park, 400 Donald Lynch Blvd
Marlborough, MA 01752

Dear Mr. Harper:

This replies to the March 15, 2004, field inspection that I conducted with you and Denise Gallegos regarding the proposed National Enrichment Facility in Eunice, Lea County, New Mexico. We have assigned Action No. 2004 00170 to this activity. The proposed construction site is located in Section 32, Range 38 East, Township 21 South.

We have evaluated the information you provided and studied the project description, other records, and documents available to us. Additionally, as referenced, I visited the site on March 15, 2004. We concur with your findings that no waters of the United States are located within the project site and that there are no Corps of Engineers' jurisdictional waters on the site. Therefore, the project is not regulated under the provisions of Section 404 of the Clean Water Act and a Department of the Army permit will not be required.

Our disclaimer of jurisdiction is only for Section 404 of the Federal Clean Water Act. Other Federal, state and local laws may apply to the activities. Therefore, you should also contact other Federal, state and local regulatory authorities to determine whether the activities may require other authorizations or permits.

This jurisdictional determination will be valid for 5 years from the date of this letter unless new information warrants revision of the determination within that time.

If you have any questions, please feel free to contact me at (915) 568-1359 or e-mail me at james.e.mace@usace.army.mil. For

more information about the regulatory program, please see our web site at www.spa.usace.army.mil/reg.

Sincerely,

James E. Mace
Chief, El Paso Regulatory Office

Copies furnished:

El Paso
NMED

ATTACHMENT 5

Louisiana Energy Services
Response to April 29, 2004,
Requests for Additional Information

Letter Dated April 13, 2004, from R. Krich (Louisiana Energy Services, L.P.)
to J. Parker (New Mexico Environment Department)
Regarding "Registration of X-Ray Radiation Machines for the National Enrichment Facility"

NATIONAL
ENRICHMENT
FACILITY

April 13, 2004

Mr. John Parker, Chief
Radiation Control Bureau
Field Operations Division
New Mexico Environment Department
1190 St. Francis Drive, S2100
P.O. Box 26110
Santa Fe, New Mexico 87502-6110

Subject: Registration of X-Ray Radiation Machines for the National Enrichment Facility

As you are aware, Louisiana Energy Services (LES), L.P. is proposing to construct and operate the National Enrichment Facility (NEF) in Lea County, New Mexico. It is anticipated that the NEF will have one or more x-ray radiation machines used by access security to screen packages and personnel articles entering the secure areas of the plant. Other radiation machines will be used to x-ray certain equipment after assembly.

Although the number and types of x-ray radiation machines that will be required will not be known for several years, the purpose of this letter is to provide your office with advanced notification that LES may be submitting x-ray radiation machine registration applications in accordance with 20.3.2 NMAC (Form NMED 022). As outlined in 20.3.2 NMAC, LES will submit the x-ray radiation machine registrations only if the x-ray radiation machines exceed the exempt specification provided in 20.3.2 NMAC.

Please contact me if you have any questions regarding this matter. I can be reached at (630) 657-2813.

Respectfully,

R. M. Krich
Vice President - Licensing, Safety and Nuclear Engineering

One Sun Plaza 100 Sun Lane NE, Suite 204 Albuquerque, NM 87109 [P] 505 944 0194 [F] 505 944 019

ATTACHMENT 6

Louisiana Energy Services
Response to April 29, 2004,
Requests for Additional Information

Documentation Supplied in Response to Requests

The following documents are provided in this attachment in response to requests contained in RAI 3-4B, RAI 3-4C, and RAI 4-11:

- Atomic Vapor Laser Isotope Separation (AVLIS), New Mexico, Technical Appendices, submitted by the State of New Mexico and Waste Control Specialists, LLC.
- Evaluation of Potential Groundwater Impacts by the WCS Facility in Andrews County, Texas, Prepared for Andrews Industrial Foundation, K. Rainwater, December 1996.
- Geology of the WCS-Flying W Ranch, Andrews County, Texas, Prepared for Andrews Industrial Foundation, Texas Tech University Water Resources Center, April 2000.
- Groundwater Non-radiological Analytical Report for Monitoring Well MW-2, First Sampling Event, analyzed by Severn Trent Laboratory, November 19, 2003.
- Groundwater Non-radiological Analytical Report for Monitoring Well MW-2, Second Sampling Event, analyzed by Severn Trent Laboratory, December 22, 2003.
- Groundwater Non-radiological Analytical Report for Monitoring Well MW-2, Third Sampling Event, analyzed by Severn Trent Laboratory, May 6, 2004.
- Groundwater Radiological Analytical Report for Monitoring Well MW-2, First Sampling Event, analyzed by Framatome ANP Environmental Laboratory, October 30, 2003.
- Groundwater Radiological Analytical Report for Monitoring Well MW-2, Second Sampling Event, analyzed by Framatome ANP Environmental Laboratory, November 26, 2003.
- Groundwater Radiological Analytical Report for Monitoring Well MW-2, Third Sampling Event, analyzed by Framatome ANP Environmental Laboratory, April 27, 2004.
- Hydrogeologic Investigation, Section 32; Township 21 Range 38, Eunice, New Mexico, prepared for Lockwood Greene Engineering & Construction, prepared by Cook-Joyce, Inc., November 19, 2003.
- Lesser Prairie-Chicken (Tympanuchus pallidicinctus), Area of Critical Environmental Concern (ACEC), A Petition to the New Mexico BLM, by Ken Stinnett.
- Lesser Prairie-Chicken Surveys on the National Enrichment Facility Proposed Project Site, Eagle Environmental, Inc., May 2004
- RCRA Permit Application for a Hazardous Waste Storage, Treatment and Disposal Facility, Andrews County, Texas, Section VI, Geology Report, prepared for Waste Control Specialists, Inc., prepared by Terra Dynamics Incorporated, March 1993.
- Report of Preliminary Subsurface Exploration, Proposed National Enrichment Facility, Lea County, New Mexico, prepared for Lockwood Greene, prepared by MACTEC Engineering and Consulting, Inc., October 17, 2003.
- Soil Radiological Analytical Report, First Sampling Event, analyzed by Framatome ANP Environmental Laboratory, November 5, 2003.

- Soil Radiological Analytical Report, Second Sampling Event, analyzed by Framatome ANP Environmental Laboratory, April 27, 2004.

- Soil Non-Radiological Analytical Report, Second Sampling Event, analyzed by Severn Trent Laboratory, April 29, 2004.

- Waste Control Specialists, 2002 Annual Groundwater Monitoring Report, prepared for Waste Control Specialists, LLC, prepared by Cook-Joyce, Inc., January 25, 2003.

- Waste Control Specialists, Section VI, Geology Report, prepared for Waste Control Specialists, prepared by Cook-Joyce, Inc. and Intera, Inc., February 2004. (Includes main body of report, all tables, Figures 6.0-1 through 6.4-17 and Plates 6.2-2 and 6.2-3)

FRAMATOME ANP

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer
Lockwood Greene

Product U-234, U-235, U-238

Report Date 11/05/03
Receipt Date 09/23/03

Attn: Ed Maher

LSN	Client ID & Description	Reference Date	Analysis Date	Nuclide	Activity Concentration +/- 1-Sigma (pCi/kg)	TPU 1 Sigma (pCi/kg)	Measured MDC (pCi/kg)	Required MDC (pCi/kg)	Flags	Reporting Level Ratio
Soil										
L6268-01	SOIL#1	09/17/2003	10/31/2003	U-234	2.1E+02 +/- 3.9E+01	4.1E+01	2.8E+01	1.0E+03	b	
L6268-01	SOIL#1	09/17/2003	10/31/2003	U-235	3.5E+01 +/- 1.8E+01	1.8E+01	3.4E+01	1.0E+03		
L6268-01	SOIL#1	09/17/2003	10/31/2003	U-238	2.47E+02 +/- 4.2E+01	4.5E+01	2.5E+01	1.0E+03	b	
L6268-02	SOIL#2	09/17/2003	10/31/2003	U-234	2.42E+02 +/- 3.8E+01	4.1E+01	2.3E+01	1.0E+03	b	
L6268-02	SOIL#2	09/17/2003	10/31/2003	U-235	3E+01 +/- 1.5E+01	1.5E+01	2.0E+01	1.0E+03		
L6268-02	SOIL#2	09/17/2003	10/31/2003	U-238	1.92E+02 +/- 3.4E+01	3.6E+01	2.9E+01	1.0E+03	b	
L6268-03	SOIL#3	09/17/2003	10/31/2003	U-234	1.8E+02 +/- 3.3E+01	3.5E+01	2.2E+01	1.0E+03	b	
L6268-03	SOIL#3	09/17/2003	10/31/2003	U-235	3.8E+01 +/- 1.7E+01	1.7E+01	2.7E+01	1.0E+03		
L6268-03	SOIL#3	09/17/2003	10/31/2003	U-238	2.11E+02 +/- 3.6E+01	3.8E+01	2.4E+01	1.0E+03	b	
L6268-04	SOIL#4	09/17/2003	10/31/2003	U-234	1.82E+02 +/- 3.7E+01	3.9E+01	3.7E+01	1.0E+03	b	
L6268-04	SOIL#4	09/17/2003	10/31/2003	U-235	4.5E+01 +/- 2.0E+01	2.1E+01	3.5E+01	1.0E+03		
L6268-04	SOIL#4	09/17/2003	10/31/2003	U-238	1.84E+02 +/- 3.7E+01	3.9E+01	3.1E+01	1.0E+03	b	
L6268-05	SOIL#5	09/17/2003	10/31/2003	U-234	1.56E+02 +/- 3.1E+01	3.3E+01	2.7E+01	1.0E+03	b	
L6268-05	SOIL#5	09/17/2003	10/31/2003	U-235	2.2E+01 +/- 1.3E+01	1.3E+01	2.9E+01	1.0E+03		
L6268-05	SOIL#5	09/17/2003	10/31/2003	U-238	1.56E+02 +/- 3.1E+01	3.3E+01	2.8E+01	1.0E+03	b	

Flags:
a The measured MDC is greater than the required MDC.
b The activity concentration is greater than three times its one sigma counting uncertainty.

MAILED
NOV 0 6 2003
FRAMATOME ANP
ENVIRONMENTAL LAB

Approved by
11/05/03
J. M. Raimondi
Sample Control Manager

c:

FRAMATOME ANP

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer
Lockwood Greene

Product U-234, U-235, U-238

Report Date 11/05/03
Receipt Date 09/23/03

Attn: Ed Maher

LSN	Client ID & Description	Reference Date	Analysis Date	Nuclide	Activity Concentration +/- 1-Sigma (pCi/kg)	TPU 1 Sigma (pCi/kg)	Measured MDC (pCi/kg)	Required MDC (pCi/kg)	Flags	Reporting Level Ratio
Soil										
L6268-06	SOIL#6	09/17/2003	10/31/2003	U-234	1.79E+02 +/- 3.5E+01	3.7E+01	1.9E+01	1.0E+03	b	
L6268-06	SOIL#6	09/17/2003	10/31/2003	U-235	1.7E+01 +/- 1.2E+01	1.2E+01	2.3E+01	1.0E+03		
L6268-06	SOIL#6	09/17/2003	10/31/2003	U-238	1.44E+02 +/- 3.2E+01	3.3E+01	2.4E+01	1.0E+03	b	
L6268-07	SOIL#7	09/17/2003	10/31/2003	U-234	2.69E+02 +/- 4.6E+01	4.8E+01	2.7E+01	1.0E+03	b	
L6268-07	SOIL#7	09/17/2003	10/31/2003	U-235	1.9E+01 +/- 1.3E+01	1.3E+01	2.6E+01	1.0E+03		
L6268-07	SOIL#7	09/17/2003	10/31/2003	U-238	2.44E+02 +/- 4.4E+01	4.6E+01	3.3E+01	1.0E+03	b	
L6268-08	SOIL#8	09/17/2003	10/31/2003	U-234	1.84E+02 +/- 3.6E+01	3.7E+01	3.0E+01	1.0E+03	b	
L6268-08	SOIL#8	09/17/2003	10/31/2003	U-235	8E+00 +/- 8.5E+00	8.5E+00	3.0E+01	1.0E+03		
L6268-08	SOIL#8	09/17/2003	10/31/2003	U-238	2.4E+02 +/- 4.1E+01	4.3E+01	2.8E+01	1.0E+03	b	
L6268-09	SOIL#9	09/17/2003	10/31/2003	U-234	1.86E+02 +/- 3.8E+01	4.0E+01	2.7E+01	1.0E+03	b	
L6268-09	SOIL#9	09/17/2003	10/31/2003	U-235	2.7E+01 +/- 1.7E+01	1.7E+01	4.1E-01	1.0E+03		
L6268-09	SOIL#9	09/17/2003	10/31/2003	U-238	2.1E+02 +/- 4.0E+01	4.2E+01	2.7E+01	1.0E+03	b	
L6268-10	SOIL#10	09/17/2003	10/31/2003	U-234	1.69E+02 +/- 3.7E+01	3.8E+01	2.8E+01	1.0E+03	b	
L6268-10	SOIL#10	09/17/2003	10/31/2003	U-235	9E+00 +/- 1.0E+01	1.0E+01	3.5E+01	1.0E+03		
L6268-10	SOIL#10	09/17/2003	10/31/2003	U-238	2.18E+02 +/- 4.2E+01	4.4E+01	2.2E+01	1.0E-03	b	

Flags:
a The measured MDC is greater than the required MDC.
b The activity concentration is greater than three times its one sigma counting uncertainty.

MAILED
NOV 0 6 2003
FRAMATOME ANP
ENVIRONMENTAL LAB

Approved by
11/05/03
J. M. Raimondi
Sample Control Manager

c:

FRAMATOME ANP

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Lockwood Greene

Customer Lockwood Greene
Attention Ed Maher

Report Date 11/05/03
Receipt Date 09/23/03

Lab. Sample No. L6268-01 Client ID SOIL#1 Product GAMMA SPECTROMETRY
Reference Date 09/17/03 Analysis Date 10/22/03 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/kg)			TPU 1 Sigma (pCi/kg)	Measured MDC (pCi/kg)	Required MDC (pCi/kg)	Flags
AcTh-228	1.69E+02	+/-	1.6E+01	1.8E+01	5.3E+01		bc
Ag-108m	3E+00	+/-	3.2E+00	3.2E+00	1.1E+01		
Ag-110m	-5.2E+00	+/-	5.1E+00	5.1E+00	2.0E+01		
Am-241	-1.9E+01	+/-	2.2E+01	2.2E+01	7.5E+01		
Ba-140	-5.7E+01	+/-	7.2E+01	7.2E+01	2.7E+02		
Be-7	3.9E+01	+/-	4.0E+01	4.0E+01	1.4E+02		
Ce-141	4E+00	+/-	1.2E+01	1.2E+01	4.1E+01		
Ce-144	1.1E+01	+/-	3.0E+01	3.0E+01	1.0E+02		
Co-57	8E-01	+/-	3.6E+00	3.6E+00	1.2E+01		
Co-58	-4E+00	+/-	4.5E+00	4.5E+00	1.7E+01		
Co-60	-1.8E+00	+/-	3.4E+00	3.4E+00	1.3E+01	1.5E+02	
Cr-51	-1.9E+01	+/-	7.2E+01	7.2E+01	2.5E+02		
Cs-134	7E+00	+/-	1.5E+01	1.5E+01	4.9E+01	1.5E+02	
Cs-137	3.02E+01	+/-	5.2E+00	5.4E+00	1.4E+01	1.5E+02	bc
Fe-59	-9E+00	+/-	1.3E+01	1.3E+01	4.9E+01		
I-131	4.6E+01	+/-	7.5E+01	7.6E+01	2.6E+02		
K-40	3.99E+03	+/-	1.6E+02	2.5E+02	1.3E+02		bc
La-140	5.8E+01	+/-	4.4E+01	4.4E+01	1.5E+02		
Mn-54	4E+00	+/-	3.9E+00	3.9E+00	1.3E+01		
Nb-95	4E+00	+/-	1.0E+01	1.0E+01	3.6E+01		
Ru-103	4.2E+00	+/-	5.1E+00	5.1E+00	1.8E+01		
Ru-106	7E+00	+/-	3.5E+01	3.5E+01	1.2E+02		
Sb-124	7.2E+00	+/-	8.8E+00	8.8E+00	3.2E+01		
Sb-125	0E+00	+/-	1.0E+01	1.0E+01	3.7E+01		
Se-75	4E-01	+/-	5.4E+00	5.4E+00	1.9E+01		
Zn-65	-2.1E+01	+/-	1.7E+01	1.7E+01	6.1E+01		
Zr-95	-1.9E+01	+/-	1.4E+01	1.4E+01	5.6E+01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Approved by
11/05/03
J. M. Raimondi
Sample Control Manager

Reporting Level Ratio:

c:

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NOV 05 2003
FRAMATOME ANP
ENVIRONMENTAL LAB

FRAMATOME ANP

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Lockwood Greene
Attention Ed Maher

Report Date 11/05/03
Receipt Date 09/23/03

Lockwood Greene

Lab. Sample No. L6268-02 Client ID SOIL#2 Product GAMMA SPECTROMETRY
Reference Date 09/17/03 Analysis Date 10/22/03 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/kg)			TPU 1 Sigma (pCi/kg)	Measured MDC (pCi/kg)	Required MDC (pCi/kg)	Flags
AcTh-228	2.01E+02	+/-	2.1E+01	2.3E+01	7.1E+01		bc
Ag-108m	4.3E+00	+/-	4.1E+00	4.1E+00	1.4E+01		
Ag-110m	8.8E+00	+/-	8.0E+00	8.0E+00	2.7E+01		
Am-241	2E+01	+/-	2.4E+01	2.4E+01	7.9E+01		
Ba-140	1E+01	+/-	1.1E+02	1.1E+02	3.8E+02		
Be-7	-7.6E+01	+/-	5.4E+01	5.4E+01	2.0E+02		
Ce-141	-2E+00	+/-	1.5E+01	1.5E+01	5.2E+01		
Ce-144	1.5E+01	+/-	3.4E+01	3.4E+01	1.2E+02		
Co-57	2.5E+00	+/-	4.2E+00	4.2E+00	1.4E+01		
Co-58	-7.3E+00	+/-	6.0E+00	6.0E+00	2.3E+01		
Co-60	6E-01	+/-	5.3E+00	5.3E+00	1.9E+01	1.5E+02	
Cr-51	-8.5E+01	+/-	9.2E+01	9.2E+01	3.2E+02		
Cs-134	-1E+01	+/-	2.6E+01	2.6E+01	8.8E+01	1.5E+02	
Cs-137	1.33E+01	+/-	6.8E+00	6.8E+00	2.2E+01	1.5E+02	c
Fe-59	1.1E+01	+/-	1.4E+01	1.4E+01	5.0E+01		
I-131	1.8E+01	+/-	8.8E+01	8.8E+01	3.0E+02		
K-40	3.5E+03	+/-	1.6E+02	2.4E+02	2.1E+02		bc
La-140	3.5E+01	+/-	5.3E+01	5.3E+01	1.8E+02		
Mn-54	1.5E+00	+/-	6.1E+00	6.1E+00	2.1E+01		
Nb-95	-2.4E+01	+/-	1.5E+01	1.6E+01	5.5E+01		
Ru-103	1.15E+01	+/-	6.6E+00	6.7E+00	2.2E+01		
Ru-106	-5E+01	+/-	4.6E+01	4.6E+01	1.7E+02		
Sb-124	0E+00	+/-	1.1E+01	1.1E+01	4.3E+01		
Sb-125	1E+00	+/-	1.3E+01	1.3E+01	4.4E+01		
Se-75	1.31E+01	+/-	7.4E+00	7.4E+00	2.4E+01		
Zn-65	3.7E+01	+/-	3.1E+01	3.1E+01	1.0E+02		
Zr-95	0E+00	+/-	2.0E+02	2.0E+02	6.5E+02		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

MAILED
NOV 0 5 2003
FRAMATOME ANP
ENVIRONMENTAL LAB

Approved by
11/05/03
J. M. Raimondi
Sample Control Manager

FRAMATOME ANP

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Lockwood Greene
Attention Ed Maher

Report Date 11/05/03
Receipt Date 09/23/03

Lockwood Greene

Lab. Sample No. L6268-03 Client ID SOIL#3 Product GAMMA SPECTROMETRY
Reference Date 09/17/03 Analysis Date 10/22/03 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/kg)			TPU 1 Sigma (pCi/kg)	Measured MDC (pCi/kg)	Required MDC (pCi/kg)	Flags
AcTh-228	1.76E+02	+/-	2.1E+01	2.3E+01	7.5E+01		bc
Ag-108m	2.2E+00	+/-	3.6E+00	3.6E+00	1.3E+01		
Ag-110m	3.8E+00	+/-	6.1E+00	6.1E+00	2.2E+01		
Am-241	2.2E+01	+/-	1.6E+01	1.6E+01	5.1E+01		
Ba-140	9.4E+01	+/-	9.4E+01	9.4E+01	3.2E+02		
Be-7	-2.7E+01	+/-	5.0E+01	5.0E+01	1.8E+02		
Ce-141	2.6E+01	+/-	1.3E+01	1.3E+01	4.3E+01		
Ce-144	2E+01	+/-	2.7E+01	2.7E+01	9.1E+01		
Co-57	2.4E+00	+/-	3.3E+00	3.3E+00	1.1E+01		
Co-58	5.8E+00	+/-	5.5E+00	5.5E+00	1.9E+01		
Co-60	-3.6E+00	+/-	5.3E+00	5.3E+00	2.1E+01	1.5E+02	
Cr-51	4.6E+01	+/-	7.3E+01	7.3E+01	2.5E+02		
Cs-134	-1.3E+01	+/-	2.2E+01	2.2E+01	7.4E+01	1.5E+02	
Cs-137	5.01E+01	+/-	8.9E+00	9.2E+00	2.5E+01	1.5E+02	bc
Fe-59	-1.1E+01	+/-	1.5E+01	1.5E+01	5.8E+01		
I-131	-1.47E+02	+/-	7.4E+01	7.4E+01	2.8E+02		
K-40	4.22E+03	+/-	2.0E+02	2.9E+02	1.8E+02		bc
La-140	-2.1E+01	+/-	4.8E+01	4.8E+01	1.8E+02		
Mn-54	-2.2E+00	+/-	5.5E+00	5.5E+00	2.0E+01		
Nb-95	8.5E+00	+/-	6.9E+00	6.9E+00	2.3E+01		
Ru-103	1.5E+00	+/-	7.4E+00	7.4E+00	2.6E+01		
Ru-106	4.8E+01	+/-	3.3E+01	3.4E+01	1.1E+02		
Sb-124	0E+00	+/-	1.1E+01	1.1E+01	4.6E+01		
Sb-125	-2E+00	+/-	1.1E+01	1.1E+01	3.9E+01		
Se-75	-8E-01	+/-	5.9E+00	5.9E+00	2.1E+01		
Zn-65	-4.1E+01	+/-	2.6E+01	2.6E+01	9.5E+01		
Zr-95	9E+00	+/-	2.2E+01	2.2E+01	7.5E+01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

MAILED
NOV 0 5 2003
FRAMATOME ANP
ENVIRONMENTAL LAB

Approved by
11/05/03
J. M. Raimondi
Sample Control Manager

FRAMATOME ANP

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Lockwood Greene
Attention Ed Maher

Report Date 11/05/03
Receipt Date 09/23/03

Lockwood Greene

Lab. Sample No. L6268-04 Client ID SOIL#4 Product GAMMA SPECTROMETRY
Reference Date 09/17/03 Analysis Date 10/22/03 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/kg)			TPU 1 Sigma (pCi/kg)	Measured MDC (pCi/kg)	Required MDC (pCi/kg)	Flags
AcTh-228	2E+02	+/-	2.2E+01	2.4E+01	7.2E+01		bc
Ag-108m	-5.8E+00	+/-	3.4E+00	3.5E+00	1.3E+01		
Ag-110m	6.4E+00	+/-	6.0E+00	6.0E+00	2.0E+01		
Am-241	-7E+00	+/-	1.9E+01	1.9E+01	6.5E+01		
Ba-140	8.4E+01	+/-	9.1E+01	9.1E+01	3.1E+02		
Be-7	-6.4E+01	+/-	5.0E+01	5.0E+01	1.9E+02		
Ce-141	-1.1E+01	+/-	1.3E+01	1.3E+01	4.4E+01		
Ce-144	8.6E+01	+/-	3.1E+01	3.2E+01	1.0E+02		
Co-57	1.1E+00	+/-	3.7E+00	3.7E+00	1.2E+01		
Co-58	1.4E+00	+/-	5.6E+00	5.6E+00	2.0E+01		
Co-60	2.7E+00	+/-	5.4E+00	5.4E+00	1.9E+01	1.5E+02	
Cr-51	-7.4E+01	+/-	8.2E+01	8.2E+01	2.9E+02		
Cs-134	1.8E+01	+/-	2.0E+01	2.0E+01	6.7E+01	1.5E+02	
Cs-137	4.87E+01	+/-	7.9E+00	8.2E+00	2.1E+01	1.5E+02	bc
Fe-59	-2E+01	+/-	1.6E+01	1.6E+01	6.2E+01		
I-131	-2.8E+01	+/-	7.5E+01	7.5E+01	2.7E+02		
K-40	3.97E+03	+/-	1.9E+02	2.8E+02	1.9E+02		bc
La-140	-6.3E+01	+/-	4.8E+01	4.8E+01	1.8E+02		
Mn-54	3.6E+00	+/-	4.1E+00	4.1E+00	1.4E+01		
Nb-95	3.1E+00	+/-	7.8E+00	7.8E+00	2.8E+01		
Ru-103	8E-01	+/-	6.8E+00	6.8E+00	2.4E+01		
Ru-106	-3.3E+01	+/-	4.1E+01	4.1E+01	1.5E+02		
Sb-124	9.6E+00	+/-	8.5E+00	8.5E+00	3.0E+01		
Sb-125	1E+00	+/-	1.1E+01	1.1E+01	4.0E+01		
Se-75	7.1E+00	+/-	5.8E+00	5.8E+00	1.9E+01		
Zn-65	5E+00	+/-	2.7E+01	2.7E+01	9.3E+01		
Zr-95	6E+00	+/-	2.3E+01	2.3E+01	7.9E+01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

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FRAMATOME ANP
ENVIRONMENTAL LAB

Approved by
11/05/03
J. M. Raimondi
Sample Control Manager

FRAMATOME ANP

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Lockwood Greene
Attention Ed Maher

Report Date 11/05/03
Receipt Date 09/23/03

Lockwood Greene

Lab. Sample No. L6268-05 Client ID SOIL#5 Product GAMMA SPECTROMETRY
Reference Date 09/17/03 Analysis Date 10/22/03 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/kg)			TPU 1 Sigma (pCi/kg)	Measured MDC (pCi/kg)	Required MDC (pCi/kg)	Flags
AcTh-228	2.3E+02	+/-	1.5E+01	1.9E+01	5.3E+01		bc
Ag-108m	-6.8E+00	+/-	3.6E+00	3.6E+00	1.3E+01		
Ag-110m	-1.6E+00	+/-	4.7E+00	4.7E+00	1.7E+01		
Am-241	-2.4E+01	+/-	2.6E+01	2.7E+01	9.2E+01		
Ba-140	1.82E+02	+/-	8.6E+01	8.6E+01	2.8E+02		
Be-7	-1E+01	+/-	5.1E+01	5.1E+01	1.8E+02		
Ce-141	2.3E+01	+/-	1.3E+01	1.4E+01	4.4E+01		
Ce-144	-1.1E+01	+/-	2.8E+01	2.8E+01	9.6E+01		
Co-57	6E-01	+/-	3.5E+00	3.5E+00	1.2E+01		
Co-58	5E-01	+/-	4.7E+00	4.7E+00	1.7E+01		
Co-60	-2.1E+00	+/-	3.2E+00	3.2E+00	1.2E+01	1.5E+02	
Cr-51	5.5E+01	+/-	6.7E+01	6.7E+01	2.3E+02		
Cs-134	-1.5E+01	+/-	1.5E+01	1.5E+01	4.9E+01	1.5E+02	
Cs-137	2.29E+02	+/-	1.0E+01	1.5E+01	1.6E+01	1.5E+02	bc
Fe-59	2.2E+01	+/-	1.2E+01	1.2E+01	4.0E+01		
I-131	1.16E+02	+/-	6.8E+01	6.9E+01	2.2E+02		
K-40	5.09E+03	+/-	1.6E+02	3.0E+02	1.0E+02		bc
La-140	3.3E+01	+/-	4.7E+01	4.7E+01	1.6E+02		
Mn-54	-4E-01	+/-	3.9E+00	3.9E+00	1.4E+01		
Nb-95	1.3E+01	+/-	7.5E+00	7.5E+00	2.5E+01		
Ru-103	-3E-01	+/-	6.9E+00	6.9E+00	2.4E+01		
Ru-106	-7.5E+01	+/-	3.5E+01	3.6E+01	1.3E+02		
Sb-124	-5.2E+00	+/-	6.8E+00	6.8E+00	2.9E+01		
Sb-125	-1.42E+01	+/-	9.9E+00	1.0E+01	3.6E+01		
Se-75	-5.3E+00	+/-	5.8E+00	5.6E+00	2.0E+01		
Zn-65	-6E+00	+/-	1.8E+01	1.8E+01	6.3E+01		
Zr-95	-2.4E+01	+/-	1.7E+01	1.7E+01	6.2E+01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

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ENVIRONMENTAL LAB

Approved by
11/05/03
J. M. Raimondi
Sample Control Manager

FRAMATOME ANP

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Lockwood Greene

Customer Lockwood Greene
Attention Ed Maher

Report Date 11/05/03
Receipt Date 09/23/03

Lab. Sample No. L6268-06 Client ID SOIL#6 Product GAMMA SPECTROMETRY
Reference Date 09/17/03 Analysis Date 10/22/03 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/kg)			TPU 1 Sigma (pCi/kg)	Measured MDC (pCi/kg)	Required MDC (pCi/kg)	Flags
AcTh-228	1.73E+02	+/-	1.5E+01	1.7E+01	4.5E+01		bc
Ag-108m	5.1E+00	+/-	2.7E+00	2.7E+00	8.9E+00		
Ag-110m	-9.6E+00	+/-	4.6E+00	4.7E+00	1.8E+01		
Am-241	-9E+00	+/-	2.1E+01	2.1E+01	7.2E+01		
Ba-140	6.7E+01	+/-	7.0E+01	7.0E+01	2.4E+02		
Be-7	2E+01	+/-	3.8E+01	3.8E+01	1.3E+02		
Ce-141	3E+00	+/-	1.1E+01	1.1E+01	3.6E+01		
Ce-144	-1E+00	+/-	2.3E+01	2.3E+01	7.9E+01		
Co-57	1.5E+00	+/-	3.0E+00	3.0E+00	1.0E+01		
Co-58	-6.1E+00	+/-	4.2E+00	4.2E+00	1.6E+01		
Co-60	-5.7E+00	+/-	3.4E+00	3.4E+00	1.4E+01	1.5E+02	
Cr-51	-7.1E+01	+/-	5.9E+01	5.9E+01	2.1E+02		
Cs-134	7E+00	+/-	2.9E+00	2.9E+00	9.0E+00	1.5E+02	
Cs-137	6.36E+01	+/-	5.9E+00	6.7E+00	1.3E+01	1.5E+02	bc
Fe-59	5E+00	+/-	1.1E+01	1.1E+01	3.8E+01		
I-131	-6.6E+01	+/-	6.3E+01	6.3E+01	2.3E+02		
K-40	3.33E+03	+/-	1.3E+02	2.1E+02	1.1E+02		bc
La-140	0E+00	+/-	3.5E+01	3.5E+01	1.2E+02		
Mn-54	-2.2E+00	+/-	3.3E+00	3.3E+00	1.2E+01		
Nb-95	7E-01	+/-	7.0E+00	7.0E+00	2.5E+01		
Ru-103	1.4E+00	+/-	5.8E+00	5.8E+00	2.0E+01		
Ru-106	4.3E+01	+/-	3.0E+01	3.0E+01	9.9E+01		
Sb-124	0E+00	+/-	7.7E+00	7.7E+00	3.0E+01		
Sb-125	4.7E+00	+/-	8.1E+00	8.1E+00	2.8E+01		
Se-75	-1.2E+00	+/-	5.2E+00	5.2E+00	1.8E+01		
Zn-65	-5E+00	+/-	1.7E+01	1.7E+01	6.0E+01		
Zr-95	-4.6E+01	+/-	1.3E+01	1.3E+01	5.7E+01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

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ENVIRONMENTAL LAB

Approved by
11/05/03
J. M. Raimondi
Sample Control Manager

FRAMATOME ANP

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Lockwood Greene

Customer Lockwood Greene
Attention Ed Maher

Report Date 11/05/03
Receipt Date 09/23/03

Lab. Sample No. L6268-07 Client ID SOIL#7 Product GAMMA SPECTROMETRY
Reference Date 09/17/03 Analysis Date 10/22/03 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/kg)			TPU 1 Sigma (pCi/kg)	Measured MDC (pCi/kg)	Required MDC (pCi/kg)	Flags
AcTh-228	1.84E+02	+/-	1.4E+01	1.7E+01	4.7E+01		bc
Ag-108m	-1.9E+00	+/-	3.0E+00	3.0E+00	1.1E+01		
Ag-110m	0E+00	+/-	4.2E+00	4.2E+00	1.5E+01		
Am-241	1E+01	+/-	1.9E+01	1.9E+01	6.5E+01		
Ba-140	-1.3E+01	+/-	1.5E+01	1.5E+01	6.2E+01		
Be-7	-7.4E+01	+/-	4.2E+01	4.2E+01	1.6E+02		
Ce-141	2.1E+01	+/-	1.1E+01	1.1E+01	3.6E+01		
Ce-144	-8E+00	+/-	2.6E+01	2.6E+01	8.8E+01		
Co-57	-4.2E+00	+/-	3.3E+00	3.3E+00	1.1E+01		
Co-58	8E-01	+/-	3.5E+00	3.5E+00	1.3E+01		
Co-60	-5.5E+00	+/-	3.0E+00	3.0E+00	1.2E+01	1.5E+02	
Cr-51	5.1E+01	+/-	6.5E+01	6.5E+01	2.2E+02		
Cs-134	2.8E+00	+/-	4.2E+00	4.2E+00	1.4E+01	1.5E+02	
Cs-137	8.77E+01	+/-	6.4E+00	7.8E+00	1.4E+01	1.5E+02	bc
Fe-59	-1.8E+01	+/-	1.2E+01	1.2E+01	4.9E+01		
I-131	1.22E+02	+/-	6.5E+01	6.5E+01	2.1E+02		
K-40	4.06E+03	+/-	1.3E+02	2.4E+02	8.9E+01		bc
La-140	-1.5E+01	+/-	1.8E+01	1.8E+01	7.2E+01		
Mn-54	-1E+00	+/-	3.3E+00	3.3E+00	1.2E+01		
Nb-95	-6E-01	+/-	6.5E+00	6.5E+00	2.3E+01		
Ru-103	-4.6E+00	+/-	4.7E+00	4.7E+00	1.7E+01		
Ru-106	-3.7E+01	+/-	3.0E+01	3.1E+01	1.1E+02		
Sb-124	-6.2E+00	+/-	7.0E+00	7.0E+00	2.9E+01		
Sb-125	-3.5E+00	+/-	9.0E+00	9.0E+00	3.2E+01		
Se-75	3.7E+00	+/-	4.9E+00	4.9E+00	1.7E+01		
Zn-65	-1E+00	+/-	1.6E+01	1.6E+01	5.3E+01		
Zr-95	8E+00	+/-	6.8E+00	6.8E+00	2.3E+01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Approved by
11/05/03
J. M. Raimondi
Sample Control Manager

Reporting Level Ratio:

c:

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Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Lockwood Greene
Attention Ed Maher

Report Date 11/05/03
Receipt Date 09/23/03

Lockwood Greene

Lab. Sample No. L6268-08 Client ID SOIL#8 Product GAMMA SPECTROMETRY
Reference Date 09/17/03 Analysis Date 10/22/03 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/kg)			TPU 1 Sigma (pCi/kg)	Measured MDC (pCi/kg)	Required MDC (pCi/kg)	Flags
AcTh-228	1.41E+02	+/-	1.6E+01	1.7E+01	6.0E+01		bc
Ag-108m	3.2E+00	+/-	2.6E+00	2.6E+00	8.8E+00		
Ag-110m	-2.8E+00	+/-	4.7E+00	4.7E+00	1.8E+01		
Am-241	1.5E+01	+/-	1.2E+01	1.2E+01	4.1E+01		
Ba-140	5.1E+01	+/-	7.3E+01	7.3E+01	2.5E+02		
Be-7	0E+00	+/-	4.4E+01	4.4E+01	1.5E+02		
Ce-141	-9.9E+00	+/-	9.9E+00	9.9E+00	3.5E+01		
Ce-144	-1E+00	+/-	1.9E+01	1.9E+01	6.7E+01		
Co-57	6E-01	+/-	2.5E+00	2.5E+00	8.4E+00		
Co-58	-1.5E+00	+/-	5.0E+00	5.0E+00	1.6E+01		
Co-60	-7.4E+00	+/-	4.3E+00	4.3E+00	1.7E+01	1.5E+02	
Cr-51	-8.5E+01	+/-	5.4E+01	5.4E+01	2.0E+02		
Cs-134	-1.6E+00	+/-	2.9E+00	2.9E+00	1.1E+01	1.5E+02	
Cs-137	7.52E+01	+/-	6.8E+00	7.7E+00	1.5E+01	1.5E+02	bc
Fe-59	3E+00	+/-	1.2E+01	1.2E+01	4.4E+01		
I-131	-8.1E+01	+/-	5.1E+01	5.1E+01	1.9E+02		
K-40	4E+03	+/-	1.6E+02	2.6E+02	1.4E+02		bc
La-140	-3.6E+01	+/-	3.8E+01	3.8E+01	1.4E+02		
Mn-54	-6.8E+00	+/-	4.3E+00	4.3E+00	1.6E+01		
Nb-95	-2.11E+01	+/-	8.0E+00	8.1E+00	3.1E+01		
Ru-103	5E-01	+/-	5.2E+00	5.2E+00	1.8E+01		
Ru-106	4.7E+01	+/-	2.8E+01	2.8E+01	9.1E+01		
Sb-124	0E+00	+/-	9.0E+00	9.0E+00	3.6E+01		
Sb-125	1.47E+01	+/-	9.5E+00	9.5E+00	3.1E+01		
Se-75	-3.1E+00	+/-	4.6E+00	4.6E+00	1.6E+01		
Zn-65	-1.5E+01	+/-	2.1E+01	2.1E+01	7.3E+01		
Zr-95	1.4E+01	+/-	1.7E+01	1.7E+01	5.6E+01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

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ENVIRONMENTAL LAB

Approved by
11/05/03
J. M. Raimondi
Sample Control Manager

FRAMATOME ANP

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Lockwood Greene

Customer Lockwood Greene
Attention Ed Maher

Report Date 11/05/03
Receipt Date 09/23/03

Lab. Sample No. L6268-09 Client ID SOIL#9 Product GAMMA SPECTROMETRY
Reference Date 09/17/03 Analysis Date 10/22/03 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/kg)			TPU 1 Sigma (pCi/kg)	Measured MDC (pCi/kg)	Required MDC (pCi/kg)	Flags
AcTh-228	1.72E+02	+/-	1.6E+01	1.6E+01	5.3E+01		bc
Ag-108m	1.1E+00	+/-	3.0E+00	3.0E+00	1.0E+01		
Ag-110m	-3.3E+00	+/-	5.1E+00	5.1E+00	1.9E+01		
Am-241	1.2E+01	+/-	1.6E+01	1.6E+01	5.3E+01		
Ba-140	0E+00	+/-	7.3E+01	7.3E+01	2.6E+02		
Be-7	2.7E+01	+/-	4.4E+01	4.4E+01	1.5E+02		
Ce-141	-1.65E+01	+/-	9.8E+00	9.8E+00	3.5E+01		
Ce-144	-3.5E+01	+/-	2.4E+01	2.4E+01	8.3E+01		
Co-57	-2.6E+00	+/-	3.0E+00	3.0E+00	1.1E+01		
Co-58	-5.6E+00	+/-	4.3E+00	4.3E+00	1.7E+01		
Co-60	4E-01	+/-	3.2E+00	3.2E+00	1.2E+01	1.5E+02	
Cr-51	-1.88E+02	+/-	6.5E+01	6.5E+01	2.4E+02		
Cs-134	-1E+01	+/-	1.5E+01	1.5E+01	5.0E+01	1.5E+02	
Cs-137	8.65E+01	+/-	8.1E+00	9.2E+00	1.9E+01	1.5E+02	bc
Fe-59	1E+01	+/-	1.3E+01	1.3E+01	4.4E+01		
I-131	-2.1E+01	+/-	6.2E+01	6.2E+01	2.2E+02		
K-40	3.77E+03	+/-	1.6E+02	2.5E+02	1.2E+02		bc
La-140	1.04E+02	+/-	4.4E+01	4.4E+01	1.4E+02		
Mn-54	-3E+00	+/-	3.9E+00	3.9E+00	1.5E+01		
Nb-95	4E+00	+/-	1.1E+01	1.1E+01	3.8E+01		
Ru-103	-5.5E+00	+/-	5.4E+00	5.4E+00	2.0E+01		
Ru-106	-2.1E+01	+/-	3.3E+01	3.3E+01	1.2E+02		
Sb-124	0E+00	+/-	7.3E+00	7.3E+00	3.0E+01		
Sb-125	1.63E+01	+/-	9.4E+00	9.4E+00	3.1E+01		
Se-75	-1.17E+01	+/-	4.7E+00	4.7E+00	1.8E+01		
Zn-65	2E+01	+/-	2.0E+01	2.0E+01	6.8E+01		
Zr-95	-1.1E+01	+/-	1.6E+01	1.6E+01	5.9E+01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

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ENVIRONMENTAL LAB

Approved by
11/05/03
J. M. Raimondi
Sample Control Manager

AREVA

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer
Lockwood Greene
1500 International Drive
Spartanburg, SC 29304
Attn: Carl Jackson

Product U-234, U-235, U-238

Report Date 04/27/04
Receipt Date 04/05/04

LSN	Client ID & Description	Reference Date	Analysis Date	Nuclide	Activity Concentration +/- 1-Sigma (pCi/kg)	TPU 1 Sigma (pCi/kg)	Measured MDC (pCi/kg)	Required MDC (pCi/kg)	Flags	Reporting Level Ratio
Soil										
L7165-01	SS - 2	04/01/2004	04/21/2004	U-234	1.592E+02 +/- 7.8E+00	9.4E+00	2.8E+00	1.0E+03	b	
L7165-01	SS - 2	04/01/2004	04/21/2004	U-235	6.6E+00 +/- 2.0E+00	2.0E+00	5.0E+00	1.0E+03	b	
L7165-01	SS - 2	04/01/2004	04/21/2004	U-238	1.468E+02 +/- 7.5E+00	9.0E+00	4.5E+00	1.0E+03	b	
L7165-02	SS - 6	04/01/2004	04/20/2004	U-234	1.65E+02 +/- 1.0E+01	1.2E+01	3.1E+00	1.0E+03	b	
L7165-02	SS - 6	04/01/2004	04/20/2004	U-235	6.7E+00 +/- 2.5E+00	2.5E+00	5.5E+00	1.0E+03		
L7165-02	SS - 6	04/01/2004	04/20/2004	U-238	1.58E+02 +/- 1.0E+01	1.2E+01	4.5E+00	1.0E+03	b	
L7165-03	SS - 9	04/01/2004	04/21/2004	U-234	1.684E+02 +/- 7.9E+00	9.7E+00	7.5E+00	1.0E+03	b	
L7165-03	SS - 9	04/01/2004	04/21/2004	U-235	1.06E+01 +/- 2.2E+00	2.2E+00	3.1E+00	1.0E+03	b	
L7165-03	SS - 9	04/01/2004	04/21/2004	U-238	1.612E+02 +/- 7.5E+00	9.2E+00	2.5E+00	1.0E+03	b	
L7165-04	SS - 11	04/01/2004	04/20/2004	U-234	1.654E+02 +/- 8.4E+00	1.0E+01	8.2E+00	1.0E+03	b	
L7165-04	SS - 11	04/01/2004	04/20/2004	U-235	1.16E+01 +/- 2.8E+00	2.9E+00	6.3E+00	1.0E+03	b	
L7165-04	SS - 11	04/01/2004	04/20/2004	U-238	1.685E+02 +/- 8.2E+00	1.0E+01	3.7E+00	1.0E+03	b	

Flags:
a The measured MDC is greater than the required MDC.
b The activity concentration is greater than three times its one sigma counting uncertainty.

Approved by
4/27/04
J. M. Raimondi
Laboratory Manager

c:

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APR 27 2004
FRAMATOME ANP
ENVIRONMENTAL LAB

AREVA

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer
Lockwood Greene
1500 International Drive
Spartanburg, SC 29304
Attn: Carl Jackson

Product U-234, U-235, U-238

Report Date 04/27/04
Receipt Date 04/05/04

LSN	Client ID & Description	Reference Date	Analysis Date	Nuclide	Activity Concentration +/- 1-Sigma (pCi/kg)	TPU 1 Sigma (pCi/kg)	Measured MDC (pCi/kg)	Required MDC (pCi/kg)	Reporting Level Ratio	Flags
Soil										
L7165-05	SS - 12	04/01/2004	04/20/2004	U-234	1.594E+02 +/- 7.7E+00	9.4E+00	7.4E+00	1.0E+03		b
L7165-05	SS - 12	04/01/2004	04/20/2004	U-235	1.11E+01 +/- 2.6E+00	2.6E+00	5.6E+00	1.0E+03		b
L7165-05	SS - 12	04/01/2004	04/20/2004	U-238	1.625E+02 +/- 7.6E+00	9.4E+00	5.5E+00	1.0E+03		b
L7165-06	SS - 13	04/01/2004	04/20/2004	U-234	1.43E+02 +/- 6.0E+00	7.7E+00	2.7E+00	1.0E+03		b
L7165-06	SS - 13	04/01/2004	04/20/2004	U-235	9.7E+00 +/- 2.0E+00	2.0E+00	4.0E+00	1.0E+03		b
L7165-06	SS - 13	04/01/2004	04/20/2004	U-238	1.576E+02 +/- 6.3E+00	8.2E+00	1.8E+00	1.0E+03		b
L7165-07	SS - 15	04/01/2004	04/20/2004	U-234	1.615E+02 +/- 7.5E+00	9.3E+00	5.1E+00	1.0E+03		b
L7165-07	SS - 15	04/01/2004	04/20/2004	U-235	7.5E+00 +/- 1.8E+00	1.9E+00	3.5E+00	1.0E+03		b
L7165-07	SS - 15	04/01/2004	04/20/2004	U-238	1.564E+02 +/- 7.3E+00	9.0E+00	3.2E+00	1.0E+03		b
L7165-08	SS - 16	04/01/2004	04/20/2004	U-234	1.654E+02 +/- 6.4E+00	8.5E+00	2.7E+00	1.0E+03		b
L7165-08	SS - 16	04/01/2004	04/20/2004	U-235	6.4E+00 +/- 1.6E+00	1.6E+00	3.6E+00	1.0E+03		b
L7165-08	SS - 16	04/01/2004	04/20/2004	U-238	1.528E+02 +/- 6.1E+00	8.0E+00	1.8E+00	1.0E+03		b

Flags:
a The measured MDC is greater than the required MDC.
b The activity concentration is greater than three times its one sigma counting uncertainty.

Approved by
4/27/04
J. M. Raimondi
Laboratory Manager

c:

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FRAMATOME ANP
ENVIRONMENTAL LAB

FRAMATOME ANP

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Lockwood Greene
Attention Ed Maher

Report Date 11/05/03
Receipt Date 09/23/03

Lockwood Greene

Lab. Sample No. L6268-10 Client ID SOIL#10 Product GAMMA SPECTROMETRY
Reference Date 09/17/03 Analysis Date 10/22/03 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/kg)			TPU 1 Sigma (pCi/kg)	Measured MDC (pCi/kg)	Required MDC (pCi/kg)	Flags
AcTh-228	2.12E+02	+/-	1.3E+01	1.7E+01	4.2E+01		bc
Ag-108m	-1.2E+00	+/-	2.7E+00	2.7E+00	9.6E+00		
Ag-110m	1.5E+00	+/-	4.2E+00	4.2E+00	1.5E+01		
Am-241	-9E+00	+/-	2.1E+01	2.1E+01	7.1E+01		
Ba-140	-4.7E+01	+/-	6.4E+01	6.5E+01	2.3E+02		
Be-7	7.3E+01	+/-	3.6E+01	3.6E+01	1.2E+02		
Ce-141	1E+01	+/-	1.1E+01	1.1E+01	3.6E+01		
Ce-144	-2.2E+01	+/-	2.1E+01	2.1E+01	7.4E+01		
Co-57	-9E-01	+/-	2.8E+00	2.8E+00	9.6E+00		
Co-58	-4.3E+00	+/-	4.0E+00	4.0E+00	1.5E+01		
Co-60	3.6E+00	+/-	2.9E+00	2.9E+00	9.6E+00	1.5E+02	
Cr-51	-3.6E+01	+/-	5.6E+01	5.6E+01	1.9E+02		
Cs-134	-1.4E+01	+/-	1.2E+01	1.2E+01	3.9E+01	1.5E+02	
Cs-137	7.66E+01	+/-	5.8E+00	6.9E+00	1.3E+01	1.5E+02	bc
Fe-59	-1.1E+01	+/-	1.0E+01	1.0E+01	3.8E+01		
I-131	1.7E+01	+/-	5.5E+01	5.5E+01	1.9E+02		
K-40	4.34E+03	+/-	1.2E+02	2.5E+02	9.7E+01		bc
La-140	5.4E+01	+/-	3.4E+01	3.4E+01	1.1E+02		
Mn-54	4.9E+00	+/-	3.2E+00	3.2E+00	1.1E+01		
Nb-95	-1.1E+00	+/-	9.1E+00	9.1E+00	3.1E+01		
Ru-103	1.2E+00	+/-	5.4E+00	5.4E+00	1.8E+01		
Ru-106	1.8E+01	+/-	2.9E+01	2.9E+01	9.8E+01		
Sb-124	-2.4E+00	+/-	4.6E+00	4.6E+00	1.9E+01		
Sb-125	3.1E+00	+/-	8.2E+00	8.2E+00	2.8E+01		
Se-75	2E-01	+/-	4.5E+00	4.5E+00	1.6E+01		
Zn-65	1.1E+01	+/-	1.5E+01	1.5E+01	5.0E+01		
Zr-95	-1.5E+01	+/-	1.3E+01	1.3E+01	4.8E+01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

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FRAMATOME ANP
ENVIRONMENTAL LAB

Approved by
11/05/03
J. M. Raimondi
Sample Control Manager

AREVA

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Lockwood Greene
Attention Carl Jackson

Report Date 04/27/04
Receipt Date 04/05/04

Lockwood Greene
1500 International Drive

Spartanburg, SC 29304

Lab. Sample No. L7165-01 Client ID SS - 2 Product GAMMA SPECTROMETRY
Reference Date 04/01/04 Analysis Date 04/22/04 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/kg)			TPU 1 Sigma (pCi/kg)	Measured MDC (pCi/kg)	Required MDC (pCi/kg)	Flags
AcTh-228	1.81E+02	+/-	2.0E+01	2.2E+01	6.9E+01		bc
Ag-108m	-4.7E+00	+/-	4.0E+00	4.0E+00	1.5E+01		
Ag-110m	9E+00	+/-	5.5E+00	5.6E+00	1.8E+01		
Am-241	-2.3E+01	+/-	2.1E+01	2.1E+01	7.4E+01		
Ba-140	-7.7E+01	+/-	4.4E+01	4.5E+01	1.7E+02		
Be-7	-1.4E+01	+/-	4.5E+01	4.5E+01	1.6E+02		
Ce-141	2.31E+01	+/-	9.5E+00	9.5E+00	3.0E+01		
Ce-144	-5.7E+01	+/-	2.8E+01	2.8E+01	1.0E+02		
Co-57	-1.1E+00	+/-	3.6E+00	3.6E+00	1.3E+01		
Co-58	-5E-01	+/-	4.6E+00	4.6E+00	1.7E+01		
Co-60	-5E-01	+/-	4.7E+00	4.7E+00	1.8E+01	1.5E+02	
Cr-51	-5E+00	+/-	5.2E+01	5.2E+01	1.8E+02		
Cs-134	5E+00	+/-	1.8E+01	1.8E+01	6.1E+01	1.5E+02	
Cs-137	1.155E+02	+/-	9.7E+00	1.1E+01	1.9E+01	1.5E+02	bc
Fe-59	-1.1E+01	+/-	1.3E+01	1.3E+01	4.9E+01		
I-131	1.2E+01	+/-	2.3E+01	2.3E+01	8.0E+01		
K-40	3.72E+03	+/-	1.8E+02	2.6E+02	1.5E+02		bc
La-140	-5E+00	+/-	2.2E+01	2.2E+01	8.0E+01		
Mn-54	1.8E+00	+/-	4.6E+00	4.6E+00	1.7E+01		
Nb-95	-4.1E+00	+/-	6.6E+00	6.6E+00	2.5E+01		
Ru-103	7E+00	+/-	5.6E+00	5.6E+00	1.9E+01		
Ru-106	-2.6E+01	+/-	3.8E+01	3.8E+01	1.4E+02		
Sb-124	-5.4E+00	+/-	6.6E+00	6.6E+00	3.2E+01		
Sb-125	8E+00	+/-	1.2E+01	1.2E+01	4.1E+01		
Se-75	1.2E+00	+/-	6.0E+00	6.0E+00	2.1E+01		
Zn-65	1.4E+01	+/-	1.0E+01	1.0E+01	3.5E+01		
Zr-95	-8.5E+00	+/-	8.5E+00	8.5E+00	3.3E+01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

Approved by
4/27/04
J. M.Raimondi
Laboratory Manager

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APR 2 7 2004
FRAMATOME ANP
ENVIRONMENTAL LAB

AREVA

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Lockwood Greene
Attention Carl Jackson

Report Date 04/27/04
Receipt Date 04/05/04

Lockwood Greene
1500 International Drive

Spartanburg, SC 29304

Lab. Sample No. L7165-02 Client ID SS - 6 Product GAMMA SPECTROMETRY
Reference Date 04/01/04 Analysis Date 04/22/04 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/kg)			TPU 1 Sigma (pCi/kg)	Measured MDC (pCi/kg)	Required MDC (pCi/kg)	Flags
AcTh-228	1.51E+02	+/-	2.2E+01	2.3E+01	7.6E+01		bc
Ag-108m	3.4E+00	+/-	4.1E+00	4.1E+00	1.4E+01		
Ag-110m	-2.5E+00	+/-	5.7E+00	5.7E+00	2.3E+01		
Am-241	6E+00	+/-	1.8E+01	1.8E+01	6.1E+01		
Ba-140	7.3E+01	+/-	4.0E+01	4.1E+01	1.3E+02		
Be-7	-1.09E+02	+/-	4.8E+01	4.8E+01	1.9E+02		
Ce-141	8E+00	+/-	1.0E+01	1.0E+01	3.5E+01		
Ce-144	-6E+00	+/-	2.7E+01	2.7E+01	9.3E+01		
Co-57	4E+00	+/-	3.2E+00	3.3E+00	1.1E+01		
Co-58	8.4E+00	+/-	5.9E+00	5.9E+00	2.0E+01		
Co-60	9E-01	+/-	5.9E+00	5.9E+00	2.2E+01	1.5E+02	
Cr-51	2E+01	+/-	4.9E+01	4.9E+01	1.7E+02		
Cs-134	-4.3E+00	+/-	3.8E+00	3.8E+00	1.5E+01	1.5E+02	
Cs-137	8.07E+01	+/-	9.2E+00	1.0E+01	1.9E+01	1.5E+02	bc
Fe-59	-1.7E+01	+/-	1.4E+01	1.4E+01	5.8E+01		
I-131	-6E+00	+/-	2.4E+01	2.4E+01	8.9E+01		
K-40	3.78E+03	+/-	2.2E+02	2.9E+02	2.4E+02		bc
La-140	7E+00	+/-	2.5E+01	2.5E+01	8.9E+01		
Mn-54	1.2E+00	+/-	5.1E+00	5.1E+00	1.9E+01		
Nb-95	-1.12E+01	+/-	8.0E+00	8.0E+00	3.2E+01		
Ru-103	-2.7E+00	+/-	6.2E+00	6.2E+00	2.3E+01		
Ru-106	-6E+00	+/-	3.8E+01	3.8E+01	1.4E+02		
Sb-124	-7.5E+00	+/-	9.2E+00	9.2E+00	4.5E+01		
Sb-125	-9E+00	+/-	1.3E+01	1.3E+01	4.8E+01		
Se-75	-3.7E+00	+/-	5.7E+00	5.7E+00	2.1E+01		
Zn-65	3.1E+01	+/-	2.3E+01	2.3E+01	7.7E+01		
Zr-95	1.35E+01	+/-	9.4E+00	9.4E+00	3.1E+01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

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APR 27 2004
FRAMATOME ANP
ENVIRONMENTAL LAB

Approved by
4/27/04
J. M.Raimondi
Laboratory Manager

AREVA

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Lockwood Greene
Attention Carl Jackson

Report Date 04/27/04
Receipt Date 04/05/04

Lockwood Greene
1500 International Drive

Spartanburg, SC 29304

Lab. Sample No. L7165-03 Client ID SS - 9 Product GAMMA SPECTROMETRY
Reference Date 04/01/04 Analysis Date 04/22/04 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/kg)			TPU 1 Sigma (pCi/kg)	Measured MDC (pCi/kg)	Required MDC (pCi/kg)	Flags
AcTh-228	1.68E+02	+/-	2.3E+01	2.5E+01	7.9E+01		bc
Ag-108m	-4.4E+00	+/-	3.6E+00	3.6E+00	1.4E+01		
Ag-110m	-2.4E+00	+/-	7.5E+00	7.5E+00	2.9E+01		
Am-241	2.1E+01	+/-	2.2E+01	2.2E+01	7.2E+01		
Ba-140	1.4E+01	+/-	5.3E+01	5.3E+01	1.9E+02		
Be-7	7.9E+01	+/-	5.0E+01	5.1E+01	1.7E+02		
Ce-141	9E+00	+/-	1.1E+01	1.1E+01	3.7E+01		
Ce-144	-1E+00	+/-	3.3E+01	3.3E+01	1.1E+02		
Co-57	4.7E+00	+/-	4.0E+00	4.1E+00	1.3E+01		
Co-58	-3.7E+00	+/-	5.6E+00	5.6E+00	2.2E+01		
Co-60	-6.4E+00	+/-	5.6E+00	5.6E+00	2.4E+01	1.5E+02	
Cr-51	6E+00	+/-	6.2E+01	6.2E+01	2.2E+02		
Cs-134	-2E+01	+/-	2.2E+01	2.2E+01	7.5E+01	1.5E+02	
Cs-137	8.4E+01	+/-	1.1E+01	1.1E+01	2.5E+01	1.5E+02	bc
Fe-59	1.2E+01	+/-	1.4E+01	1.4E+01	5.0E+01		
I-131	3.3E+01	+/-	2.8E+01	2.8E+01	9.3E+01		
K-40	3.65E+03	+/-	2.1E+02	2.8E+02	2.1E+02		bc
La-140	-3E+00	+/-	2.6E+01	2.6E+01	9.5E+01		
Mn-54	2.8E+00	+/-	4.9E+00	4.9E+00	1.7E+01		
Nb-95	-1.44E+01	+/-	6.7E+00	6.8E+00	2.9E+01		
Ru-103	0E+00	+/-	5.1E+00	5.1E+00	1.9E+01		
Ru-106	-7E+00	+/-	5.0E+01	5.0E+01	1.8E+02		
Sb-124	7.4E+00	+/-	7.4E+00	7.4E+00	2.7E+01		
Sb-125	8E+00	+/-	1.3E+01	1.3E+01	4.6E+01		
Se-75	7.2E+00	+/-	5.4E+00	5.4E+00	1.8E+01		
Zn-65	-4E+01	+/-	2.6E+01	2.6E+01	9.5E+01		
Zr-95	1.98E+01	+/-	8.7E+00	8.7E+00	2.6E+01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

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APR 2 7 2004
FRAMATOME ANP
ENVIRONMENTAL LAB

Approved by
4/27/04
J. M.Raimondi
Laboratory Manager

AREVA

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Lockwood Greene
Attention Carl Jackson

Report Date 04/27/04
Receipt Date 04/05/04

Lockwood Greene
1500 International Drive

Spartanburg, SC 29304

Lab. Sample No. L7165-04 Client ID SS - 11 Product GAMMA SPECTROMETRY
Reference Date 04/01/04 Analysis Date 04/22/04 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/kg)			TPU 1 Sigma (pCi/kg)	Measured MDC (pCi/kg)	Required MDC (pCi/kg)	Flags
AcTh-228	1.75E+02	+/-	1.7E+01	1.9E+01	4.8E+01		bc
Ag-108m	1.2E+00	+/-	2.8E+00	2.8E+00	1.0E+01		
Ag-110m	-7E-01	+/-	5.3E+00	5.3E+00	2.0E+01		
Am-241	1.5E+01	+/-	2.6E+01	2.6E+01	8.9E+01		
Ba-140	-1E+01	+/-	3.7E+01	3.7E+01	1.3E+02		
Be-7	-2.4E+01	+/-	3.8E+01	3.8E+01	1.4E+02		
Ce-141	1.2E+01	+/-	1.0E+01	1.0E+01	3.3E+01		
Ce-144	7E+00	+/-	2.7E+01	2.7E+01	9.1E+01		
Co-57	7E-01	+/-	3.4E+00	3.4E+00	1.2E+01		
Co-58	5E-01	+/-	3.8E+00	3.8E+00	1.4E+01		
Co-60	6.6E+00	+/-	3.9E+00	3.9E+00	1.3E+01	1.5E+02	
Cr-51	-1.1E+01	+/-	4.6E+01	4.6E+01	1.6E+02		
Cs-134	7.4E+00	+/-	3.4E+00	3.4E+00	1.1E+01	1.5E+02	
Cs-137	8.35E+01	+/-	7.4E+00	8.5E+00	1.5E+01	1.5E+02	bc
Fe-59	-1.7E+01	+/-	1.1E+01	1.1E+01	4.2E+01		
I-131	-1.1E+01	+/-	2.2E+01	2.2E+01	8.0E+01		
K-40	3.75E+03	+/-	1.6E+02	2.4E+02	1.5E+02		bc
La-140	1.3E+01	+/-	2.2E+01	2.2E+01	7.7E+01		
Mn-54	4.6E+00	+/-	4.0E+00	4.0E+00	1.3E+01		
Nb-95	8.1E+00	+/-	5.9E+00	5.9E+00	2.0E+01		
Ru-103	3.4E+00	+/-	5.2E+00	5.2E+00	1.8E+01		
Ru-106	3.9E+01	+/-	3.4E+01	3.4E+01	1.1E+02		
Sb-124	3.8E+00	+/-	5.9E+00	5.9E+00	2.3E+01		
Sb-125	9.3E+00	+/-	9.9E+00	9.9E+00	3.4E+01		
Se-75	-8E+00	+/-	5.4E+00	5.4E+00	2.0E+01		
Zn-65	-9E+00	+/-	1.7E+01	1.7E+01	6.1E+01		
Zr-95	2.8E+00	+/-	7.0E+00	7.0E+00	2.5E+01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

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APR 27 2004
FRAMATOME ANP
ENVIRONMENTAL LAB

Approved by
4/27/04
J. M.Raimondi
Laboratory Manager

AREVA

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Lockwood Greene
Attention Carl Jackson

Report Date 04/27/04
Receipt Date 04/05/04

Lockwood Greene
1500 International Drive

Spartanburg, SC 29304

Lab. Sample No. L7165-05 Client ID SS - 12 Product GAMMA SPECTROMETRY
Reference Date 04/01/04 Analysis Date 04/22/04 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/kg)			TPU 1 Sigma (pCi/kg)	Measured MDC (pCi/kg)	Required MDC (pCi/kg)	Flags
AcTh-228	2.05E+02	+/-	2.0E+01	2.3E+01	5.4E+01		bc
Ag-108m	6.6E+00	+/-	3.7E+00	3.7E+00	1.2E+01		
Ag-110m	-1.34E+01	+/-	6.2E+00	6.3E+00	2.6E+01		
Am-241	-2.1E+01	+/-	2.2E+01	2.2E+01	7.7E+01		
Ba-140	6E+00	+/-	4.4E+01	4.4E+01	1.6E+02		
Be-7	-2E+01	+/-	4.3E+01	4.3E+01	1.6E+02		
Ce-141	0E+00	+/-	1.0E+01	1.0E+01	3.6E+01		
Ce-144	1.3E+01	+/-	2.9E+01	2.9E+01	9.9E+01		
Co-57	-2.9E+00	+/-	3.6E+00	3.6E+00	1.3E+01		
Co-58	-3.2E+00	+/-	4.3E+00	4.3E+00	1.7E+01		
Co-60	-1.1E+00	+/-	4.4E+00	4.4E+00	1.7E+01	1.5E+02	
Cr-51	1.08E+02	+/-	5.9E+01	5.9E+01	1.9E+02		
Cs-134	3E+01	+/-	1.4E+01	1.4E+01	4.6E+01	1.5E+02	
Cs-137	5.76E+01	+/-	8.4E+00	8.9E+00	2.1E+01	1.5E+02	bc
Fe-59	4E+00	+/-	1.1E+01	1.1E+01	4.0E+01		
I-131	-5E+00	+/-	2.4E+01	2.4E+01	8.8E+01		
K-40	3.61E+03	+/-	1.9E+02	2.6E+02	1.3E+02		bc
La-140	2.3E+01	+/-	2.4E+01	2.4E+01	8.3E+01		
Mn-54	2.6E+00	+/-	4.9E+00	4.9E+00	1.7E+01		
Nb-95	-1.2E+00	+/-	6.9E+00	6.9E+00	2.5E+01		
Ru-103	-6.9E+00	+/-	5.7E+00	5.8E+00	2.2E+01		
Ru-106	1.8E+01	+/-	4.0E+01	4.0E+01	1.4E+02		
Sb-124	-5.7E+00	+/-	9.1E+00	9.1E+00	4.0E+01		
Sb-125	1.2E+01	+/-	1.1E+01	1.1E+01	3.8E+01		
Se-75	-2.9E+00	+/-	6.3E+00	6.3E+00	2.2E+01		
Zn-65	1.5E+01	+/-	2.0E+01	2.0E+01	6.8E+01		
Zr-95	1.65E+01	+/-	8.9E+00	8.9E+00	2.8E+01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

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ENVIRONMENTAL LAB

Approved by
J.M. Raimondi 4/27/04
J. M.Raimondi
Laboratory Manager

AREVA

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Lockwood Greene
Attention Carl Jackson

Report Date 04/27/04
Receipt Date 04/05/04

Lockwood Greene
1500 International Drive

Spartanburg, SC 29304

Lab. Sample No. L7165-06 Client ID SS - 13 Product GAMMA SPECTROMETRY
Reference Date 04/01/04 Analysis Date 04/22/04 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/kg)			TPU 1 Sigma (pCi/kg)	Measured MDC (pCi/kg)	Required MDC (pCi/kg)	Flags
AcTh-228	1.72E+02	+/-	2.1E+01	2.2E+01	6.4E+01		bc
Ag-108m	-6.1E+00	+/-	4.0E+00	4.1E+00	1.6E+01		
Ag-110m	2.3E+00	+/-	6.3E+00	6.3E+00	2.3E+01		
Am-241	2.3E+01	+/-	1.6E+01	1.7E+01	5.5E+01		
Ba-140	-4.2E+01	+/-	5.0E+01	5.0E+01	1.9E+02		
Be-7	-6.2E+01	+/-	4.7E+01	4.7E+01	1.8E+02		
Ce-141	-1.6E+01	+/-	1.0E+01	1.0E+01	3.8E+01		
Ce-144	5E+00	+/-	2.6E+01	2.6E+01	8.9E+01		
Co-57	-1.5E+00	+/-	3.2E+00	3.2E+00	1.1E+01		
Co-58	-4.4E+00	+/-	6.8E+00	6.8E+00	2.6E+01		
Co-60	3.9E+00	+/-	5.1E+00	5.1E+00	1.8E+01	1.5E+02	
Cr-51	3.1E+01	+/-	5.7E+01	5.7E+01	2.0E+02		
Cs-134	2.5E+00	+/-	3.1E+00	3.1E+00	1.1E+01	1.5E+02	
Cs-137	3.26E+01	+/-	8.9E+00	9.0E+00	2.6E+01	1.5E+02	bc
Fe-59	3E+00	+/-	1.3E+01	1.3E+01	4.9E+01		
I-131	5E+00	+/-	2.4E+01	2.4E+01	8.6E+01		
K-40	3.66E+03	+/-	2.2E+02	2.9E+02	2.2E+02		bc
La-140	1.1E+01	+/-	2.4E+01	2.4E+01	2.2E+02		
Mn-54	1.7E+00	+/-	4.8E+00	4.8E+00	1.8E+01		
Nb-95	-1.02E+01	+/-	6.9E+00	6.9E+00	2.8E+01		
Ru-103	-2E+00	+/-	6.6E+00	6.6E+00	2.4E+01		
Ru-106	5.3E+01	+/-	4.0E+01	4.0E+01	1.3E+02		
Sb-124	-1.16E+01	+/-	8.7E+00	8.7E+00	4.7E+01		
Sb-125	-1.1E+01	+/-	1.4E+01	1.4E+01	5.2E+01		
Se-75	0E+00	+/-	5.4E+00	5.4E+00	1.9E+01		
Zn-65	-3E+01	+/-	1.5E+01	1.5E+01	6.3E+01		
Zr-95	1.6E+01	+/-	1.1E+01	1.1E+01	3.7E+01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

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ENVIRONMENTAL LAB

Approved by
4/27/04
J. M.Raimondi
Laboratory Manager

AREVA

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Lockwood Greene
Attention Carl Jackson

Report Date 04/27/04
Receipt Date 04/05/04

Lockwood Greene
1500 International Drive

Spartanburg, SC 29304

Lab. Sample No. L7165-07 Client ID SS - 15 Product GAMMA SPECTROMETRY
Reference Date 04/01/04 Analysis Date 04/22/04 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/kg)			TPU 1 Sigma (pCi/kg)	Measured MDC (pCi/kg)	Required MDC (pCi/kg)	Flags
AcTh-228	1.56E+02	+/-	2.2E+01	2.3E+01	8.2E+01		bc
Ag-108m	-1E+00	+/-	3.7E+00	3.7E+00	1.4E+01		
Ag-110m	8.5E+00	+/-	7.9E+00	8.0E+00	2.7E+01		
Am-241	-1.7E+01	+/-	2.1E+01	2.1E+01	7.3E+01		
Ba-140	-1.4E+01	+/-	4.7E+01	4.7E+01	1.8E+02		
Be-7	-2.5E+01	+/-	5.0E+01	5.0E+01	1.9E+02		
Ce-141	-1.5E+01	+/-	1.0E+01	1.0E+01	3.7E+01		
Ce-144	-2.5E+01	+/-	3.3E+01	3.3E+01	1.2E+02		
Co-57	-5.4E+00	+/-	3.9E+00	3.9E+00	1.4E+01		
Co-58	-2.9E+00	+/-	4.6E+00	4.6E+00	1.9E+01		
Co-60	2.5E+00	+/-	5.2E+00	5.2E+00	1.9E+01	1.5E+02	
Cr-51	-9.7E+01	+/-	6.0E+01	6.0E+01	2.3E+02		
Cs-134	-3.7E+01	+/-	2.4E+01	2.4E+01	8.2E+01	1.5E+02	
Cs-137	7.4E+01	+/-	1.0E+01	1.1E+01	2.5E+01	1.5E+02	bc
Fe-59	-7E+00	+/-	1.6E+01	1.6E+01	6.1E+01		
I-131	3.1E+01	+/-	2.6E+01	2.6E+01	8.9E+01		
K-40	3.86E+03	+/-	2.2E+02	2.9E+02	2.1E+02		bc
La-140	-4E+00	+/-	2.6E+01	2.6E+01	9.6E+01		
Mn-54	-6.6E+00	+/-	4.6E+00	4.6E+00	1.9E+01		
Nb-95	-2.11E+01	+/-	6.8E+00	6.9E+00	3.1E+01		
Ru-103	1.7E+00	+/-	5.7E+00	5.7E+00	2.1E+01		
Ru-106	-5E+00	+/-	4.2E+01	4.2E+01	1.6E+02		
Sb-124	1.1E+01	+/-	1.1E+01	1.1E+01	4.1E+01		
Sb-125	5E+00	+/-	1.2E+01	1.2E+01	4.3E+01		
Se-75	-7.2E+00	+/-	5.7E+00	5.7E+00	2.1E+01		
Zn-65	-1.5E+01	+/-	2.7E+01	2.7E+01	9.6E+01		
Zr-95	2.1E+00	+/-	9.2E+00	9.2E+00	3.4E+01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

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FRAMATOME ANP
ENVIRONMENTAL LAB

Approved by
4/27/04
J. M.Raimondi
Laboratory Manager

AREVA

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Lockwood Greene
Attention Carl Jackson

Report Date 04/27/04
Receipt Date 04/05/04

Lockwood Greene
1500 International Drive

Spartanburg, SC 29304

Lab. Sample No. L7165-08 Client ID SS - 16 Product GAMMA SPECTROMETRY
Reference Date 04/01/04 Analysis Date 04/22/04 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/kg)	TPU 1 Sigma (pCi/kg)	Measured MDC (pCi/kg)	Required MDC (pCi/kg)	Flags
AcTh-228	2.01E+02 +/- 1.7E+01	2.0E+01	5.0E+01		bc
Ag-108m	7.3E+00 +/- 3.3E+00	3.4E+00	1.1E+01		
Ag-110m	-4.3E+00 +/- 4.1E+00	4.1E+00	1.7E+01		
Am-241	1.2E+01 +/- 2.7E+01	2.7E+01	9.3E+01		
Ba-140	5.1E+01 +/- 4.3E+01	4.3E+01	1.4E+02		
Be-7	8E+00 +/- 3.9E+01	3.9E+01	1.4E+02		
Ce-141	3E+00 +/- 1.1E+01	1.1E+01	3.7E+01		
Ce-144	-3.5E+01 +/- 2.8E+01	2.8E+01	9.9E+01		
Co-57	-3.5E+00 +/- 3.5E+00	3.5E+00	1.2E+01		
Co-58	3.5E+00 +/- 4.3E+00	4.3E+00	1.5E+01		
Co-60	6.4E+00 +/- 4.1E+00	4.1E+00	1.3E+01	1.5E+02	
Cr-51	6.2E+01 +/- 5.1E+01	5.1E+01	1.7E+02		
Cs-134	-2.1E+01 +/- 1.7E+01	1.7E+01	5.6E+01	1.5E+02	
Cs-137	8.99E+01 +/- 7.8E+00	9.0E+00	1.5E+01	1.5E+02	bc
Fe-59	4E+00 +/- 1.1E+01	1.1E+01	3.9E+01		
I-131	1E+01 +/- 2.2E+01	2.2E+01	7.6E+01		
K-40	3.77E+03 +/- 1.6E+02	2.5E+02	1.2E+02		bc
La-140	-2.8E+01 +/- 2.5E+01	2.6E+01	9.4E+01		
Mn-54	2.5E+00 +/- 4.2E+00	4.2E+00	1.5E+01		
Nb-95	-7E-01 +/- 8.4E+00	8.4E+00	2.9E+01		
Ru-103	-1.7E+00 +/- 5.1E+00	5.1E+00	1.8E+01		
Ru-106	-4.9E+01 +/- 3.6E+01	3.6E+01	1.4E+02		
Sb-124	-2.1E+00 +/- 8.5E+00	8.5E+00	3.4E+01		
Sb-125	1.9E+01 +/- 1.0E+01	1.0E+01	3.3E+01		
Se-75	8E-01 +/- 5.5E+00	5.5E+00	1.9E+01		
Zn-65	1.3E+01 +/- 1.9E+01	1.9E+01	6.3E+01		
Zr-95	-1.51E+01 +/- 7.0E+00	7.1E+00	2.9E+01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

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ENVIRONMENTAL LAB

Approved by
4/27/04
J. M. Raimondi
Laboratory Manager

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Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer
Lockwood Greene
1500 International Drive
Spartanburg, SC 29304
Attn: Carl Jackson

Product TH-230, TH-232

Report Date 04/27/04
Receipt Date 04/05/04

LSN	Client ID & Description	Reference Date	Analysis Date	Nuclide	Activity Concentration +/- 1-Sigma (pCi/kg)	TPU 1 Sigma (pCi/kg)	Measured MDC (pCi/kg)	Required MDC (pCi/kg)	Flags	Reporting Level Ratio
Soil										
L7165-01	SS - 2	04/01/2004	04/20/2004	Th-228	1.46E+02 +/- 1.4E+01	1.5E+01	2.4E+01	1.0E+03	b	
L7165-01	SS - 2	04/01/2004	04/20/2004	Th-230	1.57E+02 +/- 1.4E+01	1.6E+01	2.5E+01	1.0E+03	b	
L7165-01	SS - 2	04/01/2004	04/20/2004	Th-232	2.04E+02 +/- 1.4E+01	1.6E+01	9.2E+00	1.0E+03	b	
L7165-02	SS - 6	04/01/2004	04/20/2004	Th-228	2.07E+02 +/- 1.8E+01	2.0E+01	3.2E+01	1.0E+03	b	
L7165-02	SS - 6	04/01/2004	04/20/2004	Th-230	1.36E+02 +/- 1.5E+01	1.6E+01	3.0E+01	1.0E+03	b	
L7165-02	SS - 6	04/01/2004	04/20/2004	Th-232	1.63E+02 +/- 1.4E+01	1.6E+01	9.1E+00	1.0E+03	b	
L7165-03	SS - 9	04/01/2004	04/20/2004	Th-228	1.54E+02 +/- 1.1E+01	1.3E+01	1.7E+01	1.0E+03	b	
L7165-03	SS - 9	04/01/2004	04/20/2004	Th-230	1.6E+02 +/- 1.1E+01	1.3E+01	1.7E+01	1.0E+03	b	
L7165-03	SS - 9	04/01/2004	04/20/2004	Th-232	1.64E+02 +/- 1.1E+01	1.2E+01	6.3E+00	1.0E+03	b	
L7165-04	SS - 11	04/01/2004	04/20/2004	Th-228	1.75E+02 +/- 1.4E+01	1.5E+01	2.5E+01	1.0E+03	b	
L7165-04	SS - 11	04/01/2004	04/20/2004	Th-230	1.55E+02 +/- 1.2E+01	1.4E+01	2.1E+01	1.0E+03	b	
L7165-04	SS - 11	04/01/2004	04/20/2004	Th-232	1.81E+02 +/- 1.2E+01	1.4E+01	8.3E+00	1.0E+03	b	

Flags:
a The measured MDC is greater than the required MDC.
b The activity concentration is greater than three times its one sigma counting uncertainty.

Approved by
4/27/04
J. M. Raimondi
Laboratory Manager

cc:

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Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer
Lockwood Greene
1500 International Drive
Spartanburg, SC 29304
Attn: Carl Jackson

Product TH-230, TH-232

Report Date 04/27/04
Receipt Date 04/05/04

LSN	Client ID & Description	Reference Date	Analysis Date	Nuclide	Activity Concentration +/- 1-Sigma (pCi/kg)	TPU 1 Sigma (pCi/kg)	Measured MDC (pCi/kg)	Required MDC (pCi/kg)	Flags	Reporting Level Ratio
Soil										
L7165-05	SS - 12	04/01/2004	04/20/2004	Th-228	2.07E+02 +/- 1.5E+01	1.7E+01	2.7E+01	1.0E+03	b	
L7165-05	SS - 12	04/01/2004	04/20/2004	Th-230	1.63E+02 +/- 1.3E+01	1.4E+01	2.0E+01	1.0E+03	b	
L7165-05	SS - 12	04/01/2004	04/20/2004	Th-232	1.96E+02 +/- 1.2E+01	1.4E+01	7.3E+00	1.0E+03	b	
L7165-06	SS - 13	04/01/2004	04/20/2004	Th-228	1.99E+02 +/- 1.4E+01	1.5E+01	1.5E+01	1.0E+03	b	
L7165-06	SS - 13	04/01/2004	04/20/2004	Th-230	1.49E+02 +/- 1.3E+01	1.4E+01	2.2E+01	1.0E+03	b	
L7165-06	SS - 13	04/01/2004	04/20/2004	Th-232	1.94E+02 +/- 1.3E+01	1.5E+01	2.3E+00	1.0E+03	b	
L7165-07	SS - 15	04/01/2004	04/20/2004	Th-228	2.11E+02 +/- 1.5E+01	1.7E+01	2.8E+01	1.0E+03	b	
L7165-07	SS - 15	04/01/2004	04/20/2004	Th-230	1.61E+02 +/- 1.3E+01	1.4E+01	2.1E+01	1.0E+03	b	
L7165-07	SS - 15	04/01/2004	04/20/2004	Th-232	2.07E+02 +/- 1.3E+01	1.5E+01	9.1E+00	1.0E+03	b	
L7165-08	SS - 16	04/01/2004	04/20/2004	Th-228	2E+02 +/- 1.5E+01	1.7E+01	3.0E+01	1.0E+03	b	
L7165-08	SS - 16	04/01/2004	04/20/2004	Th-230	1.83E+02 +/- 1.4E+01	1.5E+01	2.3E+01	1.0E+03	b	
L7165-08	SS - 16	04/01/2004	04/20/2004	Th-232	1.88E+02 +/- 1.3E+01	1.4E+01	1.2E+01	1.0E+03	b	

Flags:
a The measured MDC is greater than the required MDC.
b The activity concentration is greater than three times its one sigma counting uncertainty.

Approved by
4/27/04
J. M. Raimondi
Laboratory Manager

c:

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APR 27 2004
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ENVIRONMENTAL LAB