4 ENVIRONMENTAL IMPACTS

This chapter evaluates the potential environmental impacts associated with the UUSA facility capacity expansion. The chapter is divided into sections that assess the impact to each related resource described in Chapter 3, Description of Affected Environment. These include land use (4.1), transportation (4.2), geology and soils (4.3), as well as water resources (4.4), ecological (4.5), air quality (4.6), noise (4.7), historic and cultural (3.8), and visual/scenic (4.9). Other topics included are socioeconomic (4.10), environmental justice (4.11), public and occupational health (4.12), and waste management (4.13).

4.1 Land Use Impacts

4.1.1 Construction Impacts

The proposed expansion site is already developed by the existing UUSA facility. Additional land use impacts from the expansion will be limited as the site has been cleared and additional construction will occur within previously disturbed areas.

The facility capacity expansion would not result in any conflicts between Federal, State, regional and local (and in the case of a reservation, American Indian tribe) land-use plans, policies and controls because all land use will continue to be within the pre-existing and fenced borders of the UUSA site. The proposed facility capacity expansion would not result in any impacts to land classified as floodplain, wetlands or coastal zone.

The continued land use for the facility capacity expansion would not result in any additional impacts that would prevent current or planned mineral resources exploitation (e.g., sand and gravel, coal, oil, natural gas or ores). None of this activity is currently allowed on the site property, and the land use to support the proposed facility capacity expansion will be limited to the current property.

During the expansion of the UUSA facility, conventional earthmoving and grading equipment will be used. The removal of very dense soil or caliche may require the use of heavy equipment with ripping tools. Soil removal work for foundations will be controlled to reduce over-excavation to minimize construction costs. In addition, loose soil and/or damaged caliche will be removed prior to installation of foundations for seismically designed structures. The maximum anticipated excavation depth for ongoing construction at the UUSA site is 32 feet.

Wildlife on the site is already limited due to the existing facility and currently erected fencing. Any small wildlife will have the opportunity to move to areas of suitable habitat bordering the UUSA site.

The anticipated effects on the soil during the expansion are limited to a potential short-term increase in soil erosion. However, this will be mitigated by the continuing use of proper construction best management practices (BMPs). These practices include minimizing the construction footprint to the extent possible, limiting site slopes to a horizontal to vertical ratio of three to one or less, the use of a sedimentation detention basin, protection of undisturbed areas with silt fencing and straw bales as appropriate, and site stabilization practices such as placing crushed stone on top of disturbed soil in areas of concentrated runoff. In addition, as indicated in Supplemental ER Chapter 5, Mitigation Measures, onsite construction roads will be periodically watered down, if required, to control fugitive dust emissions. Water conservation will be considered when deciding how often dust suppression sprays will be applied. After construction is complete, the site will be stabilized with natural, low-water maintenance landscaping and pavement.

Impacts to land and groundwater will be controlled during the expansion through compliance with the National Pollution Discharge Elimination System (NPDES) Construction General Permit obtained from Region 6 of the Environmental Protection Agency (EPA). BMPs will be used to prevent releases; however, should a release occur, site procedures will identify individuals and their responsibilities for implementation of corrective measures and provide instructions for prompt notifications of state and local authorities, as required.

Waste management BMPs will be used to minimize solid waste and hazardous materials during the construction of the expanded facility. These practices include the placement of waste receptacles and trash dumpsters at convenient locations and the designation of vehicle and equipment maintenance areas for the collection of oil, grease and hydraulic fluids. Where practicable, materials suitable for recycling will be collected. If external washing of construction vehicles is necessary, no detergents will be used, and the runoff will be diverted to onsite retention basins. Adequately maintained sanitary facilities will be provided for construction crews.

4.1.2 Utilities Impacts

The ongoing construction of the UUSA facility to support the proposed facility capacity expansion will not require the installation of additional water and electrical utility lines. Existing potable and sewer water connection exist to support the proposed facility capacity expansion.

Existing and previously upgraded electrical transmission lines on a large loop system are adequate to support the proposed facility capacity expansion. Sanitary wastewater will continue to be sent to the City of Eunice Wastewater Treatment Plant via a system of lift stations and sewage lines. Overall land use impacts to the site and vicinity will be small considering that the majority of the site is developed and operating, the industrial activity on neighboring properties, the nearby expansive oil and gas well fields, and the sufficient existing utility installations. UUSA is not aware of any Federal action that would have cumulatively significant land use impacts.

4.1.3 Cumulative Impacts

As described, the current operation of UUSA is located in a sparsely populated area surrounded by several industrial installations. Land further to the north, south, and west of the site has been mostly developed by the oil and gas industry with hundreds of oil pump jacks and associated rigs. Range cattle are also raised on this land. WCS has been granted a license application for disposal of low-level radioactive wastes approximately 1.6 kilometers (1 mile) east of the UUSA site. Of the 582 hectares (1,438 acres) of the land owned by WCS, 81 hectares (200 acres) are occupied by the existing disposal and waste storage facilities and the disposal cells would occupy an additional 81 hectares (200 acres) (WCS, 2004). This would be in addition to a sanitary landfill, several land farms, and disposal facilities for oil industry wastes operated by others in the area. Other projects considered for cumulative impacts are located more than 10 miles from the UUSA site and would therefore not impact this local resource.

The proposed expansion of UUSA will be confined to construction within the existing property, and would not substantially change the land use in the region. The current local land use is predominantly industrial and no cumulative impacts to this resource are anticipated from UUSA and the activities at the surrounding properties.

4.1.4 Comparative Land Use Impacts of No-Action Scenarios

Supplemental ER Chapter 2, Alternatives, provides a discussion of possible alternatives to the capacity expansion construction and operation of UUSA, including an alternative of "no action," i.e., not expanding the current capacity. The following information provides comparative conclusions specific to the concerns addressed in this subsection for each of the three "no action" alternative scenarios addressed in ER Section 1.2.5 and Table 2.3-2, Comparison of Environmental Impacts for the Proposed Action and the No-Action Scenarios.

While small, all of these No-Action Scenarios will have limited land use impacts at the UUSA site because the pre-construction activities described in Section 1.3.5 and the construction at risk activities described in Section 1.3.6 would still take place.

No-Action Scenario B – No UUSA capacity expansion and no additional enrichment capacity is constructed by others. No additional land use impacts at the UUSA site or at other potential sites.

No-Action Scenario C – No UUSA capacity expansion, facility operates at 3.0 MSWU. Additional enrichment capacity is supplied by a combination of the construction and operation of Eagle Rock in Idaho Falls, ID (proposed capacity 3 MSWU) and GLE in Wilmington, NC (proposed capacity 6 MSWU). The land use resource impact would likely be increased due to construction and clearing on two additional sites. The land use resource impacts for these two additional projects are evaluated in the individual environmental impact statements for the projects.

No-Action Scenario D – No UUSA capacity expansion, facility operates at 3.0 MSWU. Additional enrichment capacity is supplied by a combination of the construction and operation of Eagle Rock in Idaho Falls, ID (proposed capacity 3 MSWU), GLE in Wilmington, NC (proposed capacity 6 MSWU), and ACP in Piketon, OH (planned capacity 3.7 MSWU). The land use resource impact would likely be increased due to construction and clearing on three additional sites. The land use resource impacts for these three additional projects are evaluated in the individual environmental impact statements for the projects.

4.1.5 Section 4.1 Figures

Figure 4.1-1 Site Plan Showing Proposed Facility Capacity Expansion and Undeveloped Areas

4.2 Transportation Impacts

Section 4.2 of the LES ER describes the transportation impacts of constructing and operating the UUSA facility; Section 3.2 of this Supplemental ER describes the current transportation impacts of the existing operations and construction. The impacts to transportation from the expansion will be similar in nature to those created by the initial construction and operation. LES ER Section 4.2 is incorporated by reference; only how the expansion will or will not affect its conclusions is described below.

4.2.1 Construction of Access Road

No additional access roads will be required to support the proposed facility capacity expansion. The existing construction access road will be utilized up to the point of additional UBS Basin construction. At that point the access road will be restored and modified as necessary to accommodate the basin construction. Impacts due to access road construction will be negligible.

4.2.2 Transportation Route

Expansion will not change the routes described in Section 4.2.2 of the LES ER and Section 3.2.2 of this Supplemental ER.

4.2.3 Traffic Pattern Impacts

The expansion will impact local traffic patterns in a way similar to the initial construction and operation of the plant, but with a small increase in traffic due to a slightly larger number of construction and UUSA employees. See LES ER Section 4.2.4. New Mexico Highway 176 already provides direct access to the site. As a main east-west trucking thoroughfare for local industry, it will handle this slight uptick in traffic adequately.

With the expansion and current operations, the UUSA employee workforce will increase to approximately 258 people, up from the 210 evaluated prior to site construction, and slightly higher than the current 250. Thus the maximum potential increase from the impacts initially evaluated to traffic due to UUSA employees is an additional 48 roundtrips per day. This is an upper bound estimate since all workers do not work on any given day. Most vehicles would likely travel west from the site on New Mexico Highway 176, towards the City of Eunice, New Mexico or turn north onto New Mexico Highway 18 towards the City of Hobbs, New Mexico or south towards the city of Jal, New Mexico. Eastbound vehicles would travel from the site on New Mexico Highway 176 and continue on Texas Highway 176.

The maximum potential increase to traffic due to operational deliveries and waste removal will be 4,300 roundtrips per year (see LES ER Section 4.2.3). This value is based on an estimated 1,500 radiological shipments per year plus 2,800 non-radiological shipments per year.

Referring to Table 4.10-1, Estimated Number of Contractors by Annual Pay, the maximum number of contractors will be approximately 1000 during the peak of the expansion construction period, 200 more than estimated in the LES ER. Thus the maximum potential increase to traffic due to contractors is 200 more roundtrips per day. The maximum potential increase to traffic due to construction deliveries and waste removal is 10,318 roundtrips over the ongoing construction period. This value is based on the estimated number of material deliveries and construction waste shipments during the period of ongoing construction. Work shifts will be implemented and carpooling will be encouraged to minimize the impact to traffic due to contractors in the site vicinity.

4.2.4 Construction Transportation Impacts

Impacts from expansion-related construction transportation will include the generation of fugitive dust, changes in scenic quality, and added noise. These impacts will be very similar to those generated during the initial and ongoing construction (see LES ER Section 4.2.4 and Supplemental ER Section 3.2).

Dust will be generated to some degree during the various phases of construction activity. The amount of dust emissions will vary according to the types of activity. Air quality impacts from construction of the UUSA were evaluated using emission factors and air dispersion modeling prior to the initial construction on the site. Emission rates for fugitive dust were calculated using emission factors provided in AP-42, the U.S. Environmental Protection Agency's Compilation of Air Pollutant Emission Factors (EPA, 1995). More detailed discussions of air emissions and dispersion modeling can be found in Supplemental ER Section 4.6.1, Air Quality Impacts from Construction.

For air modeling purposes, emission rates for fugitive dust, as listed in Table 4.6-1, Peak Emission Rates were estimated for construction work hours assuming peak construction activity levels were maintained throughout the year. The calculated Total Work-Day Average Emissions result for fugitive emission particulates is 2.4 g/s (19.1 lbs/hr). Fugitive dust will originate predominantly from vehicle traffic on unpaved surfaces, earth moving, excavating and bulldozing, and to a lesser extent from wind erosion. Fugitive dust emissions were estimated using an AP-42 emission factor for construction site preparation that was adjusted to account for dust suppression measures, and the fraction of total suspended particulate that is expected to be in the range of particulates less than or equal to 10 micrometers (PM10) in diameter.

Emissions were modeled as a uniform area source with emissions occurring during construction work hours throughout the year. PM10 emissions from fugitive dust were also below the National Ambient Air Quality Standards (NAAQS). The results of the fugitive dust estimates should be viewed in light of the fact that the peak anticipated fugitive emissions were assumed to occur throughout the year, and that a reduction in the fugitive dust emissions was assumed for dust suppressant activities. These conservative assumptions will result in predicted air concentrations that tend to overestimate the potential impacts.

As detailed in ER Section 4.7, Noise Impacts, the temporary increase in noise levels along New Mexico Highways 18 and 176 and Texas Highway 176 due to construction vehicles are not expected to impact nearby receptors significantly, due to substantial truck traffic currently using these roadways.

4.2.5 Mitigation Measures

Mitigation measures are described in Section 4.2.5 of the LES ER and are incorporated by reference.

4.2.6 Radioactive Material Transportation

Radioactive material shipments will be transported in packages that meet the requirements of 10 CFR 71 and 49 CFR 173. The Nuclear Regulatory Commission (NRC) has evaluated the environmental impacts resulting from the transport of nuclear materials in NUREG-0170, Final Environmental Statement on the Transportation of Radioactive Material By Air and Other Modes (NRC, 1977a), updated by NUREG/CR-4829, Shipping Container Response to Severe Highway and Railway Accident Conditions (NRC, 1987a). These references include accident scenarios related to the transportation of radioactive material. The NRC found that these accidents have no significant environmental impacts. The materials that will be transported to and from UUSA are within the scope of the environmental impacts previously evaluated by the NRC. Because these impacts have been addressed in a previous NRC environmental impact statement, these impacts do not require further evaluation in this report (NRC, 1977a).

UUSA's processes for transporting radioactive materials and their impacts are comprehensively described in LES ER Section 4.2.7. That section is incorporated by reference; only changes relating to the expansion or to the existing facility's operation will be described in this Supplemental ER.

4.2.6.1 Uranium Feed

The uranium feed for UUSA is natural uranium in the form of uranium hexafluoride (UF_6). No reprocessed uranium is currently used as feed material for the facility. The UF_6 is transported to the facility in 48Y cylinders. These cylinders are designed, fabricated and shipped in accordance with American National Standards Institute (ANSI) N14.1, Uranium Hexafluoride – Packaging for Transport. Feed cylinders are transported to the site by 18-wheeled trucks, one per truck (48Y).

With the expansion to 10 MSWU facility, the total feed shipments are anticipated to range from 350 to 1,365 shipments of feed cylinders per year.

4.2.6.2 Uranium Product

The product of the UUSA facility is transported in 30B cylinders. These cylinders are designed, fabricated and shipped in accordance with the ANSI standard for packaging and transporting UF_6 cylinders, N14.1. Product cylinders are transported from the site to fuel fabrication facilities by modified flatbed truck.

With the expansion, shipment frequency will increase from approximately one shipment every three days to one every one and a half days, or 220 shipments a year, up from 122 per year.

4.2.6.3 Depleted Uranium and Uranium Wastes

Depleted uranium in UBCs will be shipped to conversion or storage facilities via truck in 48Y cylinders similar to feed cylinders. These cylinders are designed, fabricated and shipped in accordance with ANSI N14.1, Uranium Hexafluoride – Packaging for Transport. UBCs will be transported from the site by 18-wheeled trucks, one per truck (48Y). UUSA does not anticipate rail transport will be used to ship UBCs from the site.

With the expansion, the operational capacity for storage, the amount of UBCs generated, and the quantity of anticipated future shipments of UBCs per year will all increase. For the proposed facility capacity expansion, the total operational capacity for storage will be 25,000 cylinders. UBCs will be generated at a maximum rate of 1,250 cylinders per year at the proposed 10 MSWU facility capacity. For purposes of modeling and assessing the transportation impacts shipments of UBCs per year (type 48Y) will range from 185 to 1,390 per year. At present, UBCs will be temporarily stored onsite until conversion facilities are available. The transportation impacts for shipments of depleted uranium have been evaluated for transfers to deconversion facilities either in Paducah, Kentucky, or to the proposed new facility in Hobbs, New Mexico (the International Isotopes Fluorine Products Facility - IIFP). The IIFP site, if constructed and commissioned, will be located approximately 20 miles from the UUSA site (H&A, 2012a). The

Paducah site is more distant and was included to evaluate the potential transportation impacts for shipments to more distant deconversion facilities.

4.2.6.4 Low Level Uranium Wastes

Low level radioactive waste materials are transported in packages by truck via highway in accordance with 10 CFR 71 and 49 CFR 171-173. Detailed descriptions of radioactive waste materials, which will be shipped from the UUSA facility for disposal are presented in Supplemental ER Section 3.12, Waste Management. Supplemental ER Table 4.13-1 presents a summary of the types of waste materials. The number of these waste material packages will increase with the expansion, from approximately 477 fifty-five gallon drums of solid waste annually, to between 1,140 and 1,380. Using a nominal 60 drums per waste truck shipment, approximately 19 to 23 low level waste shipments per year are anticipated with the expansion. Impacts for transportation of the annual generation of these wastes to a potential disposal site located near Clive, UT have been evaluated by modeling (H&A, 2012a). The neighboring WCS facility, which has recently been approved for disposal of these wastes, was not evaluated for transportation impacts, due to the short transportation distance.

4.2.7 Incident-Free Scenario Dose

An evaluation of the impacts associated with the transport of radiological materials for the proposed facility capacity expansion was completed for this Supplemental ER. The assessment evaluated potential impacts during transportation to and from a similar list of facilities as was previously evaluated in prior to the initial site construction. For purposes of the evaluation the following assumptions were made:

- Options to source feed from Port Hope, Ontario, Canada and Metropolis, IL were evaluated. Feed brought to the site will increase to a rate of 1,365 cylinders annually, when the facility completes construction and commissioning of the proposed 10 MSWU capacity. The initial modeling assessment considered a rate of 1,386.
- Product will continue to be delivered to Fuel Fabrication Facilities at Richland, Washington, Columbia, South Carolina, and Wilmington, North Carolina. Product shipments are expected to reach 220 per year based on the proposed facility capacity expansion to 10 MSWU.
- DUF_6 has been evaluated to be transferred to deconversion facilities either in Paducah, Kentucky, or to the proposed new facility in Hobbs, New Mexico (the International Isotopes Fluorine Products Facility - IIFP). The IIFP site, if constructed and commissioned, will be located approximately 20 miles from the UUSA site. The DUF_6 would be placed in Type 48Y cylinders for temporary onsite storage with eventual shipment offsite.
- Radioactive wastes have been evaluated to be transported to one of two disposal locations Energy Solutions in Clive, Utah (formerly Envirocare), and Waste Control Specialists in Andrews County, Texas, which has recently been approved to dispose of Class A, B, and C wastes at the facility neighboring the UUSA location. Because one facility does not require an extended over the road transport, the impacts were assessed for transport to the Clive, Utah facility. Due to the proposed facility capacity expansion to 10 MSWU the quantities of radiological wastes do increase slightly during the operation of the facility.

The transportation impacts modeled and reported are inclusive of additional low level radiological waste generated by the solidification of waste water. This wastewater had previously been evaluated for impacts associated with onsite treatment through evaporative processes. Wastewater will be solidified with grout and both the volume and weight will increase, resulting in approximately 20 additional truckloads of low level waste transported to Clive, Utah, annually. The additional potential impacts due to transport of the solidified waste water have been shown to represent a negligible addition to impacts previously evaluated. The curie inventory for these materials is also slightly different and those changes have been evaluated in the model output.

The impact assessment determines the origin and destination of each type of radioactive material, the amount of material in each shipment, the route to be used, and impacts to the environment from these shipments. The WebTragis and RADTRAN 6 computer codes were used extensively and are discussed in detail (ORNL, 2003; Neuhauser and Kanipe, 2003). The analysis is organized into separate sections that describe the radioactive materials, the shipping routes, the dose assessments, and the results. The radionuclide data and shipping container characteristics for input into RADTRAN 6 were obtained from the U.S. Department of Energy's (DOE's) *A Resource Handbook on DOE Transportation Risk Assessment* (DOE, 2002) and the NRC's NUREG-0170 (NRC, 1977).

UUSA has identified Port Hope in Ontario, Canada as a source of feed material to the Eunice, NM site, and has identified the potential for shipment of enriched uranium from the facility for export to Japan. It is possible that UUSA could also import feed materials from overseas suppliers. This case was previously evaluated in the initial EIS and the impacts were determined to be small. If import or export were to be pursued, UUSA would need to comply with licensing and other requirements for import and export activities in 10 CFR Part 110. Any import or export activity would also need to be conducted in accordance with transportation security requirements in 10 CFR Part 73. Imports and exports would be transported via truck between the seaport and the UUSA facility. East coast or west coast seaports would be utilized. Modeling was completed for the transport of enriched uranium from UUSA to fuel fabrication facilities in Wilmington, North Carolina; Columbia, South Carolina; and Richland, Washington. These analyses are representative of enriched uranium shipments from UUSA to east coast and west coast seaports identified above, because the truck and rail routes that would be used in transporting enriched uranium to these seaports have similar distances and population densities to the routes analyzed for shipments to the domestic fuel fabrication facility destinations.

Table 4.2-1 presents the nonradiological impacts from the shipment of radioactive material. It shows the estimated potential impact in terms of fatalities resulting from traffic accidents. The nonradiological impacts (fatalities from traffic accidents) dominate the impacts for each material-route combination. Fatalities from traffic accidents were estimated to range between 0.0174 individuals per year in Phase 1 to 0.122 per year in Phase 5 (full capacity shipping rates).

Table 4.2-2 presents the radiological impacts in terms of latent cancer fatalities from incident-free transport. Incident-free transport represents the transport of the radioactive shipment without a release from the shipment. Radiological latent cancer fatalities from incident-free transport were estimated to range between 0.00333 individuals per year in Phase 1 to 0.0168 individuals per year in Phase 5.

Table 4.2-3 presents the radiological impacts from accidents during these shipments. Accident results include the impact (risk per year) from various accident scenarios that potentially could occur during the transport of the radioactive material. The results are presented in terms of risk, which means weighting the impact, of the various accident scenarios by the frequency that the accident scenario occurs. Radiological latent cancer fatalities from accidents during shipment range between 0.00314 individuals a year in Phase 1 to 0.0140 individuals per year in Phase 5.

4.2.8 Cumulative Impacts

The ongoing construction, operation, and decommissioning of the UUSA through the proposed facility capacity expansion would result in a small to moderate impact due to traffic from commuting contractors and operational personnel. There will be increased shipments of radiological materials to and from the UUSA facility due to the proposed facility capacity expansion. Cumulative impacts associated with transportation of radiological materials will occur with the recent licensing of the WCS facility as a disposal location, which is nearly adjacent to the UUSA facility. It is anticipated the cumulative impact to the state highway systems that service the facilities (NM176 and TX 176) will be minimal as there is sufficient capacity on these major roadways. No cumulative impact is anticipated due to other energy projects in the vicinity due to existing development in the nearby areas or due to the WIIP project, which is a significant distance from the UUSA site. There are potential cumulative impacts from the proposed construction and operation of the IIFP facility in Hobbs, New Mexico as this facility is anticipated to receive depleted materials from UUSA for deconversion processes. The proposed IIFP site will be located approximately 20 miles from the UUSA site. It is anticipated the IIFP site will also receive depleted materials from other sources along the same or similar transportation routes. The EIS for the IIFP site concluded that the radiological impacts associated with combined Phase 1 and Phase 2 operations at IIFP would result in a total population dose of 1.7 person-Sv (170 person-rem) annually. Statistically, this dose could result in 0.10 LCFs annually. When combined with the radiological transportation impacts from operation of the UUSA facility (0.1 LCFs over the facility life) and radiological transportation impacts from the WIPP (less than 1 LCF annually), the NRC staff found that the cumulative radiological impacts from transportation would be SMALL (less than 1 LCF annually) (IIFP, 2009a). The radiological transportation impacts evaluated for the UUSA proposed facility capacity expansion remain less than 1 LCF annually, and the evaluation of the cumulative impacts from these projects will remain small as evaluated recently by NRC on the IIFP evaluation.

With the implementation of all current and planned or proposed future actions within the vicinity of the existing UUSA facility traffic volumes would contribute to cumulative impacts. However, no changes are anticipated in the small to moderate cumulative effects for nonradiological or radiological transportation.

4.2.9 Comparative Transportation Impacts of No Action Scenarios

Supplemental ER Chapter 2, Alternatives, provides a discussion of possible alternatives to the capacity expansion construction and operation of UUSA, including an alternative of "no action," i.e., not expanding the current capacity. The following information provides comparative conclusions specific to the concerns addressed in this subsection for each of the three "no action" scenarios addressed in ER Section 2.3 and Table 2.3-2, Comparison of Environmental Impacts for the Proposed Action and the No-Action Scenarios.

No-Action Scenario B – No UUSA capacity expansion and no additional enrichment capacity is constructed by others. No additional transportation impacts at the UUSA site or at other potential sites.

No-Action Scenario C – No UUSA capacity expansion, facility operates at 3.0 MSWU. Additional enrichment capacity is supplied by a combination of the construction and operation of

Eagle Rock in Idaho Falls, ID (proposed capacity 3 MSWU) and GLE in Wilmington, NC (proposed capacity 6 MSWU). The transportation impacts would likely be increased due to construction and operation on two additional sites. The transportation impacts for these two additional projects are evaluated in the individual environmental impact statements for the projects.

No-Action Scenario D – No UUSA capacity expansion, facility operates at 3.0 MSWU. Additional enrichment capacity is supplied by a combination of the construction and operation of Eagle Rock in Idaho Falls, ID (proposed capacity 3 MSWU), GLE in Wilmington, NC (proposed capacity 6 MSWU), and ACP in Piketon, OH (planned capacity 3.7 MSWU). The transportation impacts would likely be increased due to construction and operations on three additional sites. The transportation impacts for these three additional projects are evaluated in the individual environmental impact statements for the projects.

4.2.10 Section 4.2 Tables

Table 4.2-1. Nonradiological Fatalities from Truck Transportation

Phase 1	Accidents	Fatalities
Port Hope, ON	1.95E-01	6.25E-03
Metropolis, IL	1.25E-01	3.99E-03
Richland, WA	3.37E-03	1.08E-04
Columbia, SC	2.56E-03	8.19E-05
Wilmington, NC	2.81E-03	8.99E-05
Clive, UT (Solid Waste)	4.80E-01	6.48E-03
Clive, UT (Liquid Waste)	5.55E-04	1.78E-05
Paducah, KY	8.54E-02	3.19E-04
Hobbs, NM	5.55E-04	1.78E-05
Total	**8.95E-01**	**1.74E-02**
Phase 2	**Accidents**	**Fatalities**
Port Hope, ON	4.00E-01	1.28E-02
Metropolis, IL	2.56E-01	8.18E-03
Richland, WA	7.49E-03	2.40E-04
Columbia, SC	5.69E-03	1.82E-04
Wilmington, NC	6.25E-03	2.00E-04
Clive, UT (Solid Waste)	6.15E-01	1.97E-02
Clive, UT (Liquid Waste)	1.60E-03	5.11E-05
Paducah, KY	2.46E-01	7.86E-03
Hobbs, NM	1.60E-03	5.11E-05
Total	**1.54E+00**	**4.92E-02**
Phase 3	**Accidents**	**Fatalities**
Port Hope, ON	4.64E-01	1.49E-02
Metropolis, IL	2.97E-01	9.49E-03
Richland, WA	1.27E-02	4.07E-04
Columbia, SC	9.67E-03	3.09E-04
Wilmington, NC	1.06E-02	3.40E-04
Clive, UT (Solid Waste)	1.01E+00	3.23E-02
Clive, UT (Liquid Waste)	2.50E-03	8.01E-05
Paducah, KY	3.85E-01	1.23E-02
Hobbs, NM	2.50E-03	8.01E-05

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Total	**2.19E+00**	**7.02E-02**
Phase 4	**Accidents**	**Fatalities**
Port Hope, ON	6.22E-01	1.99E-02
Metropolis, IL	3.97E-01	1.27E-02
Richland, WA	1.76E-02	5.63E-04
Columbia, SC	1.34E-02	4.28E-04
Wilmington, NC	1.47E-02	4.70E-04
Clive, UT (Solid Waste)	1.38E+00	4.41E-02
Clive, UT (Liquid Waste)	3.41E-03	1.09E-04
Paducah, KY	5.25E-01	1.68E-02
Hobbs, NM	3.41E-03	1.09E-04
Total	**2.97E+00**	**9.52E-02**
Phase 5	**Accidents**	**Fatalities**
Port Hope, ON	7.74E-01	2.48E-02
Metropolis, IL	4.94E-01	1.58E-02
Richland, WA	2.21E-02	7.07E-04
Columbia, SC	1.68E-02	5.37E-04
Wilmington, NC	1.84E-02	5.90E-04
Clive, UT (Solid Waste)	1.85E+00	5.89E-02
Clive, UT (Liquid Waste)	4.17E-03	1.33E-04
Paducah, KY	6.42E-01	2.05E-02
Hobbs, NM	4.17E-03	1.33E-04
Total	**3.82E+00**	**1.22E-01**

Source: SNL, 2007.

Table 4.6-2. Radiological Latent Cancer Fatalities from Incident-Free Transportation of Radioactive Materials

Phase 1	Crew	Public Off Link	Public On Link	Stops	Loading	Total
Port Hope, ON	3.95E-04	4.69E-05	3.87E-04	6.00E-07	5.53E-05	8.85E-04
Metropolis, IL	2.33E-04	2.43E-05	1.67E-04	9.30E-04	5.53E-05	1.41E-03
Richland, WA	2.04E-06	2.03E-07	2.51E-06	1.24E-05	2.37E-06	1.95E-05
Columbia, SC	1.73E-06	3.15E-07	2.16E-06	8.11E-06	2.37E-06	1.47E-05
Wilmington, NC	1.88E-06	3.32E-07	2.26E-06	9.67E-06	2.37E-06	1.65E-05
Clive, UT (Solid)	4.81E-07	2.97-08	3.26E-07	2.45E-06	3.82E-07	3.16E-06
Clive, UT (Liquid)	9.18E-08	6.27E-09	7.65E-08	5.16E-07	4.02E-08	7.31E-07
Paducah, KY	1.40E-04	8.95E-06	8.15E-05	7.15E-04	1.61E-05	9.61E-04
Hobbs, NM	9.86E-07	1.52E-07	3.85E-07	5.31E-06	1.61E-05	2.29E-05
Total	**7.75E-04**	**8.12E-05**	**6.43E-04**	**3.10E-03**	**1.50E-04**	**3.33E-03**
Phase 2	**Crew**	**Public Off Link**	**Public On Link**	**Stops**	**Loading**	**Total**
Port Hope, ON	8.07E-04	9.60E-05	7.91E-04	6.00E-07	1.31E-04	1.83E-03
Metropolis, IL	4.77E-04	4.98E-05	3.40E-04	1.90E-03	1.31E-04	2.90E-03
Richland, WA	4.74E-06	4.75E-07	5.85E-06	2.89E-05	8.68E-06	4.86E-05
Columbia, SC	4.04E-06	7.37E-07	5.06E-06	1.89E-05	8.68E-06	3.74E-05
Wilmington, NC	4.37E-06	7.75E-07	5.28E-06	2.26E-05	8.68E-06	4.17E-05
Clive, UT (Solid)	4.59E-07	3.13E-08	3.82E-07	2.58E-06	4.02E-07	3.85E-06
Clive, UT (Liquid)	9.18E-08	6.27E-09	7.65E-08	5.16E-07	4.02E-08	7.31E-07
Paducah, KY	3.99E-04	2.56E-05	2.33E-04	2.04E-03	7.24E-05	2.77E-03
Hobbs, NM	2.82E-06	4.34E-07	1.10E-06	1.52E-05	7.24E-05	9.20E-05
Total	**1.70E-03**	**1.74E-04**	**1.38E-03**	**6.93E-03**	**4.33E-04**	**7.72E-03**
Phase 3	**Crew**	**Public Off Link**	**Public On Link**	**Stops**	**Loading**	**Total**
Port Hope, ON	9.37E-04	1.11E-04	9.18E-04	6.00E-07	1.31E-04	2.10E-03
Metropolis, IL	5.53E-04	5.78E-05	3.95E-04	2.21E-03	1.31E-04	3.35E-03
Richland, WA	7.47E-06	7.46E-07	9.19E-06	4.54E-05	8.68E-06	7.15E-05
Columbia, SC	6.35E-06	1.16E-06	7.94E-06	2.97E-05	8.68E-06	5.38E-05
Wilmington, NC	6.87E-06	1.21E-06	8.31E-06	3.55E-05	8.68E-06	6.06E-05
Clive, UT (Solid)	4.82E-07	3.29E-08	4.01E-07	2.71E-06	4.22E-07	4.05E-06
Clive, UT (Liquid)	9.18E-08	6.27E-09	7.65E-08	5.16E-07	4.02E-08	7.31E-07
Paducah, KY	6.26E-04	4.01E-05	3.65E-04	3.20E-03	7.24E-05	4.30E-03
Hobbs, NM	4.42E-06	6.80E-07	1.73E-06	2.38E-05	7.24E-05	1.03E-04
Total	**2.14E-03**	**2.13E-04**	**1.71E-03**	**8.92E-03**	**4.33E-04**	**1.00E-02**

Phase 4	Crew	Public Off Link	Public On Link	Stops	Loading	Total
Port Hope, ON	1.26E-03	1.49E-04	1.23E-03	6.00E-07	1.76E-04	2.81E-03
Metropolis, IL	7.41E-04	7.73E-05	5.29E-04	2.96E-03	1.76E-04	4.48E-03
Richland, WA	1.08E-05	1.08E-06	1.34E-05	6.60E-05	1.26E-05	1.04E-04
Columbia, SC	9.23E-06	1.69E-06	1.16E-05	4.33E-05	1.26E-05	7.84E-05
Wilmington, NC	1.00E-05	1.78E-06	1.21E-05	5.16E-05	1.26E-05	8.80E-05
Clive, UT (Solid)	4.82E-07	3.29E-08	4.01E-07	2.71E-06	4.22E-07	4.05E-06
Clive, UT (Liquid)	9.18E-08	6.27E-09	7.65E-08	5.16E-07	4.02E-08	7.31E-07
Paducah, KY	8.54E-04	5.47E-05	4.98E-04	4.37E-03	9.88E-05	5.88E-03
Hobbs, NM	6.03E-06	9.28E-07	2.36E-06	3.25E-05	9.88E-05	1.41E-04
Total	**2.89E-03**	**2.87E-04**	**2.30E-03**	**1.20E-02**	**5.88E-04**	**1.36E-02**
Phase 5	**Crew**	**Public Off Link**	**Public On Link**	**Stops**	**Loading**	**Total**
Port Hope, ON	1.56E-03	1.86E-04	1.53E-03	6.00E-07	2.19E-04	3.50E-03
Metropolis, IL	9.22E-04	9.63E-05	6.58E-04	3.68E-03	2.19E-04	5.58E-03
Richland, WA	1.36E-05	1.36E-06	1.67E-05	8.25E-05	1.58E-05	1.30E-04
Columbia, SC	1.15E-05	2.10E-06	1.44E-05	5.41E-05	1.58E-05	9.80E-05
Wilmington, NC	1.25E-05	2.21E-06	1.51E-05	6.45E-05	1.58E-05	1.10E-04
Clive, UT (Solid)	5.28E-07	3.60E-08	4.40E-07	2.97E-06	4.62E-07	4.44E-06
Clive, UT (Liquid)	9.18E-08	6.27E-09	7.65E-08	5.16E-07	4.02E-08	7.31E-07
Paducah, KY	1.04E-03	6.68E-05	6.09E-04	5.34E-03	1.21E-04	7.18E-03
Hobbs, NM	7.37E-06	1.14E-06	2.88E-06	3.97E-05	1.21E-04	1.72E-04
Total	**3.57E-03**	**3.56E-04**	**2.85E-03**	**1.49E-02**	**7.28E-04**	**1.68E-02**

Source: SNL, 2007.

Table 4.2-3. Radiological Latent Cancer Fatalities from Accidents during Transportation of Radioactive Materials

Phase 1	Inhaled	Resuspended Soil	Cloud Shine	Ground	Total Risk of LCF
Port Hope, ON	1.85E-03	7.72E-05	5.80E-10	4.11E-08	1.93E-03
Metropolis, IL	6.74E-04	2.82E-05	2.11E-10	1.50E-08	7.02E-04
Richland, WA	1.07E-04	4.47E-06	2.67E-11	1.81E-09	1.12E-04
Columbia, SC	8.19E-05	3.42E-06	2.05E-11	1.39E-09	8.54E-05
Wilmington, NC	8.46E-05	3.53E-06	2.11E-11	1.43E-09	8.81E-05
Clive, UT (Solid Waste)	3.02E-09	1.26E-10	1.52E-14	1.07E-12	3.15E-09
Clive, UT (Liquid Waste)	1.17E-08	4.87E-10	3.66E-15	2.59E-13	1.22E-08
Paducah, KY	2.15E-04	8.98E-06	7.19E-11	5.21E-09	2.24E-04
Hobbs, NM	1.06E-06	4.41E-08	3.53E-13	2.56E-11	1.10E-06
Total	**3.01E-03**	**1.26E-04**	**9.32E-10**	**6.59E-08**	**3.14E-03**
Phase 2	**Inhaled**	**Resuspended Soil**	**Cloud Shine**	**Ground**	**Total Risk of LCF**
Port Hope, ON	3.76E-03	1.57E-04	1.18E-09	8.34E-08	3.91E-03

Metropolis, IL	1.34E-03	5.60E-05	4.20E-10	2.98E-08	1.40E-03
Richland, WA	2.50E-04	1.04E-05	6.24E-11	4.24E-09	2.60E-04
Columbia, SC	1.92E-04	8.01E-06	4.79E-11	3.25E-09	2.00E-04
Wilmington, NC	1.93E-04	8.06E-06	4.81E-11	3.27E-09	2.01E-04
Clive, UT (Solid Waste)	2.36E-07	9.88E-09	7.94E-14	5.36E-12	2.46E-07
Clive, UT (Liquid Waste)	2.10E-05	8.78E-07	7.03E-12	5.10E-10	2.19E-05
Paducah, KY	5.93E-04	2.48E-05	1.99E-10	1.44E-08	6.18E-04
Hobbs, NM	2.79E-06	1.17E-07	9.34E-13	6.77E-11	2.91E-06
Total	**6.35E-03**	**2.66E-04**	**1.96E-09**	**1.39E-07**	**6.69E-03**
Phase 3	**Inhaled**	**Resuspended Soil**	**Cloud Shine**	**Ground**	**Total Risk of LCF**
Port Hope, ON	4.39E-03	1.84E-04	1.38E-09	9.75E-08	4.57E-03
Metropolis, IL	1.60E-03	6.69E-05	5.02E-10	3.54E-08	1.66E-03
Richland, WA	3.93E-04	1.64E-05	9.81E-11	6.65E-09	4.09E-04
Columbia, SC	3.01E-04	1.26E-05	7.50E-11	5.09E-09	3.13E-04
Wilmington, NC	3.10E-04	1.30E-05	7.74E-11	5.25E-09	3.23E-04
Clive, UT (Solid Waste)	4.11E-07	1.71E-08	8.40E-14	5.91E-12	4.28E-07
Clive, UT (Liquid Waste)	1.17E-08	4.87E-10	3.66E-15	2.59E-13	1.22E-08
Paducah, KY	9.64E-04	4.03E-05	3.22E-10	2.34E-08	1.00E-03
Hobbs, NM	4.73E-06	1.98E-07	1.58E-12	1.14E-10	4.93E-06
Total	**7.96E-03**	**3.33E-04**	**2.45E-09**	**1.73E-07**	**8.28E-03**
Phase 4	**Inhaled**	**Resuspended Soil**	**Cloud Shine**	**Ground**	**Total Risk of LCF**
Port Hope, ON	5.89E-03	2.46E-04	1.84E-09	1.31E-07	6.13E-03
Metropolis, IL	2.14E-03	8.94E-05	6.71E-10	4.75E-08	2.23E-03
Richland, WA	5.71E-04	2.39E-05	1.43E-10	9.67E-09	5.95E-04
Columbia, SC	4.38E-04	1.83E-05	1.09E-10	7.40E-09	4.56E-04
Wilmington, NC	4.52E-04	1.88E-05	1.13E-10	7.65E-09	4.71E-04
Clive, UT (Solid Waste)	2.48E-07	1.04E-08	8.34E-14	5.63E-12	2.58E-07
Clive, UT (Liquid Waste)	1.17E-08	4.87E-10	3.66E-15	2.59E-13	1.22E-08
Paducah, KY	1.32E-03	5.49E-05	4.40E-10	3.18E-08	1.37E-03
Hobbs, NM	6.46E-06	2.70E-07	2.16E-12	1.57E-10	6.73E-06
Total	**1.08E-02**	**4.51E-04**	**3.32E-09**	**2.35E-07**	**1.13E-02**
Phase 5	**Inhaled**	**Resuspended Soil**	**Cloud Shine**	**Ground**	**Total Risk of LCF**
Port Hope, ON	7.31E-03	3.05E-04	2.29E-09	1.63E-07	7.62E-03
Metropolis, IL	2.66E-03	1.11E-04	8.36E-10	5.91E-08	2.77E-03
Richland, WA	7.14E-04	2.98E-05	1.79E-10	1.21E-08	7.44E-04
Columbia, SC	5.47E-04	2.28E-05	1.36E-10	9.26E-09	5.70E-04
Wilmington, NC	5.63E-04	2.35E-05	1.41E-10	9.55E-09	5.87E-04
Clive, UT (Solid Waste)	3.66E-09	1.53E-10	1.84E-14	1.30E-12	3.82E-09
Clive, UT (Liquid Waste)	1.17E-08	4.87E-10	3.66E-15	2.59E-13	1.22E-08
Paducah, KY	1.61E-03	6.70E-05	5.37E-10	3.90E-08	1.68E-03
Hobbs, NM	7.88E-06	3.29E-07	2.64E-12	1.91E-10	8.21E-06
Total	**1.34E-02**	**5.60E-04**	**4.12E-09**	**2.92E-07**	**1.40E-02**

Source: SNL, 2007.

4.3 Geology and Soil Impacts

Site geology and physiographic summary for the site area and soils, briefly summarized here, are fully described in Section 3.3, Geology and Soils of the LES ER and this Supplemental ER.

Subsurface geologic materials at the UUSA site generally consist of competent clay red beds, a part of the Chinle Formation of the Triassic-aged Dockum Group. Bedrock is covered approximately *40 feet of dune sand, caliche and sand and gravel alluvium.*

Foundation conditions at the site are generally good and little to no potential for mineral development exists or has been found at the site, as discussed in LES ER Section 3.4.1.1, Major Surface and Subsurface Hydrological Systems.

The site terrain currently ranges in elevation from +3,390 to +3,430 ft mean sea level (msl) (Figure 3.3-1, Site Topographic Map). If needed, select engineered fill material may be brought onsite to achieve the backfill specifications for building footprints and some volume of native soil may be disposed of offsite to maintain a desirable soil stockpile balance. Surface stormwater runoff for the permanent facility are controlled by an engineered system described in LES ER Section 3.4.1.2, Facility Withdrawals and/or Discharges to Hydrologic Systems. Those controls essentially eliminate any potential for discharge of runoff from the UUSA site, including from the expansion.

Expansion construction activities may cause some short-term increases in soil erosion at the site, although rainfall in the region is limited. Erosional impacts due to site clearing and grading will be mitigated by utilization of construction and erosion control BMPs. (See ER Section 4.1, Land Use Impacts, for a discussion of construction BMPs.) Disturbed soils will be stabilized as part of construction work. Earth berms, dikes and sediment fences will be utilized as necessary during all phases of construction to limit runoff. Much of the excavated areas will be covered by structures or paved, limiting the creation of new dust sources. Watering will be used to control potentially fugitive construction dust. Water conservation will be considered when deciding how often dust suppression sprays will be applied. See ER Section 4.4.8, Control of Impacts for Water Quality, for a discussion of water conservation measures.

The Lea County Soils Survey describes soils found at the UUSA site (Figure 3.3-5, Site Soil Survey) as applicable for range, wildlife and recreation areas, and not for any standard agricultural activities (although selected soils are designated as farmlands of statewide importance, no current or anticipated agriculture development is likely at the site or vicinity). Construction and operation of the UUSA plant are thus not anticipated to displace any potential agrarian use.

There would be no cumulative adverse impacts to geology from the UUSA proposed facility capacity expansion as impacts to this resource from this or other projects will be localized to the specific project sites. The UUSA site is located in a region where there has been previous contamination of soils and ground-water aquifers from activities related to the oil and gas industry and this condition is relatively unchanged from the initial evaluations conducted.

4.3.1 Comparative Geology and Soil Impacts of No Action Scenarios

Supplemental ER Chapter 2, Alternatives, provides a discussion of possible alternatives to the capacity expansion construction and operation of the UUSA facility, including an alternative of "no action," i.e., expanding the current capacity. The following information provides comparative conclusions specific to the concerns addressed in this subsection for each of the three "no action" scenarios addressed in ER Section 2.3, Table 2.3-2, Comparison of Environmental Impacts for the Proposed Action and the No-Action Scenarios.

No-Action Scenario B – No UUSA capacity expansion and no additional enrichment capacity is constructed by others. No additional geological or soil impacts at the UUSA site or at other potential sites.

No-Action Scenario C – No UUSA capacity expansion, facility operates at 3.0 MSWU. Additional enrichment capacity is supplied by a combination of the construction and operation of Eagle Rock in Idaho Falls, ID (proposed capacity 3 MSWU) and GLE in Wilmington, NC (proposed capacity 6 MSWU). The geology and soil impacts would be increased due to construction and clearing on two additional sites. The geological and soil resource impacts for these two additional projects are evaluated in the individual environmental impact statements for the projects.

No-Action Scenario D – No UUSA capacity expansion, facility operates at 3.0 MSWU. Additional enrichment capacity is supplied by a combination of the construction and operation of Eagle Rock in Idaho Falls, ID (proposed capacity 3 MSWU), GLE in Wilmington, NC (proposed capacity 6 MSWU), and ACP in Piketon, OH (planned capacity 3.7 MSWU). The geology and soil impacts would be increased due to construction and clearing on three additional sites. The geological and soil resource impacts for these three additional projects are evaluated in the individual environmental impact statements for the projects.

4.4 Water Resource Impacts

Section 4.4 of the LES ER contains a complete discussion of the impacts of construction and operation of the UUSA facility to the site's water resources and is incorporated by reference. That analysis concluded that the potential for negative impacts on the limited water resources are very low due to lack of water presence and formidable natural barriers to any surface or subsurface water occurrences.

This LES ER Section 4.4 analysis continues to apply to the proposed expansion and is incorporated by reference. The proposed facility capacity expansion will have no new impacts or changed impacts to:

- the hydrological system,
- the water quality of surface water and groundwater,
- water availability, or
- ongoing mitigative measures.

Compared to the water consumption estimate of 23.1 million gallons per year evaluated prior to the initial construction, UUSA's 2010 annual water consumption calculation (LES, 2010) indicates a reduced impact to water consumption with the UUSA site using an estimated 15.8 million gallons per year.

4.4.1 Updates to Compliance with Water Resource Regulatory Requirements

With the operation of the UUSA facility and the proposed expansion, UUSA's compliance with water related regulatory requirements has and will change slightly from what was described in Section 4.4 of the LES ER. This section updates that discussion in LES ER Section 4.4.

- *A National Pollutant Discharge Elimination System (NPDES) General Permit for Industrial Stormwater:* This permit is required for point source discharge of stormwater runoff from industrial or commercial facilities to the waters of the state. All new and existing point source industrial stormwater discharges associated with industrial activity require a NPDES Stormwater Permit from the EPA Region 6 and an oversight review by the New Mexico Water Quality Bureau (NMWQB). In 2009, the UUSA submitted a "No Exposure" Certification to the EPA (March 09, 2009), which exempted the site from National Pollution Discharge Elimination System stormwater permitting.
- *NPDES General Permit for Construction Stormwater:* Because ongoing construction at the UUSA site will continue to involve the disturbance of more than 0.4 ha (1 acre) of land, an NPDES Construction General Permit from EPA Region 6 and an oversight review by the New Mexico Water Quality Bureau (NMWQB) are required. UUSA developed a Storm Water Pollution Prevention Plan (SWPPP) and filed a NOI with the EPA, Washington, D.C., at least two days prior to the commencement of construction activities. Updated NOIs and appropriate plans will be maintained through the period of ongoing construction at the site.
- *Groundwater Discharge Permit/Plan:* The NMWQB requires that facilities that discharge an aggregate waste water of more than 7.6 m^3 (2,000 gal) per day to surface impoundments or septic systems apply for and submit a groundwater discharge permit and plan. This requirement is based on the assumption that these discharges have the potential of affecting groundwater. UUSA discharges stormwater to surface impoundments, and sends domestic septic wastes to the City of Eunice Wastewater Treatment Plant under Discharge Permit 1481 (DP-1481). Section 20.6.2.3.3104 NMAC of the New Mexico Water Quality

Control Commission (NMWQCC) Regulations (20.6.2 NMAC) requires that any person proposing to discharge effluent or leachate so that it may move directly or indirectly into groundwater must have an approved discharge permit, unless a specific exemption is provided for in the Regulations.

- *Section 401 Certification:* A Section 401 certification will continue to not be required: by letter dated March 17, 2004, the USACE notified UUSA of its determination that there are no USACE jurisdictional waters at the UUSA site and for this reason the project does not require a 404 permit (USACE, 2004).

The overall UUSA site design relating to discharge of stormwater to site retention/detention basins and initial construction activities is discussed in LES ER Section 4.4. For the proposed facility capacity expansion, construction activities will continue beyond the original completion date of May 2014. The scope of construction will not change, but will continue over three additional phases projected through May 2020. Therefore, the potential water resource impacts due to construction will be spread over the additional period. The evaluation of impacts associated with the proposed facility capacity expansion assumes that annual water usage during construction will not exceed the original amount evaluated prior to the start of construction at the site.

4.4.2 Receiving Waters

With the expansion, the UUSA site will continue not to obtain any water or discharge any process effluents onto the site or into surface waters. Sanitary waste water is sent to the City of Eunice Wastewater Treatment Plant for processing via a system of lift stations and 8-inch sewage lines. Rain runoff from developed portions of the site is collected in retention/detention basins, described previously and in ER Section 3.4, Water Resources. These include the Site Stormwater Detention Basin and the UBC Storage Pad Stormwater Retention Basin. Additional UBC Storage Pad Retention Basins will be constructed to increase volume in support of the facility capacity expansion and the increase in size of the UBC Storage Pad.

Discharge from the Site Stormwater Detention Basin is performed by evaporation and by infiltration into the ground. Discharge from the UBC Storage Pad Stormwater Retention Basins will be by evaporation only.

The UUSA site includes no surface hydrologic features. Groundwater was encountered at depths of 65 to 68 m (214 to 222 ft). Significant quantities of groundwater are only found at a depth over 340 m (1,115 ft) where cover for that aquifer is provided by 323 to 333 m (1,060 to 1,092 ft) of clay, as described in LES ER Section 3.4.15, Groundwater Characteristics.

Due to high evapotranspiration rates for the area, there are not any receiving waters for runoff derived from the UUSA facility other than residual amounts from that collected in the Site Stormwater Detention Basin. At shallower depths vegetation at the site provides highly efficient evapotranspiration processes, as described in LES ER Section 3.4.1.1, Major Surface and Subsurface Hydrological Systems. That natural process removes the major part of stormwater runoff at the site.

Stormwater runoff detention/retention basins for the site, shown in Figure 4.4-1, Site Plan with Stormwater Detention/Retention Basins are designed to provide a means of controlling discharges of rainwater and runoff for about 39 ha (96 acres) of the UUSA site plus an additional 23 acres of UBC Storage Pad area. These areas represent a combined 119 acres of the 220 ha (543 acre) total UUSA site area.

The UBC Storage Pad Stormwater Retention Basins, which exclusively serve the paved, outdoor UBC Storage Pad, is lined to prevent any infiltration, and designed to retain a volume (233,100 m^3 (189 acre-ft)) slightly more than twice that for the 24-hour duration, 100-year frequency storm. The basin configuration allows for radiological testing of water and sediment (see ER Section 4.4.3, Impacts on Surface Water and Groundwater Quality), but the basins will contain no flow outlet. All discharge for the UBC Storage Pad Retention Basins is through evaporation. The current UBC Storage Pad was constructed of reinforced concrete with a minimal number of construction joints, and pad joints were provided with joint sealer and water stops as a leak-prevention measure. The ground surface around the UBC Storage Pad was contoured to prevent rainfall in the area surrounding the pad from entering the pad drainage system. Similar construction techniques will be followed for the additional basin construction.

The existing Site Stormwater Detention Basin is designed with an outlet structure for drainage, as needed. Local terrain serves as the receiving area for this basin. The basin is included in the site environmental monitoring program as described in ER Section 6.1, Radiological Monitoring and ER Section 6.2, Physiochemical Monitoring.

4.4.3 Impacts on Surface Water and Groundwater Quality

The UUSA operation does not obtain any water from the site or discharge process effluents to groundwater and surface waters. Therefore, the expansion is not expected to have any impacts on natural water systems quality due to facility water use.

With the expansion, control of surface water runoff will continue to be required for UUSA ongoing construction activities, covered by the NPDES Construction General Permit. As a result, no significant impacts are expected for either surface water bodies or groundwater.

During UUSA operation, stormwater from the site is collected in a collection system that includes runoff detention/retention basins, as described in ER Section 4.4.2, Receiving Waters and shown in ER Figure 4.4-1, Site Plan with Stormwater Detention/Retention Basins.

No wastes from facility operational systems are discharged to stormwater. UUSA provided an No Exposure Certificate to the EPA (March 09, 2009), which exempted the site from National Pollution Discharge Elimination System stormwater permitting. In addition, stormwater discharges during plant operation are controlled by a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP meets the requirements of U.S. EPA Construction General Permit (CGP) Section 3. The SWPPP identifies all potential sources of pollution that may reasonably be expected to affect the quality of stormwater discharge from the site, describes the practices used to reduce pollutants in stormwater, and assures compliance with the terms and conditions of the CGP.

The UBC Storage Pad Stormwater Retention Basins will collect the runoff water from the UBC Storage Pad. This water runoff has a low potential to contain low-level radioactivity from cylinder surfaces or leaks. Runoff from the pad is currently channeled to a dedicated retention basin that is single-lined with a synthetic fabric with ample soil cover over the liner to prevent surface damage and ultraviolet degradation. This basin is described in ER Section 3.4.1.2, Facility Withdrawal and/or Discharges to Hydrologic Systems. It is suitable to contain at least the volume of water from slightly more than twice the 100-year, 24-hour-frequency rainfall of 15.2 cm (6.0 in). The drainage system includes precast catch basins and concrete trench drains; piping material is high density polyethylene (HDPE) with fused joint construction to prevent leakage. An assessment was made by UUSA that assumed a conservative level of radioactive contamination level on cylinder surfaces and 100% washoff to the UBC Storage Pad Stormwater Retention Basin from a single rainfall event. Results show the level of radioactivity in such a discharge to the basin will be well below the regulatory unrestricted release criteria. Two additional UBC basins will be constructed using similar design considerations as the UBC Storage Pad is expanded.

The UBC Storage Pad Stormwater Retention Basin is provided with a means to sample sediment. Refer to ER Section 6.1, Radiological Monitoring, for more information regarding environmental monitoring of stormwater site detention/retention basins.

4.4.4 Hydrological System Alterations

Excavation and placement of fill will provide the site with a finished level grade of about +1,041 m (+3,415 ft), msl. This work will not require alteration or filling of any surface water features on the site.

No alterations to groundwater systems occurred due to facility construction and none are expected during the proposed facility capacity expansion. Referring to ER Section 3.4 and LES ER Section 3.4.15, since there is no consistent groundwater in the sand and travel layer above the Chinle Formation, it does not provide a likely contaminant pathway in a lateral or vertical direction. Although engineered fill was used during site preparation and was placed against the existing dense sand and gravel layer in some locations, 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. The addition of onsite fill is not expected to alter this situation. Furthermore, the travel time to downstream users through a lateral contaminant pathway would be significant since potential contamination would travel laterally at very small rates, if at all. Groundwater travel through the Chinle clay would be on the order of thousands of years.

4.4.5 Hydrological System Impacts

Due to absence of water extraction, limited effluent discharge from the facility operations, the lack of groundwater in the sand and gravel layer above the Chinle Formation and the considerable depth to groundwater at the UUSA site, no significant impacts are expected for the site's hydrologic systems.

Control of surface water runoff is required for the ongoing UUSA construction activities, covered by the NPDES Construction General Permit. As a result, no significant impacts are expected to either surface or groundwater bodies. Control of impacts from construction runoff is discussed in ER Section 4.4.8, Control of Impacts to Water Quality.

Discharges from the Site Stormwater Detention Basin will be through infiltration and evaporation. Except for small amounts of oil products and grease from onsite traffic, recharged water would not be expected to have any contaminants. The recharged plume dimensions would be 1,000 meters (3,280 feet) wide; 2.85 meters (9.3 feet) deep; 2,850 square meters (30,700 square feet) cross-sectional area perpendicular to flow. Portions of the plume could result in a minor seep at Monument Draw, 4.8 kilometers (3 miles) southwest of the UUSA site.

The volume of water discharged into the ground from the Site Stormwater Detention Basin is expected to be minimal, as evapotranspiration is expected to be the dominant natural influence on standing water.

Operational inflow to the UBC Storage Pad Stormwater Retention Basin is not expected to impact water resources since all of the inflow water is expected to evaporate. Further, this amount is less than was originally evaluated prior to site construction.

4.4.6 Ground and Surface Water Use

The UUSA site does not obtain any water from the site or have any planned surface discharges at the site other than to the retention and detention basins. All potable, process and fire water supply used at the UUSA will be obtained from the Eunice, New Mexico, municipal water system. Wells serving these systems are about 32 km (20 mi) from the site. Average plant water consumption and peak plant water requirements are provided in Table 3.4-5, Average Plant Water Consumption, and Table 3.4-6, Anticipated Peak Plant Water Consumption, respectively.

Site groundwater is not utilized for any reason, and therefore, should not be impacted by routine UUSA operations. The UUSA water supply is obtained from the city of Eunice, New Mexico. Current capacity of the Eunice, New Mexico municipal water supply system is 16,350 m^3/day (4.32 million gpd; 1.6 billion gpy) and current usage, excluding UUSA needs, is 5,600 m^3/day (1.48 million gpd; 540 million gpy). Average and peak potable water requirements for operation of the UUSA were re-evaluated in 2010 and are expected to be approximately 164 m^3/day (43,200 gpd; 15.8 million gpy) and 85 m^3/hr (378 gpm), respectively (LES, 2010). These usage rates are well within the capacity of the water system.

In a groundwater modeling exercise conducted prior to site construction, the NRC simulated 23.1 million gpy water supply by Eunice and Hobbs municipal water systems by assuming groundwater withdrawal would be from a single point approximately 3.2 kilometers (2 miles) northeast of Hobbs. Over a 30-year period (2010-2040), additional drawdown of 0.4 meter (1.2 feet) would be observed at the groundwater withdrawal location associated with the construction of the facility. At 13.7 to 15.3 kilometers (8.5 to 9.5 miles) from the groundwater withdrawal location, drawdown of 0.003 meter (0.01 foot) would be expected associated with the construction and predicted water usage rates for UUSA. Since the water supply was revised downward to 15.8 million gpy, the 30-year drawdown effects due to the continued operation of the facility will likely be less than the previously modeled drawdowns.

For both peak and the normal usage rates, the needs of the UUSA facility should be readily met by the municipal water system. Impacts to water resources onsite and in the vicinity of the UUSA are expected to be negligible.

4.4.7 Identification of Impacted Ground and Surface Water Users

Location of an intermittent surface water feature and groundwater users in the site vicinity including an area just beyond a 1.6-km (1-mi) radius of the site boundary are shown on Figure 3.4-1, Water and Oil Wells in the Vicinity of the UUSA Site. These locations were provided by the Office of New Mexico State Engineer (NMSE) (NMSE, 2003), the Texas Water Development Board (TWDB) (TWDB, 2003) and the United States Geological Survey (USGS) (USGS, 2003a). No producing supply water wells are within 1.6 km (1 mi) of the boundaries of the UUSA site as shown on Figure 3.4-1. However, nearby facilities do have groundwater monitoring wells within this region.

The absence of near-surface groundwater users within 1.6 km (1 mi) from the site and the absence of surface water on the UUSA site prevents any impact to local surface or groundwater users. Due to the lack of process water discharge from the facility to the environment, no impact is expected for these water users.

Effluent discharges are controlled in a way that also prevents any impacts. The locations of the closest municipal water systems for both Eunice and Hobbs are in Hobbs, New Mexico, 32 km (20 mi) north northwest of the site. There is no potential to impact these sources.

4.4.8 Control of Impacts to Water Quality

Recent groundwater quality results do not indicate any current impacts due to site activities (Haley & Aldrich, 2011, 2012a, 2012b). Impacts are not anticipated during future operations and precautions and procedures will remain the same through the proposed facility capacity expansion.

Site runoff water quality impacts will be controlled during ongoing construction by compliance with NPDES Construction General Permit requirements and BMPs described in the site Stormwater Pollution Prevention Plan (SWPPP).

Wastes generated during site construction will be varied, depending on activities in progress. Any hazardous wastes from construction activities will be handled and disposed of in accordance with applicable state regulations. This includes proper labeling, recycling, controlling and protected storage and shipping offsite to approved disposal sites. Sanitary wastes generated at the site are sent to the City of Eunice Wastewater Treatment Plant for processing via a system of lift stations and 8-inch sewage lines.

The need to level the site and improve soil compression for construction has and will continue to require some soil excavation as well as soil fill. Fill placed on the site has the similar characteristics as the existing natural soils thus providing similar runoff characteristics as the natural soils on the site.

During operation, the UUSA's stormwater runoff detention/retention system allows controlled release of site runoff from the Site Stormwater Detention Basin only. Stormwater discharge is periodically monitored in accordance with state and/or federal permits. This system is also used for routine sampling of runoff as described in ER Section 6.1, Liquid Effluent Monitoring. Wastewater reporting meets required levels for all contaminants stipulated in any permit or license required for that activity, including the 10 CFR 20 and the Discharge Permit 1481 (DP-1481). The facility's Liquid Effluent Collection and Treatment System provides a means to control liquid waste within the plant. The system provides for collection, analysis, and processing of liquid wastes for disposal. The State of New Mexico has adopted the U.S. EPA hazardous water regulations (40 CFR Parts 260 through 266, 268 and 270) governing the generation, handling, storage, transportation, and disposal of hazardous materials. These regulations are found in 20.4.l NMAC, "Hazardous Waste Management".

The UBC Storage Pad Stormwater Retention Basins, which serve the UBC Storage Pad, is lined to prevent infiltration. It is designed to retain a volume slightly more than twice that for the 24-hour, 100-year frequency storm. Designed for sampling and radiological testing of the contained water and sediment, these basins have no flow outlet. All discharge is through evaporation.

The Site Stormwater Detention Basin is designed with an outlet structure for drainage. Local terrain serves as the receiving area for this basin. 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. The Site Stormwater Detention Basin also receives runoff from a portion of the site stormwater diversion ditch. The purpose of the diversion ditch is to safely divert surface runoff from the area upstream of the UUSA around the east and west sides of the UUSA structures during extreme precipitation events. There is no retention or attenuation of flow associated with this feature. The east side diverts 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 diverts surface runoff around the site where it continues on as overland flow. Since there are no modifications or attenuation of flows, there are no adverse impacts and no mitigative measures are required.

Mitigation measures are in place to minimize potential impact on water resources. These include employing BMPs and the control of hazardous materials and fuels. In addition, the following controls are also implemented:

- Construction equipment is in good repair without visible leaks of oil, greases, or hydraulic fluids.
- Use of BPMs to prevent spills and releases.
- Use of the BMPs assures stormwater runoff related to these activities will not release runoff into nearby sensitive areas (EPA, 2003g). See ER Sections 4.1.1 and 4.2.5 for construction BMPs.
- BMPs are also used for dust control associated with excavation and fill operations during construction. Water conservation is considered when deciding how often dust suppression sprays is applied (EPA, 2003g).
- Silt fencing and/or sediment traps are used.
- External vehicle washing (no detergents, water only).
- Stone construction pads are placed at entrance/exits if unpaved construction access adjoins a state road.
- All temporary construction and permanent basins are arranged to provide for the prompt, systematic sampling of runoff in the event of any special needs.
- Water quality impacts are controlled during construction by compliance with the National Pollution Discharge Elimination System – General Permit requirements and by applying BMPs as detailed in the site Stormwater Pollution Prevention (SWPP) plan.
- A procedure has been implemented for the reporting and response to releases and spills.
- All above-ground diesel storage tanks are bermed.
- Any hazardous materials are handled by approved methods and shipped offsite to approved disposal sites. Sanitary wastes generated during site construction are handled plant sanitary facilities, which discharge to the City of Eunice municipal system.
- The UUSA Liquid Effluent Collection and Treatment System provides a means to control liquid waste within the plant including the collection, analysis, and processing of liquid wastes for disposal.

- Control of surface water runoff occur for activities covered by the EPA Region 6 NPDES Construction General Permit.
- The UUSA is designed to minimize the use of natural and depletable water resources as shown by the following measures:
  - The use of low-water consumption landscaping versus conventional landscaping reduces water usage.
  - The installation of low flow toilets, sinks and showers reduces water usage when compared to standard flow fixtures.
  - Localized floor washing using mops and self-contained cleaning machines reduces water usage compared to conventional washing with a hose twice per week.
  - Closed-loop cooling systems (chillers) have been incorporated in the proposed facility capacity expansion to reduce water usage.

4.4.9 Cumulative Impacts on Water Resources

There has been regional groundwater contamination from the oil and gas industry activities. Sundance Services, Inc., has a ground-water monitoring well network to monitor for possible future offsite contamination resulting from its own operations. As with potential soil contamination, potential groundwater contaminants from its activities would be in the form of hydrocarbons. Any potential contamination resulting from the proposed UUSA facility capacity expansion would most likely be radioactive in nature. There have been no incidents to date from the operating UUSA which have resulted in any soil or groundwater contamination. All liquid effluents are managed either through discharge to offsite treatment and disposal or in the case of stormwater, through collection and evaporation. The potential cumulative impact of nearby facilities on local water resources is accounted for through consideration of the Eunice and Hobbs municipal water-supply systems. The additional incremental UUSA water use under the proposed facility capacity expansion would continue to be a small percentage of the systems' capacity. Forecasts predict that long term future regional water demand, if unrestrained, would deplete current regional supplies and, if required, UUSA and other local facilities would be expected to comply with the Lea County Drought Management Plan.

WCS estimates that the construction of the two disposal cells (i.e., a Federal disposal cell and a Texas compact disposal cell) would require approximately 3,785 cubic meters (1 million gallons) of water to be obtained either from the onsite well or would be brought in from offsite (WCS, 2004). During operation of the disposal cells, WCS projects that there would be no changes in water use from their current levels. Since UUSA will not rely on groundwater sources during construction or operations, no cumulative impacts from the UUSA expansion and WCS construction are expected to groundwater resources.

For the proposed IIFP in Hobbs, approximately 3.79 m3/day (1,000 gal/day) of groundwater would be required during Phase 2 construction, mainly for dust suppression control, fill compaction, and concrete formation. Average and peak site water requirements for Phase 2 operations are expected to be approximately 11.36 m3/day (3,000 gal/day) and 37.85 m3/day (10,000 gal/day), respectively. Phase 2 facility operation would require relatively low volumes of water because it would recycle process water and re-circulate cooling water. Groundwater use during operation is projected to be less than 37,854 L (10,000 gal) per day (IIFP, 2011a), and would be below the water allotment set aside by Lea County. In the IIFP EIS, the NRC staff concluded that cumulative impacts to groundwater use from preconstruction of the proposed IIFP facility, the proposed action and Phase 2 construction and operation would be small.

Potable water to the project would be supplied through the Eunice water system and no impacts are anticipated. The cumulative impacts of the UUSA proposed expansion and the construction and operation of the IIFP facility to local water resources, both to groundwater and municipal supplies would be SMALL.

4.4.10 Comparative Water Resources Impacts of No Action Scenarios

Supplemental ER Chapter 2, Alternatives, provides a discussion of possible alternatives to the capacity expansion construction and operation of UUSA, including an alternative of "no action," i.e., not expanding the current capacity. The following information provides comparative conclusions specific to the concerns addressed in this subsection for each of the three "no action" scenarios addressed in ER Section 2.3 and Table 2.3-2, Comparison of Environmental Impacts for the Proposed Action and the No-Action Scenarios.

No-Action Scenario B – No UUSA capacity expansion and no additional enrichment capacity is constructed by others. No additional water resource impacts at the UUSA site or at other potential sites.

No-Action Scenario C – No UUSA capacity expansion, facility operates at 3.0 MSWU. Additional enrichment capacity is supplied by a combination of the construction and operation of Eagle Rock in Idaho Falls, ID (proposed capacity 3 MSWU) and GLE in Wilmington, NC (proposed capacity 6 MSWU). The water resource impact would likely be increased due to construction and clearing on two additional sites. The water resource impacts for these two additional projects are evaluated in the individual environmental impact statements for the projects.

No-Action Scenario D – No UUSA capacity expansion, facility operates at 3.0 MSWU. Additional enrichment capacity is supplied by a combination of the construction and operation of Eagle Rock in Idaho Falls, ID (proposed capacity 3 MSWU), GLE in Wilmington, NC (proposed capacity 6 MSWU), and ACP in Piketon, OH (planned capacity 3.7 MSWU). The water resource impact would likely be increased due to construction and clearing on three additional sites. The water resource impacts for these three additional projects are evaluated in the individual environmental impact statements for the projects.

4.4.11 Section 4.4 Figures

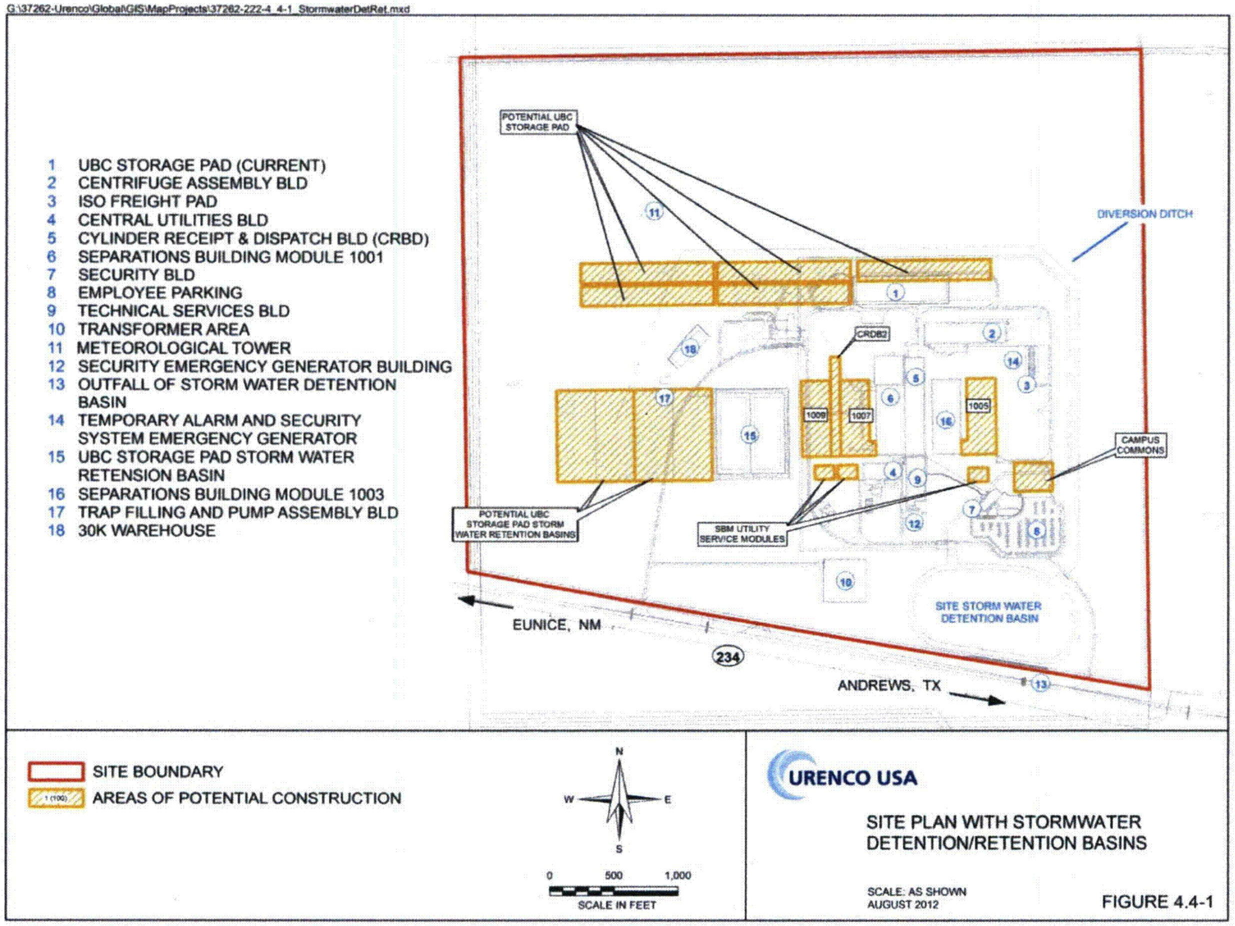

Figure 4.4-1 Site Plan with Stormwater Detention/Retention Basins

4.5 Ecological Resources Impacts

Sections 3.5 and 4.5 of the LES ER describe the ecological resources of the UUSA site and expected impacts to these resources by the initial construction and operation. While some minimal additional clearing of ground vegetation may be required during each construction phase of the UUSA facility capacity expansion, the currently proposed expansion will only use already-disturbed land within the existing footprint of the facility. Supplemental ER Figure 4.5-1, Ecological Resource Impacts Area, shows the site boundary and area of current site construction and operation, and additional construction and operations for the facility capacity expansion. See also Figure 1.3-4, Facility Layout.

Given that the construction will take place on these already (and recently) disturbed areas, the expansion will not create any new or additional impacts to ecological resources, including communities or habitats defined as rare or unique, to areas that support threatened and endangered species, or to species newly identified as New Mexico Department of Fish and Game Rare, Threatened, or Endangered (RTE) species (see Table 3.5-1).

There would be no cumulative adverse impacts to ecological resources as the impacts from the proposed UUSA facility capacity expansion would be restricted to the site, and the UUSA site takes up a negligible percentage of the habitat surrounding the site, thereby not noticeably changing the cumulative impacts already existing from other local and regional activities.

Section 4.5 of the LES ER is thus incorporated by reference to this Supplemental ER.

4.5.1 Comparative Ecological Resource Impacts of No Action Scenarios

Supplemental ER Chapter 2, Alternatives, provides a discussion of possible alternatives to the capacity expansion construction and operation of UUSA, including an alternative of "no action," i.e., not expanding the current capacity. The following information provides comparative conclusions specific to the concerns addressed in this subsection for each of the three "no action" scenarios addressed in ER Section 2.3 and Table 2.3-2, Comparison of Environmental Impacts for the Proposed Action and the No-Action Scenarios.

No-Action Scenario B – No UUSA capacity expansion and no additional enrichment capacity is constructed by others. No additional ecological impacts at the UUSA site or at other potential sites.

No-Action Scenario C – No UUSA capacity expansion, facility operates at 3.0 MSWU. Additional enrichment capacity is supplied by a combination of the construction and operation of Eagle Rock in Idaho Falls, ID (proposed capacity 3 MSWU) and GLE in Wilmington, NC (proposed capacity 6 MSWU). The ecological resource impact would be increased due to construction and clearing on two additional sites. The ecological resource impacts for these two additional projects are evaluated in the individual environmental impact statements for the projects.

No-Action Scenario D – No UUSA capacity expansion, facility operates at 3.0 MSWU. Additional enrichment capacity is supplied by a combination of the construction and operation of Eagle Rock in Idaho Falls, ID (proposed capacity 3 MSWU), GLE in Wilmington, NC (proposed capacity 6 MSWU), and ACP in Piketon, OH (planned capacity 3.7 MSWU). The ecological resource impact would be increased due to construction and clearing on three additional sites. The ecological resource impacts for these three additional projects are evaluated in the individual environmental impact statements for the projects.

4.5.2 Section 4.5 Figures

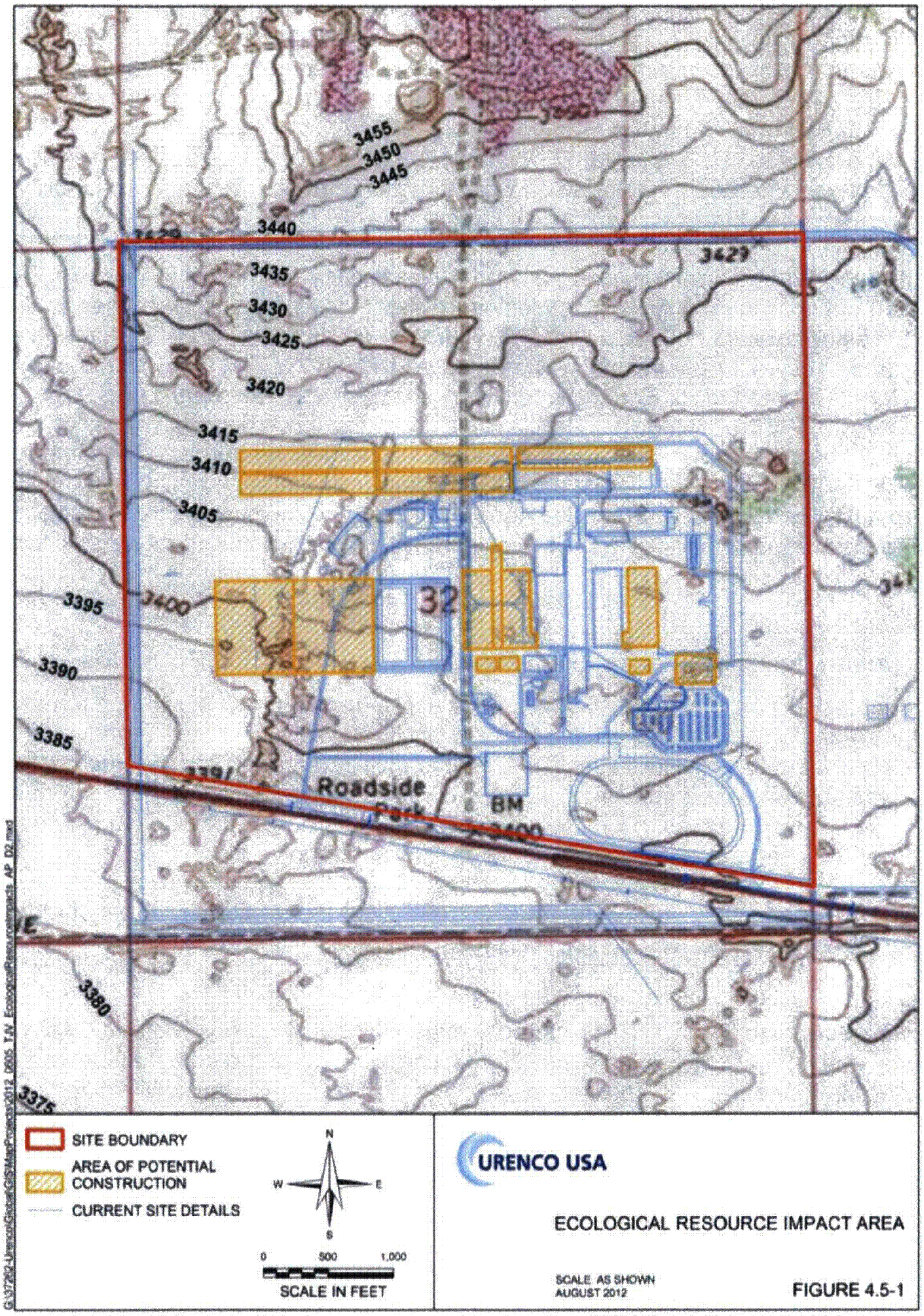

Figure 4.5-1 Ecological Resource Impact Area

4.6 Air Quality Impacts

This section describes the air quality impacts of the proposed expansion up through a facility capacity of 10 MSWU. Section 4.6 of the LES ER described the air quality impacts of the initial construction and operation. That section is updated below to reflect the air quality impacts of the proposed expansion.

4.6.1 Air Quality Impacts from Construction

Air quality impacts from site preparation for the UUSA facility were evaluated prior to site construction using emission factors and air dispersion modeling. The construction of the additional expansion will be similar and will involve construction on previously disturbed areas of the site. Emission rates of Clean Air Act Criteria Pollutants and non-methane hydrocarbons (a precursor of ozone, a Criteria Pollutant) were estimated for exhaust emissions from construction vehicles and for fugitive dust using emission factors provided in AP-42, the U.S. Environmental Protection Agency's Compilation of Air Pollutant Emission Factors (EPA, 1995). The total emission rates were used to scale the output from the Industrial Source Complex Short-Term (ISCST3) air dispersion model (air concentrations derived using a unit source term) to estimate both short-term and annual average air concentrations at the facility property boundary. ISCST3 is a refined, U.S. EPA-approved air dispersion model in the Users Network for Applied Modeling of Air Pollution (UNAMAP) series of air models (EPA, 1987). It is a steady-state Gaussian plume model that can be used to estimate ground-level air concentrations from industrial sources out to a distance of 50 km (31 mi). The air emissions calculations and air dispersion modeling are discussed in more detail in LES ER Chapter 12, Appendix B Air Quality Impacts of Construction Site Preparation Activities.

Emission rates from vehicle exhaust and fugitive dust, as listed in Table 4.6-1, Peak Emission Rates, were estimated for construction work hours assuming peak construction activity levels were maintained throughout the year. Fugitive dust will originate predominantly from vehicle traffic on unpaved surfaces, earth moving, excavating and bulldozing, and to a lesser extent from wind erosion. Fugitive dust emissions were estimated using an AP-42 emission factor for construction site preparation that was adjusted to account for dust suppression measures and the fraction of total suspended particulate that is expected to be in the PM10 range. It was assumed that no more than 18 ha (45 acres) would be involved in construction work at any one time.

Of the combustion sources, vehicle exhaust will be the dominant source. Fugitive volatile emissions will also occur because vehicles will be refueled onsite. Estimated vehicles that will be operating on the site during construction consist of two types: support vehicles and construction equipment. Detailed air quality impact evaluation assumptions, including types and numbers of support vehicles and construction equipment, are given in Chapter 12 of the initial LES ER, Appendix B Air Quality Impacts of Construction Site Preparation Activities. Emission factors in AP-42 for "highway mobile sources" were used to estimate emissions of criteria pollutants and non-methane hydrocarbons for support vehicles. Emission factors are also provided in AP-42 for diesel-powered construction equipment that will be operating on the site during peak construction.

Emissions were modeled in ISCST3 as a uniform area source with emissions occurring during construction work hours, throughout the year. The maximum predicted air concentrations at the site boundary for the various averaging periods predicted using five years (1987 to 1991) of hourly meteorological data from the Midland-Odessa, Texas, National Weather Service (NWS) station are presented in ER Table 4.6-2, Predicted Property Boundary Air Concentrations and

Applicable NAAQS. These concentrations are compared to the appropriate National Ambient Air Quality Standard (NAAQS). No NAAQS has been set for hydrocarbons; however, the total annual emissions of hydrocarbons predicted from the site (approximately 4,535 kg (5 tons)) are well below the level of 36,287 kg (40 tons) that defines a significant source of volatile organic compounds (40 CFR 50.21). Air concentrations of the Criteria Pollutants predicted for vehicle emissions were all at least an order of magnitude below the NAAQS. PM10 emissions from fugitive dust were also below the NAAQS. The results of the fugitive dust estimates should be viewed in light of the fact that the peak anticipated fugitive emissions were assumed to occur throughout the year. These conservative assumptions will result in predicted air concentrations that tend to overestimate the potential impacts. ER Section 1.4.2, State Agencies, presents information regarding the status of all State of New Mexico permits.

Other onsite air quality impacts will occur due to the construction work, such as portable generator exhaust, air compressor exhaust, welding torch fumes, and paint fumes. Since UUSA will continue to be constructed using a phased construction plan, some of the facility will be operational while construction continues. As such, other air quality impacts will occur due to the operation of standby diesel generators. Construction emission types, source locations, and emission quantities are presented in Table 4.6-3, Construction Emission Types.

During the ongoing period of site preparation and major building construction, offsite air quality will be impacted by passenger vehicles with contractors 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. Emission factors are based on AP-42. The resulting emission factors, tons of daily emissions, number of vehicles and heavy duty engines are provided in Table 4.6-4, 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 4.6-4, that are based on the average number of trucks could be about an order of magnitude higher on the peak days.

4.6.2 Air Quality Impacts from Operation

During operation, offsite air quality will be impacted by passenger vehicles with UUSA workers commuting to the site, delivery trucks, UF_6 cylinder shipment trucks, and waste removal trucks. Prior to construction 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. It was assumed that there are 250 workdays per year (five-day work week and fifty-week work year). Emission factors are based on AP-42. The resulting emission factors, tons of daily emissions, number of vehicles and heavy duty engines are provided in Table 4.6-6, Offsite Vehicle Air Emissions During Operations. With a slightly higher total employee count of 258 at the proposed expansion, these emissions would increase slightly but remain insignificant.

NUREG-1748 requires that atmospheric dispersion factors (X/Q's) be used to assess the environmental effects of normal plant operations and facility accidents. In the following subsections, information is presented about the gaseous effluents, the gaseous effluent control systems, and computer models and data used to calculate atmospheric dispersion and deposition factors.

4.6.2.1 Description of Gaseous Effluents

Uranium hexafluoride (UF_6) will be the radioactive effluent for gaseous pathways. Average source term releases to the atmosphere are estimated to be 29.7 MBq (800 µCi) per year for the purposes of bounding routine operational impacts. URENCO's experience in Europe indicates that uranium discharges from gaseous effluent vent systems are less than 10 g (0.35 ounces) per year. Therefore, 29.7 MBq (800 µCi) is a very conservative estimate and is based upon an NRC estimate (NRC, 1994a) for a 1.5 MSWU plant that UUSA has proportioned for the 10 MSWU UUSA.

Nonradioactive gaseous effluents include HF and products of combustion. The proposed expanded facility would release approximately 1.2 kilograms (2.7 pounds) per year of hydrogen fluoride and 0.012 kilograms (0.027 pounds) per year of uranium. These are compared to approximately 1 kilogram (2.2 pounds) per year of hydrogen fluoride and 0.01 kilograms (0.022 pounds) per year of uranium from the existing operation and the values of the annual gaseous release of 10 grams (0.022 pounds) of uranium evaluated in the initial EIS. The emission rates are estimated based on operating experience at other global URENCO enrichment facilities. In addition, there will be six diesel generators onsite for use as standby power sources. Three diesel generators will be added during the proposed facility expansion to accommodate the back-up power needs at the new SBMs (1005, 1007, 1009). However, the use of these diesel generators will be administratively controlled (i.e., only run a limited number of hours per year) and are exempt from air permitting requirements of the State of New Mexico.

Effluent monitoring began in January of 2009 and the results routinely reported to the NRC in the Semi-Annual Radioactive Effluent Release Reports (SARERR).

- UUSA Semi-Annual Radioactive Effluent Release Report Jan 09 through Jun 09 dated August 26, 2009 (NEF-09-00164-NRC)
- UUSA Semi-Annual Radioactive Effluent Release Report Jul 09 through Dec 09 dated February 26, 2010 (LES-10-00042-NRC)
- UUSA Semi-Annual Radioactive Effluent Release Report Jan 10 through Jun 10 dated September 24, 2010 (LES-10-00202-NRC)
- UUSA Semi-Annual Radioactive Effluent Release Report Jul 10 through Dec 10 dated February 23, 2011 (LES-11-00014-NRC)
- UUSA Semi-Annual Radioactive Effluent Release Report Jan 11 through Jun 11 dated August 24, 2011 (LES-11-00121-NRC)
- UUSA Semi-Annual Radioactive Effluent Release Report Jul 11 through Dec 11 dated March 1, 2012 (LES-12-00031-NRC)
- UUSA Semi-Annual Radioactive Effluent Release Report Jan 12 through Jun 12 dated August 20, 2012 (LES-12-00130-NRC)

During periods for which URENCO USA has had Uranium Hexafluoride (UF_6) on site (beginning with 1st quarter 2009) there has not been a detectable release of Uranic material in excess of the Lower Limits of Detection (LLD) or Minimum Detectable Activity (MDA) in the Liquid or

Gaseous Effluents that are routinely monitored. It should be noted that the current waste stream volume is well below projections due to the Cylinder Receipt and Dispatch Building (CRDB) Chemistry Laboratories becoming operational only recently (February 2013). The Decontamination Systems are not yet approved for operation, and is a contributing factor to the limited waste stream volume.

Existing emissions of criteria pollutants from standby diesel generators, 12 cooling towers and five diesel fuel tanks would be increased due to the addition of three emergency generators and associated diesel fuel storage for the proposed facility capacity expansion. Additional emissions from these units would be minor as they will not operate unless there is need for emergency power to the new buildings.

4.6.2.2 Description of Gaseous Effluent Vent System

The principal function of the Gaseous Effluent Vent System (GEVS) is to protect both the operator during the connection/disconnection of uranium hexafluoride (UF_6) process equipment, and the environment, by collecting and cleaning all potentially hazardous gases from the plant prior to release to the atmosphere. Releases to the atmosphere will be in compliance with regulatory limits.

The stream of air and water vapor drawn into the GEVS can have suspended within it uranium hexafluoride (UF_6), (HF, oil and uranium particulates (mainly UO_2F_2)). Online instrument measurements will provide a continuous indication to the operator of the quantity of radioactive material and HF in the emission stream. This will enable rapid corrective action to be taken in the event of any deviation from the normal operating conditions.

There are three types of Gaseous Effluent Vent Systems for the plant: (1) the Pumped Extract GEVS (2) Local Extract GEVS and (3) the CRDB GEVS. In addition, the Centrifuge Test and Post Mortem Facilities have an exhaust filtration system that serves the same purpose as the other GEVS. The Pumped Extract GEVS is installed in the SBM-1001 with the CRDB Local Extract system providing local extract services to the SBM-1. Pumped Extract and Local Extract are included in all later SBMs. to support the facility capacity expansion. For these systems sub-atmospheric pipework system transports potentially contaminated gases to a set of redundant filter stations (containing pre-filters, HEPA filters, and impregnated activated carbon filters) and fans. The cleaned gases are discharged to the atmosphere via a monitored stack on the SBM. All the GEVS utilize variable-speed fans, which will maintain an almost constant sub-atmospheric pressure in front of the filter sections by means of a differential pressure controllers.

The CRDB GEVS is a large airflow unit serving the CRDB Bunker decontamination facilities and fume hoods. The CRDB GEVS and CRDB Local Extract GEVS systems exhaust through monitored stacks on the roof of the existing CRDB. No emissions units are associated with the proposed construction and operation of an additional CRDB associated with SBMs 1007 and 1009. The Centrifuge Test and Post Mortem Exhaust Filtration System Consists of a fan/filter unit that exhausts through a monitored stack on the roof of the Centrifuge Assembly Building (CAB).

Instrumentation is provided to detect and signal via alarm all non-routine process conditions so that the processes can be returned to normal by automatic or local operator actions. Trip actions from the same instrumentation automatically put the systems into a safe condition.

4.6.2.3 Calculation of Atmospheric Dispersion and Deposition Factors

NUREG-1748 requires that atmospheric dispersion factors (X/Q's) be used to assess the environmental effects of normal plant operations and facility accidents. In the absence of onsite meteorological data, the analysis may be conducted using data from 5-year NWS summaries, provided applicability of these data to the proposed site is established. The X/Q's had previously been calculated using meteorological data from Midland-Odessa, Texas (1987 to 1991) and the XOQDOQ dispersion computer program listed in NUREG/CR-2919. Use of the Midland-Odessa data for predicting the dispersion of gaseous effluents was deemed appropriate. Midland-Odessa, Texas is the closest first-order NWS station to the UUSA site and both Midland-Odessa and the UUSA site have similar climates. A first-order weather data source is one that is a major weather station staffed by NWS personnel. For the evaluation of impacts due to the proposed facility capacity expansion to 10 MSWU, the output from the onsite meteorology instrumentation for the year 2011 was used in the modeling.

The NRC computer program XOQDOQ is intended to provide estimates of atmospheric transport and dispersion of gaseous effluents in routine releases from nuclear facilities. XOQDOQ implements NRC Regulatory Guide 1.111 and has been used by the NRC staff in their independent meteorological evaluation of routine airborne radionuclide releases.

XOQDOQ is based on the theory that material released to the atmosphere will be normally distributed (Gaussian distribution) about the plume centerline. In predicting concentrations for longer time periods, the horizontal plume distribution is assumed to be evenly distributed within the directional sector, the so-called sector average model. A straight-line trajectory is assumed between the point of release and all receptors.

The EPA computer program STAR (STability ARray) was used during initial evaluations to produce joint frequency distributions. The STAR program processes NWS meteorological data to generate joint frequencies of six wind speeds, sixteen wind directions, and six stability categories (Pasquill – Gifford stability classes A through F) for the station and time period provided as input, one year at a time.

Distances to the site boundary were determined using guidance from NRC Regulatory Guide 1.145 (NRC, 1982b). The distance to the nearest resident was determined using global positioning system (GPS) measurements.

Annual average atmospheric dispersion and deposition factors for the site boundary, nearest resident, and nearest business and school are presented in LES ER Table 4.6-3A, Annual Average Atmospheric Dispersion and Deposition Factors from NWS (1987 to 1991) Data. The highest site boundary X/Q was 1.0×10^{-5} s/m^3 in the south sector. The nearest resident χ/Q was 2.0×10^{-7} s/m^3 at a distance of 4.3 km (2.63 mi) in the west sector. Tables 4.6-3B through 4.6-3D present atmospheric dispersion and deposition factors out to 80 km (50 mi).

The X/Q for the Centrifuge Assembly Building has been calculated following a similar methodology to the X/Q's calculated for the other facilities at UUSA. The difference being the meteorological conditions for the CAB use a generic assumption of Pasquill Stability Class F with a wind speed of 0.6 m/s and no precipitation to calculate the X/Q for a ground level release. This assumption is highly conservative and represents conditions beyond the 95th percentile 5-year site specific meteorological conditions. A correction factor for X/Q from ARCON96 is assumed for low wind speed correction in the enhanced dispersion model.

An air quality impact analysis was performed to predict maximum ambient impacts of hydrogen fluoride (HF) and uranium (U) emissions from the proposed facility capacity expansion of the URENCO USA (UUSA) facility.

AERMOD (Version 12060), incorporating Plume Rise Model Enhancement (PRIME) downwash algorithms was used in this refined modeling analyses for flat, elevated and complex terrain. The AERMOD model was run using the Lakes Environmental AERMOD View (version 7.6.1) interface for EPA's AERMOD model.

Default AERMOD control options were used in the modeling analysis consistent with EPA recommendations, including the following:

- Stack-tip downwash
- Incorporate effects of elevated terrain
- Calm wind processing routine
- Missing data processing routine
- Default wind profile exponents
- Default vertical potential temperature gradients

For the refined modeling analysis, a non-uniform polar grid receptor network was set up in AERMOD using rings of receptors spaced at 10-degree intervals on 36 radials originating at the approximate center of the modeled stacks. Receptor rings were defined at the following distances in meters from the origin:

- 0 – 2 km with 50 meter spacing
- 2 – 5 km with 100 meter spacing
- 5 – 10 km with 500 meter spacing
- 10 – 15 km with 1,000 meter spacing

Terrain elevations at each of the receptor points were specified by importing a USGS National Elevation Dataset (NED GeoTIFF) terrain data file covering the modeling domain into the Lakes AERMOD View™ interface. As of March 19, 2009, USGS NED GeoTIFF is the terrain data set recommended by the US EPA for use in the United States for regulatory purposes. The 1/3 arc second (10 meter spatial resolution) NED elevation GeoTIFF file was obtained for the modeling domain from the USGS Seamless Data Server. Through this data resource, the user defines a domain for downloading through various options, and can download a single file to cover the entire modeling domain. The inverse distance method was used in AERMAP to process the terrain data and to select the elevation at each receptor. This method, as recommended by Lakes Environmental in its AERMOD View™ User's Guide for non-gridded and gridded receptors, involves interpolation of neighboring points using inverse distance to obtain elevation at the desired points.

The total amount of each criteria pollutant from the existing and proposed facility capacity expansion is less than 91 metric tons (100 tons) per year. In addition, potential emissions of hydrogen fluoride and uranium (both listed as federal hazardous air pollutants) would be below applicable major source levels (9.1 metric tons [10 tons] per year of a single and 22.7 metric tons [25 tons] per year of any combination of federal HAPs). Therefore, neither the existing nor expanded operation would be classified as a major source or required to obtain an operating permit subject to 20.2.70 NMAC.

Although emissions of ethanol and methylene chloride were evaluated during the initial EIS these materials are not used at the current UUSA and are not proposed for use during the proposed facility capacity expansion and will not be emissions from the location.

Separate AERMOD model runs were performed to predict maximum 8-hour average ambient impacts due to U and HF emissions from the six process stacks from the proposed expanded UUSA operation. The model inputs are as summarized in Table 4.6-5a and 4.6-5b. Table 4.6-5c summarizes the predicted UUSA U and HF ambient impacts in comparison to the applicable OEL/100 listed for toxic air pollutants listed in 20.2.72.502 NMAC. The modeling results demonstrate that U and HF impacts are well below the applicable OEL/100 levels.

The proposed UUSA facility capacity expansion is subject to 20.2.73 NMAC, Notice of Intent and Emission Inventory Requirements; because the existing facility has potential emissions greater than 10 tons per year of any regulated air contaminant. Therefore, an updated Notice of Intent will be submitted for the proposed expanded facility. However, the existing and proposed expanded operation will not be subject to 20.2.72 NMAC, Air Quality Construction Permits. The existing diesel generators and proposed additional units are exempt as standby generators. The cooling towers and diesel storage tanks are exempt as emission units with potential emissions less than one-half ton per year. In addition, the sources of state-regulated toxic air pollutants (hydrogen fluoride and uranium) are not subject to construction permit requirements in 20.2.72.402 NMAC because the potential emissions of each toxic air pollutant are less than their respective emission levels listed in 20.2.72.502 NMAC (potential uncontrolled emissions of fluorides are less than 0.167 pounds per year and potential emissions of uranium are less than 0.0133 pounds per year).

Although not required in this case, a dispersion modeling analysis was performed to evaluate the ambient impacts of hydrogen fluoride and uranium in comparison to one-hundredth of the respective Occupational Exposure Levels (OEL) listed in 20.2.72.502 NMAC. The maximum 8-hour average hydrogen fluoride impact predicted by the model was 2,500 times lower than the OEL/100 and the maximum predicted 8-hour average uranium impact was 20,000 lower than the OEL/100.

4.6.3 Visibility Impacts from Construction

Visibility impacts from construction will be limited to fugitive dust emissions. Fugitive dust will originate predominantly from vehicle traffic on unpaved surfaces, earth moving, excavating and bulldozing, and to a lesser extent from wind erosion. The only potential visibility impacts from operation of the UUSA is from the cooling towers. The cooling towers that UUSA uses at the site combine adiabatic and evaporative heat transfer processes to significantly reduce visible plumes. Cooling to support the proposed facility capacity expansion will be provided by closed loop chiller units. No further construction of cooling towers is anticipated for the proposed facility capacity expansion. Therefore, UUSA has concluded that any visibility impacts from cooling tower plumes will be minimal. Visibility impacts from decommissioning will be limited to fugitive dust. Fugitive dust will originate predominately from building demolition bulldozing, and vehicle traffic on unpaved surfaces.

4.6.4 Air Quality Impacts from Decommissioning

Air quality impacts will occur during decommissioning work, such as fugitive dust, vehicle exhaust, portable generator exhaust, air compressor exhaust, cutting torch fumes, and solvent fumes. Decommissioning emission types, source locations, and emission quantities are presented in Table 4.6-7, Decommissioning Emission Types. Fugitive dust and vehicle exhaust during decommissioning are assumed to be bounded by the emissions during construction.

4.6.5 Mitigative Measures for Air Quality Impacts

Air concentrations of the Criteria Pollutants for vehicle emissions and fugitive dust will be below the NAAQS and thus will not require mitigative measures. Visibility impacts from fugitive dust emissions will be minimized by watering of the site, during the construction phase to suppress dust emissions. Water conservation will be considered when deciding how often dust suppression sprays will be applied.

Mitigative measures for all credible accident scenarios considered in the Safety Analysis Report (SAR) are summarized in ER Section 4.12, Public and Occupational Health Impacts and ER Chapter 5, Mitigation Measures.

Mitigation measures will be in place to minimize potential impact on air quality. These include the following items:

- The CRDB GEVS, Local Extract GEVS, and Pumped Extract GEVS at the existing installation are designed to collect and clean all potentially hazardous gases from the plant prior to release into the atmosphere. Instrumentation is provided to detect and signal via alarm, all non-routine process conditions, including the presence of radionuclides or HF in the exhaust stream that will trip the systems to a safe condition, in the event of effluent detection beyond routine operational limits.
- The Centrifuge Test and Post Mortem Facilities Exhaust Filtration System is designed to collect and clean all potentially hazardous gases from the serviced areas in the CAB prior to release into the atmosphere. Instrumentation is provided to detect and signal the Control Room via alarm, all non-routine process conditions, including the presence of radionuclides or HF in the exhaust stream. Operators will then take appropriate actions to mitigate the release.
- Construction BMPs will be applied as described previously to minimize fugitive dusts.
- Air concentrations of the criteria pollutants for vehicle emissions and fugitive dust will be below the National Ambient Air Quality Standards (NAAQS) and thus will not require further mitigation measures.

The only potential air quality cumulative effect is increases in the Total Suspended Particulate (TSP) from combined emissions from the Waste Control Specialists (WCS) and ongoing construction activities at UUSA. This potential cumulative effect (impact) will be transitory and limited to the construction period.

4.6.6 Cumulative Impacts to Air Quality

Both Lea County, New Mexico, and Andrews County, Texas, are in attainment for all of the criteria pollutants (EPA, 2012a), despite the presence of oil and gas development and other industries in the area. Other considered projects such as the WIPP and IIFP facility are located a distance from the UUSA facility, and are not anticipated to impact local air quality.

WCS's annual emissions are generally less than those expected from the UUSA operation including the impact of the proposed facility capacity expansion (except for volatile organic compounds) and significantly less than 1 percent of the total point source contribution for all criteria pollutants. The construction of the disposal cells would add some fugitive dust emissions and the emissions of criteria pollutants but would be controlled to well below the NAAQS values (WCS, 2004) as they are for the current and proposed UUSA operation. Therefore, the cumulative impacts of the WCS and UUSA to the surrounding area would also be small. In addition, there will be ongoing low level and fugitive emissions of hydrocarbons associated with the local operation of oil and gas development and recovery operations. The nature of the emissions from oil and gas will be different from that of the UUSA facility (hydrocarbons only versus products of combustion, and process specific compounds such as uranium and hydrogen fluoride) and therefore not considered a cumulative impact with the emissions from the oil and gas local industry. No other foreseeable point-source activity can be identified that would cumulatively impact the air quality in the vicinity of the UUSA facility.

4.6.7 Comparative Air Quality Impacts of No Action Scenarios

Supplemental ER Chapter 2, Alternatives, provides a discussion of possible alternatives to the capacity expansion construction and operation of UUSA, including an alternative of "no action," i.e., not expanding the current capacity. The following information provides comparative conclusions specific to the concerns addressed in this subsection for each of the three "no action" scenarios addressed in ER Section 2.3 and Table 2.3-2, Comparison of Environmental Impacts for the Proposed Action and the No-Action Scenarios.

No-Action Scenario B – No UUSA capacity expansion and no additional enrichment capacity is constructed by others. Except for minimal air quality impacts associated with pre-construction and construction-at-risk activities, there will be no additional meteorological or air quality impacts at the UUSA site. Reliance on coal-fired power plants for Paducah's energy needs would continue.

No-Action Scenario C – No UUSA capacity expansion, facility operates at 3.0 MSWU. Additional enrichment capacity is supplied by a combination of the construction and operation of Eagle Rock in Idaho Falls, ID (proposed capacity 3 MSWU) and GLE in Wilmington, NC (proposed capacity 6 MSWU). The meteorological or air quality impacts would be increased due to construction and operation on two additional sites. The meteorological or air quality impacts for these two additional projects are evaluated in the individual environmental impact statements for the projects.

No-Action Scenario D – No UUSA capacity expansion, facility operates at 3.0 MSWU. Additional enrichment capacity is supplied by a combination of the construction and operation of Eagle Rock in Idaho Falls, ID (proposed capacity 3 MSWU), GLE in Wilmington, NC (proposed capacity 6 MSWU), and ACP in Piketon, OH (planned capacity 3.7 MSWU). The meteorological or air quality impacts would be increased due to construction and operations on three additional sites. The meteorological or air quality impacts for these three additional projects are evaluated in the individual environmental impact statements for those projects.

4.6.8 Section 4.6 Tables (10 MSWU Facility)

Table 4.6-1 Peak Emission Rates (10 MSWU facility)

Pollutant	Total Work-Day Average Emissions g/s (lbs/hr)
VEHICLE EMISSIONS:	
Hydrocarbons	0.58 (4.6)
Carbon Monoxide	3.70 (29.4)
Nitrogen Oxides	7.53 (59.8)
Sulfur Oxides	0.76 (6.0)
Particulates	0.54 (4.3)
FUGITIVE EMISSIONS:	
Particulates	2.4 (19.1)

Table 4.6-2 Predicted Property-Boundary Air Concentrations And Applicable NAAQS

	Maximum 1-Hr Average (µg/m³)		Maximum 3-Hr Average (µg/m³)		Maximum 8-Hr Average (µg/m³)		Maximum 24-Hr Average (µg/m³)		2nd Highest 24-Hr Average (µg/m³)		Maximum Annual Average (µg/m³)	
Pollutant	**Predicted**	**NAAQS**	**Predicted**	**NAAQS**	**Predicted**	**NAAQS**	**Predicted**	**NAAQS**	**Predicted**	**NAAQS**	**Predicted**	**NAAQS**
VEHICLE EMISSIONS												
Hydrocarbons	635.3	NA	238.9	NA	84.5	NA	36.9	NA	18.8	NA	2.9	NA
Carbon Monoxide	4,036.5	40,000	1,518.1	NA	537.0	10,000	234.4	NA	119.6	NA	18.5	NA
Nitrogen Oxides	8,204.2	NA	3,085.5	NA	1,091.5	NA	476.5	NA	243.1	NA	37.6	100
Sulfur Oxides	822.9	NA	309.5	1,310(a)	109.5	NA	47.8	365	24.4	NA	3.8	80
Particulates	591.8	NA	222.6	NA	78.7	NA	34.4	NA	17.5	150	2.7	50
FUGITIVE DUST												
Particulates	2,615.8		983.8		348.0		151.9		77.5	150	12.0	50

(a) Secondary standard

Table 4.6-3 Construction Emission Types

Emission Type	Source Location	Quantity
Fugitive Dust	Onsite	2.4 g/s (19.1 lb./hr)
Vehicle Exhaust	Onsite	4,535 kg/yr (5 tons/yr)
Portable Generator Exhaust	NA[1]	NA[1]
Paint Fumes	Onsite buildings	NA[1]
Welding Torch Fumes	Onsite buildings	NA[1]
Solvent Fumes	NA[1]	NA[1]
Air Compressors	NA[1]	NA[1]

[1]Information is not available at this time.

Table 4.6-4 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 4.6-5 Air Emissions During Operations

Table 4.6-5a – Summary of Stack Parameters for Model Input

Type	ID	Desc	Base_Elev	Height	Diam	Exit_Vel	Exit_Temp	Release_Type	Emission_Rate	Coord (East UT	oord (North U
			[m]	[m]	[m]	[m/s]	[K]		[g/sec]	[m]	[m]
POINT	STCK1	Fume Hood GEVS	1039.31	16.46	0.9144	16.8888	Ambient	VERTICAL	2.97355E-07	680,494.1	3,590,281.2
POINT	STCK34_1	Local Exhausts	1039.31	16.46	0.3048	9.37867	Ambient	VERTICAL	1.83957E-08	680,494.1	3,590,281.2
POINT	STCK34_2	Local Exhausts	1039.31	16.46	0.3048	9.37867	Ambient	VERTICAL	1.83957E-08	680,609.3	3,590,280.3
POINT	STCK34_3	Local Exhausts	1039.31	16.46	0.3048	9.37867	Ambient	VERTICAL	1.83957E-08	680,426.1	3,590,278.6
POINT	STCK34_4	Local Exhausts	1039.31	16.46	0.3048	9.37867	Ambient	VERTICAL	1.83957E-08	680,352.4	3,590,277.7
POINT	STCK34_5	Local Exhausts	1039.31	16.46	0.3048	9.37867	Ambient	VERTICAL	1.83957E-08	680,682.5	3,590,276.8

Table 4.6-5b – Dimensional Data for GEP Stack Height and Downwash Analysis

Major Buildings and Structures Dimensions		
Building/Structure	**Height in feet**	**Footprint Size**
Existing Separations Building	41	234' x 565'
Capacity Expansion Area 1	41	234' x 565'
Capacity Expansion Area 2	41	234' x 565'
Capacity Expansion Area 3	41	234' x 565'
Capacity Expansion Area 4	41	234' x 565'

Table 4.6-5c Summary of U and HF Modeling Results (8-hour average impacts)

Toxic Air Pollutant	Max. NEF Impact (µg/m^3)	OEL/100 (µg/m^3)	Output File
Uranium	9.9E-5	2	NEF1.ado
Hydrogen Fluoride	9.3E-3	25	NEF3.ado

Table 4.6-6 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 (Gasoline)	4.6	210	64.4 (40)	38,640
Heavy Duty Truck (Diesel)	10.2	18	805 (500)	91,800
Total				130,400
Daily Emissions				**1.3E-01 metric tons (1.4E-01 tons)**
NITROGEN OXIDES				
Light Duty Vehicles (Gasoline)	0.7	210	64.4 (40)	5,880
Heavy Duty Truck (Diesel)	8.0	18	805 (500)	72,000
Total				77,880
Daily Emissions				**7.8E-02 metric tons (8.6E-02 tons)**

Table 4.6-7 Decommissioning Emission Types

Emission Type[1]	Source Location	Quantity
Fugitive Dust	Onsite	2.4 g/s (19.1 lb./hr)
Vehicle Exhaust	Onsite	4,535 kg/yr (5 tons/yr)
Portable Generator Exhaust	NA[2]	NA[2]
Cutting Torch Fumes	Onsite buildings	NA[2]
Solvent Fumes	NA[2]	NA[2]
Air Compressors	NA[2]	NA[2]

1 Fugitive dust and vehicle exhaust during decommissioning are assumed to be bounded by the emissions during construction.

2 Information is not available at this time.

4.7 Noise Impacts

Supplemental ER Section 3.7 describes the noise impacts from the initial construction and current operation. This section describes any additional impacts to noise from the expansion.

4.7.1 Predicted Noise Levels - Construction Impacts

The facility capacity expansion at UUSA will require the continued use of construction equipment for excavation, such as backhoes, front loaders, bulldozers, and dump trucks; materials-handling equipment, such as cement mixers and cranes; and compressors, generators, and pumps. These are the same types of equipment that were in use for initial construction of the facility. Noise generated from this type of equipment ranges from 87 to 99 dBA at approximately 9.1 m (30 ft) (Cowan, 1994), which would be equivalent of 57 to 69 dBA at approximately 305 m (1,000 ft). It was assumed as part of the noise impact evaluation that most of the construction activities would occur during weekday, daylight hours; however, construction could occur during nights and weekends, if necessary. Large trucks would produce noise levels around 89 dBA at approximately 9.1 m (30 ft) (Cowan, 1994), which is equivalent of 77 dBA approximately 37m (120 ft).

The highest noise levels during ongoing construction activities were predicted to be less than 84 to 96 dBA, which was the level estimated at the south fence line during construction of the Site Stormwater Detention Basin. This feature is now existing at the site and no further construction at the Stormwater Detention Basin is required to support the facility capacity expansion. The south fence line is about 38.1 meters (125 feet) from New Mexico Highway 176 and the east fence line is adjacent to vacant land. Construction associated with the capacity expansion will occur farther from the property boundary and will have less of an impact at the property boundaries.

Noise sources will also include the movement of workers and construction equipment, and the use of earth-moving heavy vehicles, compressors, loaders, concrete mixers and cranes. There is already substantial truck traffic using New Mexico Highway 176 and New Mexico Highway 18.

Due to the temporary and episodic nature of construction, and because of the significant distance to the nearest residence 4.3 km (2.63 mi), actual construction noise at the site due to the capacity expansion did not have a significant effect on nearby residents. Vehicle traffic will be the most noticeable cause of construction noise. Receptors located closest to the intersection of New Mexico Highway 18 and New Mexico Highway 176 will be the most aware of the increase in traffic due to proximity to the source.

4.7.2 Operational Impacts

The facility capacity expansion at UUSA would generally continue a similar level of noise as exists from the current operation. Vehicular traffic will be slightly increased on New Mexico Highway 176 and New Mexico Highway 18 during operation, but due to the considerable truck traffic already present, noise levels should not increase significantly.

4.7.3 Mitigation

Mitigation of operational noise sources occurs primarily from the plant design, as cooling systems, valves, transformers, pumps, generators, and other facility equipment, will generally be located inside plant structures. The buildings themselves will absorb the majority of the noise generated within. Natural land contours, vegetation (such as scrub brush and trees), and site buildings and structures will mitigate noise from other equipment located outside of site structures. Distance from the noise source is also a key factor in the control of noise levels to area receptors. It is generally true that the sound pressure level from an outdoor noise source decreases 6 dB per doubling of distance (Cowan, 1994). Thus, a noise that measures 80 dB at 15.2 m (50 ft) away from the source will measure 74 dB at 30.5 m (100 ft), 68 dB at 61 m (200 ft), and 62 dB at 122 m (400 ft). Noise from construction activities will have the highest sound levels, occasionally peaking at 99 dBA at 9.1 m (30 ft) from the source, which would be equivalent to 69 dBA at 305 m (1,000 ft) (Cowan, 1994). As noted above, the nearest home is located west of the site at a distance of approximately 4.3 km (2.63 miles). However, heavy truck and earth moving equipment usage will be restricted after twilight and during early morning hours. All noise suppression systems on construction vehicles shall be kept in proper operation.

4.7.4 Cumulative Impacts

Cumulative impacts from all site noise sources should typically remain at or below HUD guidelines of 65 dBA Ldn and the EPA guidelines of 55 dBA Ldn (EPA 550/9) during the UUSA facility capacity expansion and continued operation. Residences closest to the site boundary will experience only minor impacts from construction noise, with the majority of the noise sources being from additional construction vehicle traffic. Since phases of construction include a variety of activities, there may be short-term occasions when higher noise levels will be present; examples include the use of backhoes and large generators.

The level of noise anticipated offsite is comparable to noise levels near a busy road and less than noise levels found in most city neighborhoods. Expected noise levels will mostly affect a 1.6-km (1-mi) radius. The noise of all site activities should have a minor impact and only those receptors closest to the site boundary. It is anticipated a level similar to UUSA construction noise will be associated with the planned construction at WCS. WCS will be under similar noise control guidelines. The cumulative noise from UUSA and WCS construction is anticipated to be small on the potential receptors. Other adjacent facilities such as the landfill and Wallach Concrete will also generate some potential noise which in cumulation with UUSA and WCS will be minimal and in nature with the local industrial setting.

4.7.5 Comparative Noise Impacts of No Action Scenarios

Supplemental ER Chapter 2, Alternatives, provides a discussion of possible alternatives to the capacity expansion construction and operation of UUSA, including an alternative of "no action," i.e., not expanding the current capacity. The following information provides comparative conclusions specific to the concerns addressed in this subsection for each of the three "no action" scenarios addressed in ER Section 2.3 and Table 2.3-2, Comparison of Environmental Impacts for the Proposed Action and the No-Action Scenarios.

While small, all of these No-Action Scenarios will have limited noise impacts at the UUSA site because the pre-construction activities described in Section 1.3.5 and the construction at risk activities described in Section 1.3.6 would still take place, and these will generate some amount of noise.

No-Action Scenario B – No UUSA capacity expansion and no additional enrichment capacity is constructed by others. No noise impacts at the UUSA site or at other potential sites.

No-Action Scenario C – No UUSA capacity expansion, facility operates at 3.0 MSWU. Additional enrichment capacity is supplied by a combination of the construction and operation of

Eagle Rock in Idaho Falls, ID (proposed capacity 3 MSWU) and GLE in Wilmington, NC (proposed capacity 6 MSWU). The noise impact may be increased due to construction and operation at two additional sites. The noise impacts for these two additional projects are evaluated in the individual environmental impact statements for the projects.

No-Action Scenario D – No UUSA capacity expansion, facility operates at 3.0 MSWU. Additional enrichment capacity is supplied by a combination of the construction and operation of Eagle Rock in Idaho Falls, ID (proposed capacity 3 MSWU), GLE in Wilmington, NC (proposed capacity 6 MSWU), and ACP in Piketon, OH (planned capacity 3.7 MSWU). The noise impact may be increased due to construction and operation at three additional sites. The noise impacts for these three additional projects are evaluated in the individual environmental impact statements for the projects.

4.8 Historic and Cultural Resource Impacts

LES ER Section 4.8 describes the impacts of construction and operation of the initial facility on the site's historical and cultural resources. Since the initial survey and treatment plan execution, no additional historic and cultural resources have been identified onsite.

Because the proposed expansion will take place within the existing disturbed area of the UUSA site, there will be no new or additional impacts to historical or cultural resources. LES ER Section 4.8 is therefore incorporated by reference; only events subsequent to that initial assessment are discussed below.

4.8.1 Cultural Resources Treatment Plan

Based on the terms and conditions of a memorandum of agreement (NRC, 2005), a cultural resource treatment plan was developed and implemented prior to initial construction on the UUSA site. This agreement continues to govern construction and operations at the site.

4.8.2 Agency Consultation

All appropriate state agencies and affected Native American Tribes were consulted prior to the initial construction on the site. Copies of correspondence included in LES ER Appendix A. Since the initial survey and treatment plan execution, no additional historic and cultural resources have been identified onsite.

Because the proposed facility capacity expansion will occur within the previously surveyed and mitigated property, discussions in 2012 with the NM SHPO confirmed mitigation of previously identified sites and that no further action would be required in light of proposed ongoing construction for the facility capacity expansion.

4.8.3 Cumulative Impacts

Given the small number of archaeological sites identified and mitigated on the site, there will be no cumulatively significant impacts to cultural resources.

There are no regional National Registry listed locations in the vicinity of the UUSA or adjacent operations. There would be no cumulative adverse impacts to cultural or historical resources in the area because these resources would be specific to the particular sites, and previously identified resources at the UUSA site have been mitigated in accordance with a treatment plan.

4.8.4 Comparative Historical and Cultural Resource Impacts of No Action Scenarios

ER Chapter 2, Alternatives, provides a discussion of possible alternatives to the capacity expansion construction and operation of UUSA, including an alternative of "no action," i.e., not expanding the current capacity. The following information provides comparative conclusions specific to the concerns addressed in this subsection for each of the three "no action" scenarios addressed in ER Section 2.3 and Table 2.3-2, Comparison of Environmental Impacts for the Proposed Action and the No-Action Scenarios.

No-Action Scenario B – No UUSA capacity expansion and no additional enrichment capacity is constructed by others. No additional historic and cultural resource impacts at the UUSA site or at other potential sites.

No-Action Scenario C – No UUSA capacity expansion, facility operates at 3.0 MSWU. Additional enrichment capacity is supplied by a combination of the construction and operation of Eagle Rock in Idaho Falls, ID (proposed capacity 3 MSWU) and GLE in Wilmington, NC (proposed capacity 6 MSWU). The historic and cultural resource impact would potentially be increased due to construction and clearing on two additional sites. The historic and cultural resource impacts for these two additional projects are evaluated in the individual environmental impact statements for the projects.

No-Action Scenario D – No UUSA capacity expansion, facility operates at 3.0 MSWU. Additional enrichment capacity is supplied by a combination of the construction and operation of Eagle Rock in Idaho Falls, ID (proposed capacity 3 MSWU), GLE in Wilmington, NC (proposed capacity 6 MSWU), and ACP in Piketon, OH (planned capacity 3.7 MSWU). The historic and cultural resource impact would potentially be increased due to construction and clearing on three additional sites. The historic and cultural resource impacts for these three additional projects are evaluated in the individual environmental impact statements for the projects.

4.9 Visual/Scenic Resources Impacts

This Section describes the additional impact the proposed expansion will have on visual and scenic resources.

4.9.1 Photos

As shown on the site perimeter photographs (see ER Section 3.9 Figures, Site Photographs), the existing structures on the UUSA facility are minimally visible from the surrounding roadways. Continued construction and operation for the facility capacity expansion will be within the same property boundaries and general footprint of the structures appearing in the 2012 perimeter view photographs. The visual impact from the surrounding roadways is not anticipated to change substantially due to the continuing construction and operation of the UUSA facility for the facility capacity expansion.

4.9.2 Significant Visual Impacts

Proposed site development potentially impacting the visual/scenic quality of the UUSA facility includes:

- Several additional buildings surrounded by chain link fencing;
- Additional power lines; and
- Expanded transformer yard.

4.9.3 Physical Facilities Out Of Character with Existing Features

Given that the site is developed, the capacity expansion at the current site is in character with current, onsite conditions. Furthermore, considering the neighboring properties have been developed for industrial purposes (WCS facility, county landfill and quarry), the proposed additional structures are similar to existing, architectural features on surrounding land. Overall, the visual impact of the capacity expansion at UUSA will be minimal.

4.9.4 Structures Obstructing Existing Views

None of the proposed onsite structures will be taller than 40 m (130 ft), which is consistent with the current facility structures/buildings. Due to the relative flatness of the site and vicinity, the structures will be observable from New Mexico Highway 176 and from nearby properties, partially obstructing views of existing landscape. However, considering that there are no high quality viewing areas (see LES ER Section 3.9.7, High Quality View Areas) and the many existing, manmade structures (pump jacks, high power lines, industrial buildings, above-ground tanks) near the UUSA site, the obstruction of existing views due to proposed structures will be comparable to current conditions. Refer to ER Figures 3.9-1A through 3.9-1E.

4.9.5 Structures Creating Visual Intrusions

The additional structures will be set back a substantial distance from New Mexico Highway 176 and within the currently disturbed footprint of the operating facility. Due to the relative flatness of the area, taller proposed plant structures (such as the additional SBM buildings) will be visible from the highway and adjacent properties, however, they will be of similar construction to the existing SBM structures and will not significantly alter the skyline. Furthermore, considering the existing structures associated with neighboring industrial properties to the north, east and south (quarry, WCS facility and county landfill, respectively) the nearby utility poles along New Mexico Highway 176, the high power utility line to the east that runs parallel to the New Mexico/Texas state line, and the numerous pump jacks dotting the landscape to the north, south and west, the proposed additional onsite structures will be no more intrusive.

4.9.6 Structures Requiring the Removal of Barriers, Screens or Buffers

As noted in LES ER Section 3.9.1, Viewshed Boundaries, a series of small sand dunes on the western portion of the site provide natural screening from areas to the west. None of the proposed additional onsite structures will require removal of natural barriers, screens or buffers. Any removal of natural barriers, screens or buffers associated with road construction will be minimized. Additionally natural landscape, using vegetation indigenous to the area, is planned to provide additional aesthetically pleasing screening measures.

4.9.7 Structures that Create Visual, Audible or Atmospheric Elements Out of Character with the Site

The proposed additional onsite structures will be in character with the existing site buildings and structures. They are also comparable to those existing on the surrounding industrial properties. None of the UUSA structures or associated activities will typically produce significant noise levels audible from offsite (see ER Section 4.7.1, Predicted Noise Levels) or create significant atmospheric elements (such as a large emission plumes) visible from offsite.

4.9.8 Visual Compatibility and Compliance

As noted in LES ER Section 3.9.9, Regulatory Information, discussions were held prior to the initial construction between UUSA and the City of Eunice, New Mexico, and Lea County officials, to coordinate and discuss local area community planning issues. No local or county zoning, land use planning or associated review process requirements were identified. All applicable local ordinances and regulations will be followed during the continuing construction and operation of UUSA. Additional development of the site will continue to meet federal and state requirements for nuclear and radioactive material sites regarding design, siting, construction materials, and monitoring.

4.9.9 Potential Mitigation Measures

Mitigation measures will be in place to minimize the impact to visual and scenic resources. These include the following items:

- The use of accepted natural, low-water consumption landscaping techniques to limit any potential visual impacts. These techniques will incorporate, but not be limited to, the use of landscape plantings. As for aesthetically pleasing screening measures, planned landscape plantings will include indigenous vegetation.
- Prompt re-vegetation or covering of bare areas will be used to mitigate visual impacts due to construction activities.

4.9.10 Cumulative Impacts to Visual/Scenic Quality

The area immediately surrounding the UUSA facility is industrial, developed for oil and gas resources, or undeveloped in nature. The proposed UUSA facility capacity expansion will result in additional buildings of a similar nature on the UUSA property. The increased development of the WCS facility for waste disposal is of a similar nature to the existing site development and is consistent with the visual impacts in the vicinity. No cumulative impacts are anticipated to the visual and scenic resources. The cumulative impacts to the visual/scenic quality of the UUSA facility can be assessed by examining proposed actions associated with ongoing construction of the UUSA facility and development of surrounding properties.

4.9.11 Comparative Visual/Scenic Resources Impacts of No Action Scenarios

ER Chapter 2, Alternatives, provides a discussion of possible alternatives to the construction and operation of the NEF, including an alternative of "no action," i.e., not building the NEF. The following information provides comparative conclusions specific to the concerns addressed in this subsection for the three "no action" scenarios addressed in ER Section 2.3 and Table 2.3-2, Comparison of Environmental Impacts for the Proposed Action and the No-Action Scenarios.

No-Action Scenario B – No UUSA capacity expansion and no additional enrichment capacity is constructed by others. No additional visual scenic resource impacts at the UUSA site or at other potential sites.

No-Action Scenario C – No UUSA capacity expansion, facility operates at 3.0 MSWU. Additional enrichment capacity is supplied by a combination of the construction and operation of Eagle Rock in Idaho Falls, ID (proposed capacity 3 MSWU) and GLE in Wilmington, NC (proposed capacity 6 MSWU). The visual and scenic resources impacts would be increased due to construction and clearing on two additional sites. The visual scenic resource impacts for these two additional projects are evaluated in the individual environmental impact statements for the projects.

No-Action Scenario D – No UUSA capacity expansion, facility operates at 3.0 MSWU. Additional enrichment capacity is supplied by a combination of the construction and operation of Eagle Rock in Idaho Falls, ID (proposed capacity 3 MSWU), GLE in Wilmington, NC (proposed capacity 6 MSWU), and ACP in Piketon, OH (planned capacity 3.7 MSWU). The visual scenic resource impact would be increased due to construction and clearing on three additional sites. The visual scenic resource impacts for these three additional projects are evaluated in the individual environmental impact statements for the projects.

4.9.12 Section 4.9 Figures

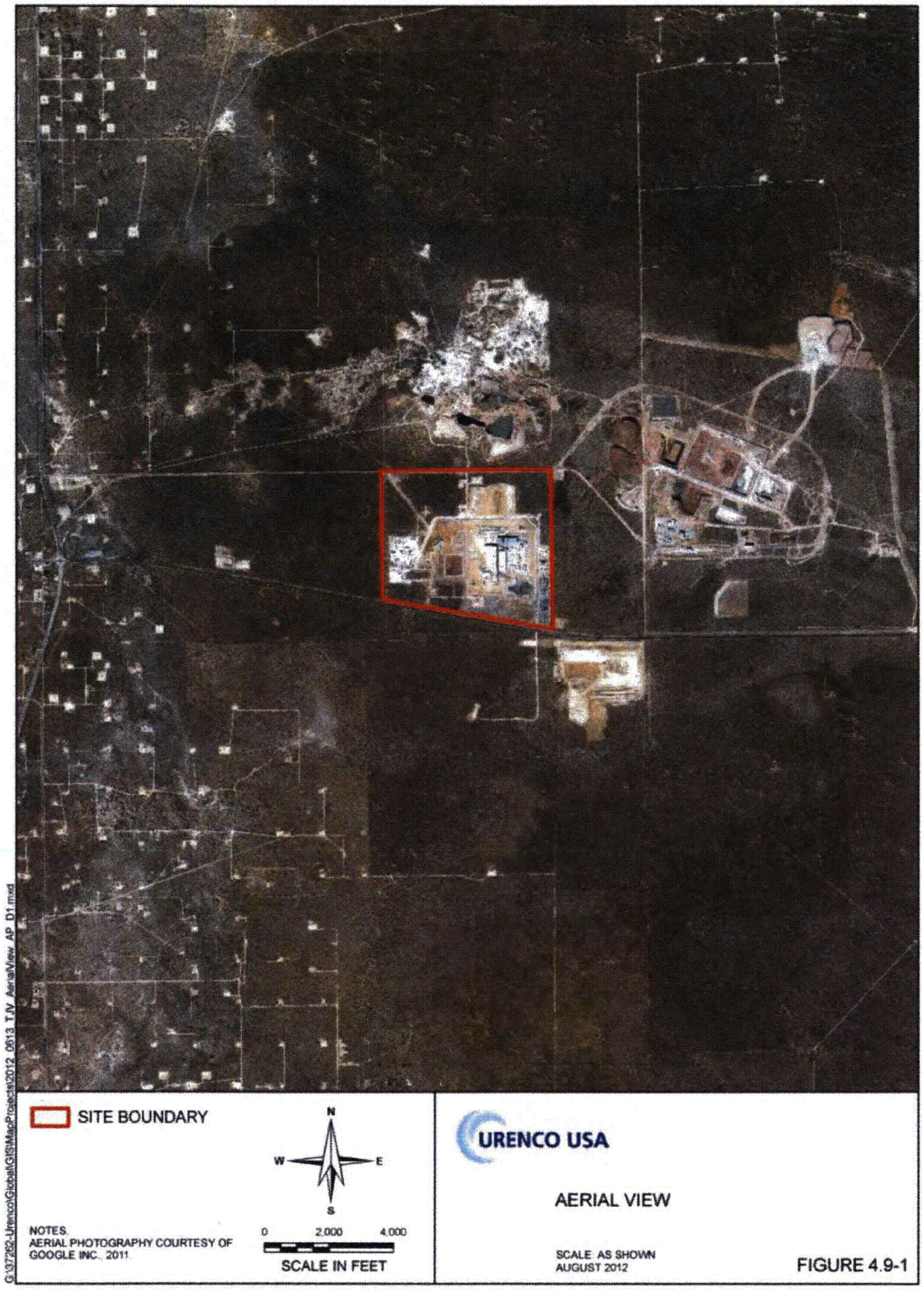

Figure 4.9-1 Aerial View

4.10 Socioeconomic Impacts

This section describes the socioeconomic impacts to the community surrounding the UUSA site, including the impacts from construction and operation associated with the UUSA facility capacity expansion.

In the 2005 EIS, the NRC concluded the overall benefits of the facility outweighed the environmental disadvantages and costs. The NRC concluded: "The beneficial economic impacts of the proposed NEF on the local communities have been determined to be MODERATE" (NRC, 2005).

4.10.1 Facility Contractor Population

Groundbreaking at the UUSA site commenced in 2006, with the initial construction of the site anticipated to be completed in 2013. Activities associated with the construction phase of the facility capacity expansion would be similar to the activities of the initial and ongoing construction at the UUSA site. Construction activities for the proposed facility capacity expansion would continue within the current boundaries of the site property.

Approximately 800 to 1,000 workers are or will be employed for construction of the UUSA facility. See LES ER Table 4.10-1, Estimated Number of Contractors by Annual Pay. The proposed facility capacity expansion would mean that the size of the contracting crew would remain fairly constant at 800 to 1,200 skilled labor providers through 2020.

During the early construction stages of each phase of proposed facility capacity expansion, the workforce is expected to consist primarily of structural crafts. As each construction phase progresses, there would be a transition to predominantly mechanical and electrical crafts in the later stages. The initial ER anticipated the bulk of the contracting workforce would come from the surrounding 120-kilometer (km) (75-mile) region due to the relatively low population of the area. American Community Survey (ACS) Civilian Employment Data for the period 2006-2010 shows an increase in the labor force of the Lea-Andrews County region (Table 3 Civilian Employment Data, 2006-2010). The available regional labor pool is expected to continue to correlate with the required education and skill levels for the contracting work force.

4.10.2 Impacts on Human Activities

Initial development of the UUSA site was anticipated to increase demands on local housing, public services and schools. The initial ER estimated 120 housing units would be needed to accommodate the new contracting workforce. The percentage of vacant housing units in the Lea-Andrews County area was about 16% and 15%, respectively, meaning that more than 4,000 housing units were available. The current estimate of vacant housing units in the Lea-Andrews County area is approximately 10.8%, meaning approximately 3,000 housing units are available (Table 3.10-5, Housing Information in the Lea County, New Mexico-Andrews County, Texas Vicinity). Accordingly, there should be no measurable impact related to the need for additional housing associated with the proposed facility capacity expansion.

The impact on schools, including the effects on student-teacher ratios, would be manageable during the period of construction of the UUSA site. The initial evaluation of site impacts estimated a local student-teacher ratio of 17:1. Review of 2010 Census data shows a decrease in the student-teacher ratio, now averaging less than 14:1 in the regional public schools (Table 3.10-6 Educational Facilities near the UUSA). Table 3.10-7 shows the Educational Information in the Lea County, New Mexico/Andrews County, Texas Vicinity. It is anticipated that the UUSA construction and operation would not result in unmanageable demand on the local school system.

4.10.3 Facility Operation - Jobs, Income, and Population

Potential impacts to local economy, housing, schools and public services from the proposed facility capacity expansion are not expected to be different from the small impacts previously evaluated prior to construction of the UUSA facility.

The UUSA operation would create a minimal demand for increase in permanent workforce to support the expanded operations. The permanent increase in employment, income and population in the area associated with the start-up and current operation of the UUSA facility would be at least sustained with the proposed facility capacity expansion. The average number of workers employed for operation of the UUSA is assumed to continue to be approximately 250 (2012), rising slightly to 258 to accommodate additional UUSA employees through the facility capacity expansion to 10 MSWU.

The increase in UUSA employees would be distributed to administrative, maintenance/facility and operational employees. It is anticipated this additional work force would be drawn from, or would settle in the surrounding communities as permanent residents, and wages would be similar to those previously evaluated prior to the site construction.

The UUSA annual operating payroll (including benefits) will be approximately $52.4 million for a workforce of 258 projected at the completion of the proposed facility expansion to 10 MSWU in 2020. The average salary is approximately three times the individual per capita income in the Lea New Mexico-Andrews, Texas County area and approximately 60% and 40% above the median household income for those counties, respectively (Table 3.10-4, Area Income Data).

Unemployment rates and the percentage of individuals and households living below poverty level in Lea County and the state of New Mexico have decreased since the initial socioeconomic evaluation. Andrews County and the state of Texas have shown a slight increase in the number of individuals living below the poverty level. The rate of households below the poverty level decreased in Andrews County and increased slightly in Texas. Individual per capita income and household median income have increased in both counties (Table 3.10-4, Area Income Data, 2006-2010 ACS). Continued operation of the UUSA facility would continue to have a small, but positive impact on area income and employment.

The overall change in population density and population characteristics in Lea County, New Mexico and Andrews County, Texas due to operation of the UUSA facility will be insignificant.

4.10.4 Community Characteristic Impacts

The continued construction and operation of the UUSA facility would result in minimal demand for increase in permanent workforce. The creation of permanent jobs would lead to some additional demands for housing and public services. However, this increase in demands would be small in the region of influence.

The increase in area population due to UUSA operation would be insignificant. Based on the current vacancy rate in the area (Table 3.10-7, Housing Information in the Lea County, New Mexico-Andrews County, Texas Vicinity), the relatively small need for housing units is not anticipated to burden or raise prices in the local real estate market.

Similarly, a smaller increase in local elementary and secondary school enrollment will be expected. The student-teacher ratio averages less than 14:1 in the regional public schools (Table 3.10-6, Educational Facilities near the UUSA). It is anticipated that operation of the UUSA facility would not result in unmanageable demand on the local school system.

Area medical, fire, and law enforcement services should be minimally affected as well. Agreements exist among the cities in Lea County, New Mexico, for emergency services if personnel in Eunice, New Mexico are not available. Otherwise, available services should be able to absorb the needs of new workers and residents. To allow provision of services, the development of new fire departments or police departments, for example, should not be necessary because the UUSA is be equipped with its own Fire Protection System and Security Force.

4.10.5 Regional Impact Due to Construction and Operation

The impact estimates in this ER are based on the combined population of Lea County, New Mexico and Andrews County, Texas. 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 this ER 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.

As shown in Table 3.10-1, the population of Lea County, New Mexico was approximately 64,727 in 2010. 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 2010 were approximately 2,922, 34,122, and 2,047, respectively, providing a combined total population of approximately 39,091. The population increase to this region is anticipated to be negligible given that the UUSA facility has been under construction and operating for several years, and the workforce for construction and operation of the proposed facility capacity expansion would be similar to that previously employed in the region.

As shown in Table 3.10-l, the population of Andrews County, Texas, was approximately 17,786 in 2010. The two closest population centers in Texas to the site are Andrews and Seminole at 51 km (32 mi) each. The populations of these two areas in 2010 were 11,088 and 6,430, respectively. It is reasonable to assume that the population increase associated with continued UUSA construction and operation would mostly relocate nearby population centers of 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 56,609. The population increase to this region is anticipated to be negligible given that the UUSA facility has been under construction and operating for several years, and the workforce for continued construction and operation of the facility would be similar to that previously employed in the region. 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 UUSA facility.

The estimated tax revenue and estimated allocations to the State of New Mexico and Lea County resulting from the construction and operation of the UUSA facility are provided in Tables 4.10-2, Estimated Tax Revenue and 4.10-3, Estimated Tax Revenue Allocations. Total tax revenue is estimated to range from $821 million up to $973 million. The total tax revenue paid thru 2012 was $93.9 million and is reflected in Table 4.10-2, Estimated Tax Revenue.

4.10.6 Cumulative Impacts

The WCS disposal facility would have a peak contracting construction force of about 40 full-time workers with an expected range of 30 to 50 persons and operations would have approximately 38 permanent WCS workers (WCS, 2004). The source of employees (both contracting and WCS employees) would likely be filled by residents in the region. The slight population increases predicted by WCS from constructing and operating the disposal cells would have small impacts to the housing and community services in the region of influence. Cumulative impacts from contract personnel would be small due to the minimal incremental increase from current contracting labor forces in the vicinity already servicing the ongoing construction at UUSA. The additional permanent employment at WCS cumulated with the additional minimal UUSA employees represents a small impact to the region.

For the IIFP, preconstruction activities were assumed to begin in 2011 and to conclude prior to the end of 2011. Initially 35 and later as many as 70 workers would be involved in preconstruction activities. During preconstruction, the work force would consist of heavy equipment operators and structural crafts, most of which are expected to come from the local area. Preconstruction activities are expected to result in impacts that would be approximately one-fourth to one-half the impacts for Phase 1 construction. As such, the NRC staff found in the EIS that there would be a correspondingly small impact on housing, taxes, infrastructure and community services (IIFP, 2011a). Phase 2 would use a contractor crew of 150 to 180 workers. IIFP estimates approximately 27 workers of the contracting work force are expected to move into the vicinity as new residents (15 percent of 180 workers). The increases in area population during Phase 2 construction, therefore, would be approximately the same as Phase 1 construction and the NRC staff found that those increases would have small impacts to socioeconomic resources. The Phase 2 operations of the IIFP facility would require a maximum of 40 additional workers (IIFP, 2009). Using the same assumptions for the Phase 1 operations workforce, the NRC staff assumed that 32 workers would already reside in the area, and that 8 would in-migrate. Given the excess housing, public utilities and capacity in local schools, the NRC staff concluded that socioeconomic impacts from Phase 2 operations would be small. It is likely, given the required construction skills and trades, and location that the IIFP construction activities and UUSA continuing construction would draw from the same labor force. The cumulative impact of the additional contractor forces would be moderate as previously evaluated for the UUSA expansion.

No other large-scale projects are anticipated in the near future that would significantly impact the socioeconomics of Lea County, New Mexico, or Andrews and Gaines Counties, Texas. Therefore, cumulative impacts would be MODERATE. Impacts from the construction and operation of WCS disposal facility and IIFP would be cumulative to the UUSA impacts and would continue to be moderate.

4.10.7 Comparative Socioeconomic Impacts of No Action Scenarios

ER Chapter 2, Alternatives, provides a discussion of possible alternatives to the construction and operation of the UUSA, including an alternative of "no action," i.e., not expanding the capacity of the UUSA facility. The following information provides comparative conclusions specific to the concerns addressed in this subsection for each of the three "no action" scenarios addressed in ER Section 2.3 and Table 2.3-2, Comparison of Environmental Impacts for the Proposed Action and the No-Action Scenarios.

No-Action Scenario B – No UUSA capacity expansion and no additional enrichment capacity is constructed by others. No additional socioeconomic impacts at the UUSA site or at other potential sites.

No-Action Scenario C – No UUSA capacity expansion, facility operates at 3.0 MSWU. Additional enrichment capacity is supplied by a combination of the construction and operation of Eagle Rock in Idaho Falls, ID (proposed capacity 3 MSWU) and GLE in Wilmington, NC (proposed capacity 6 MSWU). The socioeconomic resource impact would be increased due to construction and clearing on two additional sites. The socioeconomic resource impacts for these two additional projects are evaluated in the individual environmental impact statements for the projects.

No-Action Scenario D – No UUSA capacity expansion, facility operates at 3.0 MSWU. Additional enrichment capacity is supplied by a combination of the construction and operation of Eagle Rock in Idaho Falls, ID (proposed capacity 3 MSWU), GLE in Wilmington, NC (proposed capacity 6 MSWU), and ACP in Piketon, OH (planned capacity 3.7 MSWU). The socioeconomic resource impact would be increased due to construction and clearing on three additional sites. The socioeconomic resource impacts for these three additional projects are evaluated in the individual environmental impact statements for the projects.

4.10.8 Section 4.10 Tables

Table 4.10-1 Annual Contractor Salary

Workers	Annual Worker Salary			Workers
Year	**$0-33,999**	**$34,000-49,999**	**>$50,000**	**Average No./Yr.**
2012	120	200	480	800
2013	120	200	480	800
2014	120	200	480	800
2015	120	200	480	800
2016	120	200	480	800
2017	100	200	400	700
2018	100	200	400	700
2019	100	100	300	500
2020	60	80	160	300

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Table 4.10-2 Estimated Tax Revenue

Tax	Estimated Payments Over the Life of the 10 MSWU Plant		
	Low Estimate	High Estimate	Actual Thru 2012
Gross Receipts	$67,200,000	$100,800,000	$77,728,625
NM Corporate Income Tax[1]	$820,800,000	$972,800,000	- -
Corporate Franchise Tax	$1,000	$1,000	- -
NM Withholding Tax	$25,000,000	$25,000,000	$7,943,648
NM Unemployment Insurance	$15,000,000	$15,000,000	$428,844
NM Property Tax[2]	$222,200,000	$312,900,000	$7,826,735
Total	$1,150,201,000	$1,426,501,000	$93,927,852

(1) Based on average income

(2) Average

Table 4.10-3 Estimated Tax Revenue Allocations [1][2]

Tax	State of New Mexico	Lea County	Eunice, NM	Total
Estimated Gross Receipts Tax				
High	$95,760,000	$5,040,000	NA[3]	$100,800,000
Low	$63,840,000	$3,360,000	NA[3]	$67,200,000
NM Corporate Income Tax[4] Estimated total payments over the life of the 10 MSWU plant				
High	$972,800,000	NA[5]	NA[5]	$972,800,000
Low	$820,800,000	NA[5]	NA[5]	$820,800,000
NM Corporate Franchise Tax[6] Estimated total payments over the life of the 10 MSWU plant	$1,000	--	--	$1,000
NM Withholding Tax Estimated total payments over the life of the 10 MSWU plant	$25,000,000	NA[5]	NA[5]	$25,000,000
NM Unemployment Insurance Estimated total payments over the life of the 10 MSWU plant	$15,000,000	NA[5]	NA[5]	$15,000,000
NM Property Tax[7]				
High (Estimated total payments over the life of the 10 MSWU plant)	--	$312,900,000	NA[3]	$312,900,000
Low (Estimated total payments over the life of the 10 MSWU plant)	--	$222,200,000	NA[3]	$222,200,000

(1) Inflation is not included in any estimate.
(2) Tax rates are based on tax rates as of August 2012.
(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 10 MSWU 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.

4.11 Environmental Justice

This section examines whether there are disproportionately high minority or low-income populations residing within a 6.4-km (4-mi) radius of the UUSA site for which further examination of environmental impacts to determine the potential for environmental justice concerns is warranted.

Data presented in the initial environmental justice evaluation was primarily sourced from the United States 2000 Census. Where available, data from the 2010 decennial census has been considered in this section of the ER. Where 2010 decennial census data had not yet been published, data from the previous ER, the 2000 Census, and/or data from the U.S. Census Bureau American Community Survey (ACS) data has been referenced.

As discussed below, no minority or low-income populations were identified that would require further analysis of environmental justice concerns under the criteria established by the NRC.

4.11.1 Procedure and Evaluation Criteria

Evaluation of environmental justice for the UUSA facility capacity expansion has considered the environmental justice evaluation of the initial NRC Environmental Impact Statement (EIS) published prior to the initial UUSA site construction, the Draft EIS (DEIS) for the Proposed International Isotope Fluorine Extraction Process and Depleted Uranium Deconversion Plant (International Isotope Fluorine Product [IIFP]), a site located within 20 miles of the UUSA site, and data gathered from the U.S. Census Bureau.

The environmental justice studies in the initial EIS were considered in approval of licensure for construction, operation and decommissioning of the UUSA facility at a nominal capacity of 3.0 MSWU. The EIS described the evaluation of potential issues of environmental justice as SMALL (NRC, 2005). The environmental justice study reported in the EIS concluded the following:

> *"Although the impacts to the general population were SMALL to MODERATE, an examination of the various environmental pathways by which low-income and minority populations could be affected found no disproportionately high and adverse impacts from construction, operation, or decommissioning on minority and low-income populations living near the proposed NEF or along the transportation routes into and out of the proposed NEF."*

The environmental justice study examined whether there was disproportionately high minority or low-income populations residing within a 6.4-kilometer (km) (4-mile) radius of the UUSA facility for which further examination of environmental impacts to determine the potential for environmental justice concerns was warranted. The evaluation was performed using population and economic decennial census 2000 data available from the U. S. Census Bureau for that area, and was done in accordance with the procedures contained in NUREG-1748. This guidance was endorsed by the NRC's draft Policy Statement on the Treatment of Environmental Justice Matters in NRC Regulatory and Licensing Actions (FR, 2003). The evaluation concluded: *"...no minority or low-income populations were identified that would require further analysis of environmental justice concerns under the criteria established by the NRC."*

UUSA compared minority group and low-income population percentage data to their counterparts for their respective county and state. These comparisons were made pursuant to the "20%" and "50%" criteria contained in Appendix C to NUREG-1748 to determine: (1) if any individual census block group (CBG) contained a minority population group, aggregate minority population, or low-income household percentage that exceeded its county or state counterparts by more than 20 percentage points; and (2) if any CBG was comprised of more than 50% minorities (either by individual group or in the aggregate) or low-income households. Based on its comparison of the relevant CBG data to their county and state counterparts, the evaluation concluded:

> *"...no further evaluation of potential environmental justice concerns is necessary, as no CBG within the 6.4-km (4-mi) radius of the NEF site contained a minority or low-income population exceeding the NUREG-1748 "20%" or "50%" criteria"* and *"... LES has concluded that no disproportionately high minority or low-income populations exist that would warrant further examination of environmental impacts upon such populations."*

The environmental justice analysis in the DEIS for the Proposed IIFP site, also located in Lea County, New Mexico, focused on census blocks and block groups in an area within 80 km (50 miles) of the proposed IIFP site. The IIFP DEIS concluded:

> *"The largest minority population within 80 kilometers (50 miles) of the proposed site is the Hispanic/Latino population. The nearest minority or low-income population as defined by NRC criteria is 22.5 km (14 mi) from the proposed site. The impacts of IIFP construction and operation on resources would be SMALL and, in most cases, localized. Therefore, because all impacts would be SMALL, and the identified minority and low-income populations are not in close proximity to the proposed site, impacts would not be disproportionately high and adverse for any populations in the region, including minority or low-income populations."* (NRC, December 2011)

The NRC staff determined in the proposed IIFP site DEIS that impacts of the facility on tax revenues, housing, and community services in Lea and Eddy Counties in New Mexico, where most immigrating construction and operations workers are likely to live, and where the majority of economic impacts would occur would be SMALL and positive during the construction and operation of proposed IIFP facility; and where not positive, would still be SMALL. The IIFP DEIS concluded: *"...decommissioning of the proposed IIFP facility would provide short-term employment. All resource impacts are SMALL and the identified minority and low-income populations are not in close proximity to the proposed site, so impacts would not be considered disproportionately high and adverse for any populations in the region, including minority or low-income populations."* (NRC, December 2011)

A minority or low-income community may be considered as either a population of individuals living in geographic proximity to one another or a dispersed/transient population of individuals (e.g., migrant workers) where either type of group experiences common conditions of environmental exposure (NRC, 2003). NUREG-1748 defines minority categories as American Indian or Alaskan Native, Asian, Native Hawaiian or other Pacific Islander, African American (not of Hispanic or Latino origin), some other race, and Hispanic or Latino ethnicity (of any race) (NRC, 2003). The 2000 Census introduced a multiracial category. Anyone who identifies themselves as white and a minority is counted as that minority group. Individuals that identify themselves as more than one minority are counted in a "two or more races" group (NRC, 2003). Low-income is defined as being below the poverty level as defined by the U.S. Census Bureau (NRC, 2003).

According to the U.S. Census Bureau's Overview of Race and Hispanic Origin: 2010 (March 2011), the minority population in the United States grew by 29% in the period 2000-2010 (USCB, 2012). The most significant minority population growth between 2000 and 2010 was measured in the South census region, which includes Texas, and the West census region, which includes New Mexico. Minority population grew by 34% in the South and 29% in the West. More than 50% of the population of the states of New Mexico and Texas is reported as minority in 2010 census data. The U.S. Census Bureau reports: *"During the past 10 years, it has been the Hispanic population and the Asian population that have grown considerably, in part due to relatively higher levels of immigration."*

This environmental justice assessment assumes that the proposed facility capacity expansion will occur within the current boundaries of the existing UUSA site property. Furthermore, it is assumed that expansion construction activities will be similar to the construction activities associated with the initial development of the UUSA site, as considered in the initial environmental justice evaluation (UUSA, 2012), and that resource needs and workforce needs will be of similar scale to the ongoing construction of the UUSA.

The permanent increase in employment, income and population in the area associated with the start-up and current operation of the UUSA facility would be at least sustained with the proposed facility capacity expansion. The average number of workers employed for operation of the UUSA is assumed to continue to be approximately 250, rising slightly to 258 to accommodate additional UUSA employees through the facility capacity expansion to 10 MSWU.

Potential impacts to local economy, housing, schools and public services are not expected to be different from the SMALL impacts previously evaluated (NRC, 2005). The primary labor market for the construction of the proposed facility capacity expansion would continue to come from the same regions as the initial development of the UUSA site.

The determination of whether the potential for environmental justice concerns exists associated with the initial development of the UUSA site was made in accordance with the detailed procedures set forth in Appendix C to NUREG-1748. Census data from the 2000 decennial census were obtained from the U. S. Census Bureau on the minority and low-income populations residing within a 6.4-km (4-mi) radius (i.e., 130 km^2 or 50 mi^2) of the center of the UUSA site. These data were obtained by census block group (CBG), and include (for minority populations) percentage totals within each census block group for both each individual minority population group (i.e., African-American, Hispanic, Native American) and for the aggregate minority population. For low-income households (defined in NUREG-1748 as those households falling below the U.S. Census Bureau-specified poverty level), only the total percentage of such households within each CBG was obtained. The low income household data used in the evaluation was for 1999. In examining alternative sites for the UUSA facility, environmental justice was considered as part of the overall site selection process. The above-described minority and low-income population percentage data were compared to their counterparts for their respective county and state. These comparisons were made pursuant to the "20%" and "50%" criteria contained in Appendix C to NUREG-1748, to determine (1) if any individual CBG contained a minority population group, aggregate minority population, or low-income household percentage that exceeded its county or state counterparts by more than 20 percentage points; and (2) if any CBG was comprised of more than 50% minorities (either by individual group or in the aggregate) or low-income households.

Based on its comparison of the relevant CBG data to their county and state counterparts, as discussed below, it determined that no further evaluation of potential environmental justice concerns was necessary, as no CBG within the 6.4-km (4-mi) radius of the UUSA site contained a minority or low-income population exceeding the NUREG-1748 "20%" or "50%" criteria. This evaluation has been updated to consider the data provided by the 2010 US Census.

4.11.2 Results

The 130-km^2 (50-mi^2) area around the UUSA site includes parts of both Lea County, New Mexico and Andrews County, Texas (Figure 3.10-1, Site Location-Nearby Counties). Within that area, there are two census tracts (one in each county and one census block group (CBG) in each census tract).

The previous evaluation presented data for Census Tract 8, CBG 2 for the Lea County, New Mexico area of impact and data for Census Tract 9501, CBG 4 for the Andrews County, Texas area of impact. Data from the 2010 Census was reviewed and evaluated for the proposed UUSA facility capacity expansion. The 2010 Census provides data for Census Tract 8, CGB 2 for the Lea County, New Mexico area of interest; however, the 2010 Census Tract for the Andrews County, Texas area of interest, Census Tract 9501, includes only one census block group, CBG 1. Data for these CBGs is presented in Table 4.11-1, Minority Population 2010.

At the time of the initial evaluation prior to construction and operation of the UUSA facility, the largest minority group was Hispanic or Latino, accounting for 42.1% of the total population in New Mexico and 32.0% in Texas. In Lea County, New Mexico, the highest percentage of a minority population, at 39.6%, was also Hispanic or Latino. In Andrews County, Texas, Hispanic or Latino was the largest minority group as well at 40.0%. Review of 2010 Census data reveals the largest minority group remains the Hispanic or Latino group, accounting for 46.3% of the total population in New Mexico and 37.6% in Texas. Hispanic or Latino represents the largest minority group in both Lea County, New Mexico and Andrews County, Texas at 51% and 48.7%, respectively.

The initial evaluation demonstrated no individual CBG and the 130-km^2 (50-mi^2) area around the UUSA site was comprised of more than 50% of any minority population. With respect to the Hispanic or Latino population, the largest minority population in both census tracts were 24.8% in Census Tract 8, CGB 2 and 19.8% in Census Tract 9501, CBG 4. The largest minority group in the 130-km^2 (50-mi^2) area around the UUSA site was Hispanic or Latino, accounting for 11.7%. Moreover, none of these percentages exceeded the applicable State or County percentages for this minority population by more than 20 percentage points. Census 2010 data shows that Hispanic or Latino remains the largest minority population group in the CBGs reviewed, with 34.9% in Census Tract 8, CBG 2 and 48.7% in Census Tract 9501, CBG 1. None of these percentages exceeded the applicable State or County percentages for this minority population by more than 20 percentage points.

While review of 2010 Census data indicates growth of the Hispanic or Latino minority group in the counties surrounding the UUSA site since 2000, the growth of the Hispanic or Latino minority group in the counties surrounding the UUSA site is not disproportionate to the growth of this minority group in Texas and New Mexico, and across the United States. The proposed facility capacity expansion would not present disproportionately high or adverse impacts from construction, operation or decommissioning on minority and low-income populations living near the UUSA site.

The initial evaluation prior to construction and operation of the UUSA facility demonstrated that no individual CBG is comprised of more than 50% of low-income households. The percentages are as follows: Tract 8, CBG 2 –3.6%; Tract 9501, CBG 4- 9.9%. Neither of these percentages exceeded 50 percent; moreover, neither of these populations significantly exceeds the percentage of low-income households in the applicable State or County. Low income (poverty) data is only compiled down to the CBG level and, therefore, data was not available for only the 130-km^2 (50-mi^2) area around UUSA.

Recent poverty data for the area of impact is generally similar to that documented in the initial evaluations prior to site construction and operation. American Community Survey (ACS) 5-year estimate economic data for the period 2006-2010 shows the percent of individuals and households below poverty level in Lea County and the state of New Mexico has remained steady or has decreased. The percent of individuals below the poverty level in Andrews County, Texas has increased slightly, by less than one percentage point, while the percent of households below the poverty level has decreased. Data for the state of Texas shows increases in the percent of individuals and households below the poverty level, by approximately 1 percentage point. The ACS data shows increases in individual and household incomes in Lea and Andrews Counties and in New Mexico and Texas. Income and poverty data is presented in Table 3.10-4, Area Income Data, 2006-2010 of the Socioeconomic section of this document.

Based on this analysis of the above-described data, no disproportionately high minority or low-income populations exist that would warrant further examination of environmental impacts upon such populations.

The proposed facility capacity expansion would sustain construction-related employment positions through the year 2020. The regional economy would continue to benefit from the capital investment expenditures and recurring costs associated with the proposed facility capacity expansion construction and with the proposed increased operation of the UUSA facility. Operations workforce would increase slightly with increased production capacity, and workers are anticipated to continue to spend earnings on goods and services within the region of the UUSA site.

4.11.3 Cumulative Impacts

Environmental justice analysis performed on the potential cumulative impacts concluded there would be no disproportionally high-minority and low-income populations that exist warranting further examination of environmental impacts to those populations. It is unlikely that minority and low-income persons would be disproportionately affected by adjacent activities at WCS and Lea County Landfill or by the IIFP facility in Hobbs. Any impacts from traffic during construction of the disposal cells by WCS would be short termed and small.

4.11.4 Comparative Environmental Justice Impacts of No-Action Scenarios

ER Chapter 2, Alternatives, provides a discussion of possible alternatives to the capacity expansion construction and operation of UUSA, including an alternative of "no action," i.e., not expanding the current capacity. The following information provides comparative conclusions specific to the concerns addressed in this subsection for each of the three "no action" scenarios addressed in ER Section 2.3 and Table 2.3-2, Comparison of Environmental Impacts for the Proposed Action and the No-Action Scenarios.

No-Action Scenario B – No UUSA capacity expansion and no additional enrichment capacity is constructed by others. No environmental justice impacts at the UUSA site or at other potential sites.

No-Action Scenario C – No UUSA capacity expansion, facility operates at 3.0 MSWU. Additional enrichment capacity is supplied by a combination of the construction and operation of Eagle Rock in Idaho Falls, ID (proposed capacity 3 MSWU) and GLE in Wilmington, NC (proposed capacity 6 MSWU). The environmental justice impact may be increased due to construction and operation at two additional sites. The environmental justice impacts for these two additional projects are evaluated in the individual environmental impact statements for the projects.

No-Action Scenario D – No UUSA capacity expansion, facility operates at 3.0 MSWU. Additional enrichment capacity is supplied by a combination of the construction and operation of Eagle Rock in Idaho Falls, ID (proposed capacity 3 MSWU), GLE in Wilmington, NC (proposed capacity 6 MSWU), and ACP in Piketon, OH (planned capacity 3.7 MSWU). The environmental justice impact may be increased due to construction and operation at three additional sites. The environmental justice impacts for these three additional projects are evaluated in the individual environmental impact statements for the projects.

4.11.5 Section 4.11 Tables

Table 4.11-1 Minority Population, 2010						
Geographic Area	New Mexico	Lea County	NM Census Tract 8, Block Group 2 (year 2010)	Texas	Andrews County	TX Census Tract 9501, Block Group 1 (year 2010)
Total:	2,059,179	64,727	727	25,145,561	14,786	1,678
Not Hispanic or Latino	1,105,776	31,664	473	15,684,640	7,591	1195
Percent	53.7%	49.0%	65.1%	62.4%	51.3%	71.2%
White alone	83,810	27,845	671	11,397,345	7,083	1507
Percent	40.5%	43.0%	92.3%	43.3%	48%	89.8%
Black or African American alone	42,550	2,399	4	2,886,825	199	6
Percent	2.1%	3.7%	0.55%	11.5%	1.3%	0.36%
State percentage difference	0.0%	1.6%	-1.55%	0.0%	-10.2%	-11.4%
County percentage difference	N/A	0.0%	-3.15%	N/A	0.0%	-0.94%
American Indian and Alaska Native alone	175,368	468	2	80,586	95	6
Percent	8.5%	0.7%	0.28%	0.3%	0.6%	0.36%
State percentage difference	0.0%	-7.8%	-8.2%	0.0%	0.3%	-0.06%
County percentage difference	N/A	0.0%	-0.42%	N/A	0.0%	-0.24%
Asian alone	28,208	302	0	948,426	85	26
Percent	1.37%	0.5%	0.0%	3.8%	0.6%	1.5%
State percentage difference	0.0%	-0.87%	-1.37%	0.0%	-3.2%	-2.3%
County percentage difference	N/A	-0.0%	-0.5%	N/A	0.0%	0.9%
Native Hawaiian and Other Pacific Islander alone	1,246	18	0	17,920	1	0
Percent	0.06%	0.03%	0.0%	0.07%	0.0%	0.0%
State percentage difference	0.0%	-0.03%	-0.06%	0.0%	-0.07%	-0.07%
County percentage difference	N/A	0.0%	-0.03%	N/A	0.0%	0.0%
Some other race alone	3,750	51	32	33,980	17	99
Percent	0.18%	0.08%	4.4%	0.14%	0.1%	5.9%
State % difference	0.0%	-0.1%	4.2%	0.0%	-0.3%	5.8%

Table 4.11-1 Minority Population, 2010

Geographic Area	New Mexico	Lea County	NM Census Tract 8, Block Group 2 (year 2010)	Texas	Andrews County	TX Census Tract 9501, Block Group 1 (year 2010)
County percentage difference	N/A	0.0%	4.3%	N/A	0.0%	5.8%
Two or more races	29,835	581	18	319,558	111	34
Percent	1.4%	0.9%	2.5%	1.3%	0.75%	2.0%
State percentage difference	0.0%	-0.5%	1.1%	0.0%	-0.55%	0.7%
County percentage difference	N/A	0.0%	1.6%	N/A	0.0%	1.25%
Hispanic or Latino:	953,403	33,063	254	9,460,921	7,195	483
Percent	46.3%	51%	34.9%	37.6%	48.7%	28.8%
State percentage difference	0.0%	4.7%	-11.4%	0.0%	11.1%	-8.8%
County percentage difference	N/A	0.0%	-16.1%	N/A	0.0%	-19.9%
Total Minority	1,204,525	36,301	292	13,428,658	7,592	616
Percent	58.5%	56.1%	40.17%	53.4%	51.3%	36.7%
State percentage difference	0.0%	-2.4%	-18.3%	0.0%	-2.1%	-16.7%
County percentage difference	N/A	0.0%	-15.9%	N/A	0.0%	-14.6%

4.11.6 Section 4.11 Figures

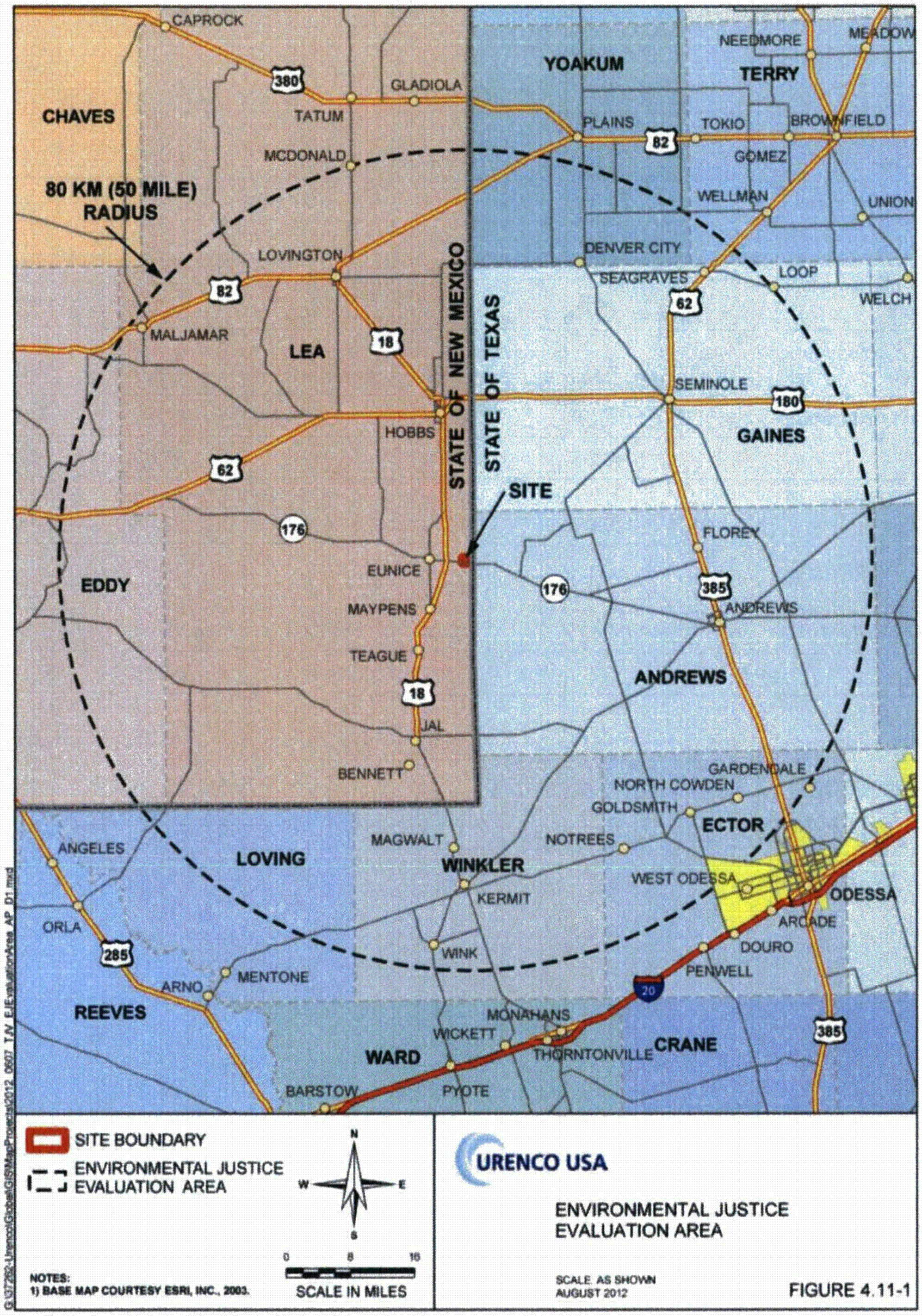

Figure 4.11-1 Environmental Justice Evaluation Area

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4.12 Public and Occupational Health Impacts

4.12.1 Nonradiological Impacts

The proposed expansion will increase the quantity of nonradiological effluents at the UUSA site, but they will continue not to exceed criteria in 40 CFR 50, 59, 60, 61, 122, 129, or 141. Details of radiological gaseous and liquid effluent impacts and controls are listed in ER Section 4.12.2, Radiological Impacts. A detailed list of the chemicals that will be used at UUSA, by building, is contained in ER Tables 2.1-2 through 2.1-4. ER Figure 2.1-4 and 4.12-2 indicate where these buildings are located on the UUSA site.

4.12.2 Radiological Impacts

Sources of potential radiation exposure at the current UUSA facility to workers are described in the LES ER Section 4.12.2, as well as UUSA's radiation protection program. Sources of potential radiation exposure at the current UUSA facility to the general public and the environment are also described in the LES ER Section 4.12.2. UUSA's effluent monitoring and environmental monitoring/sampling programs provide data to identify and assess plant's contribution to environmental uranium at UUSA and are described in Section 6.1 of this ER and the LES ER.

4.12.3 Pathway Assessment

There are three primary exposure pathways associated with plant effluent: (1) direct radiation due to deposited radioactivity on the ground surface (ground plane exposure), (2) inhalation of airborne radioactivity in a passing effluent plume, and (3) ingestion of food that was contaminated by plant effluent radioactivity. These pathways and the predicted exposures at the UUSA site are described in LES ER Section 4.12.2.1 and are incorporated by reference.

4.12.4 Routine Gaseous Effluent

The discharge of routine gaseous effluents is described in Section 4.12.2.1.1 of the LES ER and incorporated by reference. With both the current facility and the expansion, the release of uranium in extremely low concentrations is expected and raises the potential for radiological impacts to the general public and the environment. The total annual discharge of uranium in routine gaseous effluent from a similar designed 1.5 MSWU uranium enrichment facility was estimated to be less than 30 g (1.1 oz.) (NRC, 1994a). The uranium source term applied in the assessment of radiological impacts for routine gaseous effluent from that plant was 4.4×10^6 Bq (120 μCi) per year. It was noted that actual uranium discharges in gaseous effluent for European facilities with similar design and throughput are significantly lower (i.e., < 1×10^6 Bq (28 μCi) per year) (NRC, 1994a). As a conservative assumption for assessment of potential radiological impacts to the general public, the uranium source term used in the assessment of radiological impacts for routine gaseous effluent releases from the UUSA was taken as 8.9 MBq (240 μCi) per year, which is equal to twice the source term applied to the 1.5 MSWU plant described in NUREG-1484 (NRC, 1994a). In comparison, the operating history of gaseous emissions from the URENCO Capenhurst facility in the United Kingdom averaged over a four-year period (1999 to 2002) indicates an average annual release to the atmosphere of uranium of about only 0.1 MBq (2.8 μCi) (URENCO, 2001; URENCO, 2002a). Since the Capenhurst facility is less than half the size of the initially evaluated UUSA, scaling their annual release by a conservative factor of 3 suggests that the expected annual releases could be about 0.31 MBq (8.4 μCi) of uranium, or about 28 times smaller than the 8.9 MBq (240 μCi) bounding condition that is used in this assessment. Evaluation for the current proposed facility expansion to 10 MSWU would scale the Capenhurst facility emissions by 10 for expected releases of 1.0 MBq

(28 μCi) which is still less than the bounding condition initially evaluated prior to site construction.

Effluent monitoring began in January of 2009 and the results routinely reported to the NRC in the Semi-Annual Radioactive Effluent Release Reports (SARERR).

- UUSA Semi-Annual Radioactive Effluent Release Report Jan 09 through Jun 09 dated August 26, 2009 (NEF-09-00164-NRC)
- UUSA Semi-Annual Radioactive Effluent Release Report Jul 09 through Dec 09 dated February 26, 2010 (LES-10-00042-NRC)
- UUSA Semi-Annual Radioactive Effluent Release Report Jan 10 through Jun 10 dated September 24, 2010 (LES-10-00202-NRC)
- UUSA Semi-Annual Radioactive Effluent Release Report Jul 10 through Dec 10 dated February 23, 2011 (LES-11-00014-NRC)
- UUSA Semi-Annual Radioactive Effluent Release Report Jan 11 through Jun 11 dated August 24, 2011 (LES-11-00121-NRC)
- UUSA Semi-Annual Radioactive Effluent Release Report Jul 11 through Dec 11 dated March 1, 2012 (LES-12-00031-NRC)
- UUSA Semi-Annual Radioactive Effluent Release Report Jan 12 through Jun 12 dated August 20, 2012 (LES-12-00130-NRC)

During periods for which URENCO USA has had Uranium Hexafluoride (UF_6) on site (beginning with 1st quarter 2009) there has not been a detectable release of Uranic material in excess of the Lower Limits of Detection (LLD) or Minimum Detectable Activity (MDA) in the Liquid or Gaseous Effluents that are routinely monitored. It should be noted that the current waste stream volume is well below projections due to the Cylinder Receipt and Dispatch Building (CRDB) Chemistry Laboratories becoming operational only recently (February 2013). The Decontamination Systems are not yet approved for operation, and is a contributing factor to the limited waste stream volume.

4.12.5 Liquid Effluent

The operation of UUSA includes liquid waste processing to collect and solidify the uranic materials that are collected as part of process operations. The remaining liquid effluent is solidified prior to off-site disposal. LES ER Section 2.1.2, Proposed Action, provides an overview of the liquid waste treatment system. Because of the plant design and the site's geology, with normal operations, there is not a release pathway related to the routine liquid effluents. See LES ER Section 4.12.2.1.1. This will not change with the proposed expansion.

4.12.6 Direct Radiation Impacts

Storage of feed, product and UBCs at UUSA may have an impact due to direct and scatter (sky shine) radiation to the site boundary, and to lesser extents, offsite locations. The UBC Storage Pad is the most significant portion of the total direct dose equivalent and with the expansion, will increase from 2.6 acres to 23 acres to accommodate storage of up to 25,000 DUF_6 cylinders.

The direct dose equivalent from the accumulation of 25,000 cylinders of UBC generation was calculated with the MCNP5 computer code (UUSA CALC-S-00141, Rev 1). The conceptual layout of the UBC Storage Pads is shown in Figure 4.12-3, UBC Pad Dose Equivalent Isopleths (2,000 Hours Per Year Occupancy). For purposes of evaluation the cylinders were assumed to be in a triple stack configuration for storage on the pad. The calculation does not explicitly model empty 48Y feed cylinders. To protect both workers and the public from receiving excess dose, per the ALARA principle the empty feed cylinders are placed away from the edges of the UBC Storage Pad and inside the array of full cylinders to allow for shielding from the surrounding filled cylinders. Direct dose from cylinders stored in the existing Cylinder Receipt and Dispatch Building (CRDB) has also been included in the UBC Pad Dose Equivalent Isopleths by adding the effective dose to that modeled from the pad. The dose contribution for the CRDB was based on the initial evaluation of dose for this source (AREVA document 32-2400561-00).

All radiation transport calculations of the storage cylinders were performed with the general purpose three-dimensional continuous energy Monte Carlo code MCNP5. The cell tally, F4, was utilized in this calculation for detector placements. MCNP calculated fluxes were converted to dose rates using the ANSI/ANS 6.1.1-1 1977 flux-to-dose conversion factors. The MCNP5, version 1.40, is approved for QL-1 application, as documented in QA Evaluation Report 2009-E-1 1-149 [19], for radiation transport evaluations. The MCNP tally multipliers in the input files account for source strength and the number of cylinders. In addition, TLD measurements have been collected to evaluate photon and neutron dose on the UBC Storage Pad. This information was subsequently utilized to evaluate conservative assumptions in the Monte Carlo calculation.

The regulatory dose equivalent limit for areas beyond the UUSA fence boundary is 0.25 mSv (25 mrem) per year (including direct and effluent contributions) including the contribution from cylinders stored in the CRDB to a member of the public.

The annual offsite dose equivalent was calculated at UUSA fence line assuming 2,000 hours per year occupancy. Implicit in the use of 2,000 hours is the assumption that the dose equivalent is to a non-resident (i.e., a worker at an unrelated business). The annual dose equivalents for the actual nearest worksite and at the nearest residence were also calculated.

The annual dose equivalent due to external radiation from the UBC Storage Pad (skyshine and direct) is estimated to be less than 3.8×10^{-2} mSv (3.8 mrem) to the maximally exposed person at the nearest point on the western site boundary (2,000 hrs/yr) , approximately 9.3×10^{-2} mSv (9.3 mrem) for the maximally exposed person to the north boundary (2000 hours/yr). Initial evaluations of dose to the maximally exposed resident (8,760 hrs/yr) located approximately 4.3 km (2.63 mi) from the UBC Storage Pads were calculated to be less than 8×10^{-12} mSv/yr (8×10^{-10} mrem/yr). This value is bounding for the assessment of impacts, because the total dose at the property lines is less than was initially evaluated for the facility and the location of the nearest resident has not changed since the initial evaluation.. Figure 4.12-3, UBC Pad Dose Equivalent Isopleths (2,000 Hours per Year Occupancy) shows the dose equivalent contours for the summed contributions from the UBC Storage Pad (UUSA CALC-S-00141, Rev 1) and the CRDB for 2,000 hours/year occupancy (AREVA document 32-2400561-00). Figure 4.12-4, UBC Pad Dose Equivalent Isopleths (8,760 Hours per Year Occupancy), indicates the dose equivalent contours assuming full-time occupancy. LES ER Table 4.12-1, Direct Radiation Annual Dose Equivalent by Source, summarizes the annual dose equivalents by source (UBC Storage Pad and CRDB) at different locations as evaluated prior to the initial construction.

4.12.7 Population Dose Equivalents

The estimated population dose equivalents are described in Section 4.12.2.1.4 of the LES ER. Taking into account the small shifts in population revealed in the 2010 census discussed in ER

Section 3.10, these estimated population dose equivalents remain applicable and are incorporated by reference.

4.12.8 Mitigation Measures

Although routine operations at UUSA create the potential for radiological and nonradiological impacts on the environment and members of the public, plant design has incorporated features to minimize gaseous and liquid effluent releases and to keep them well below regulatory limits. These features are described in Section 4.12.1.5 of the LES ER.

Under routine operations, the potential that radioactivity from the UBC Storage Pad may impact the public is low because the UBCs are surveyed for external contamination before they are placed on the storage pad. Therefore, rainfall runoff from the pad is not expected to be a significant exposure pathway. Runoff water from the UBC Storage Pad is directed from the UBC Storage Pad to onsite retention basins for evaporation of the collected water. Periodic sampling of the soil from the basin is performed to identify accumulation or buildup of any residual UBC surface contamination washed off by rainwater to the basin (see ER Section 6.1, Radiological Monitoring). No liquids from the retention basin are discharged directly offsite. In addition, direct radiation from the UBC Storage Pad is monitored on a quarterly basis using thermo-luminescent dosimeters (TLDs) and pressurized ion chamber measurements.

4.12.9 Public and Occupational Exposure Impacts

The assessment of the dose impacts resulting from the annual liquid and gaseous effluents for the UUSA site conducted prior to the initial construction is described in Section 4.12 of the LES ER. This assessment remains generally applicable and is incorporated by reference; only areas where the analysis has changed due to the expansion are discussed below.

There are two primary changes to the assumptions made in the LES ER: the Treated Effluent Evaporative Basin and the UBC Storage Pads. The LES ER discussion includes the treatment of liquid effluents which would have resulted in resuspended airborne particles from evaporation in the Treated Effluent Evaporative Basin, which is not part of the current operation and not considered as part of the future design. See LES ER Section 4.12.2.1.2 and ER Section 3.12.3. This was evaluated as an additional source of radiation that is not in fact present at the site. The calculations below also assume the existence of the Treated Effluent Evaporative Basin, thus building in additional conservatism.

LES ER Table 4.12-12, Annual Total Effective Dose Equivalent (All Sources), indicates that during the initial evaluation of the UUSA operation the dominant source of offsite radiation exposure was from direct (and scatter) radiation from the UBC Storage Pads (fixed source). For the proposed facility capacity expansion, this remains true. The maximum annual dose equivalent found along the north site boundary has been modeled during the evaluation for facility capacity expansion to 10 MSWU to have an estimated impact of 9.3×10^{-2} mSv /year (9.3 mrem/year) from storage of 25,000 UBC cylinders at the UBC Storage Pad. This calculated dose equivalent is well below the 1 mSv (100 mrem/yr) TEDE requirement per 10 CFR 20.1301, and also within the 0.25 mSv (25 mrem/yr) dose equivalent to the whole body and any organ as indicated in 40 CFR 190. It is therefore concluded that the operation of the UUSA site at the proposed facility expansion will not exceed the dose equivalent criteria for members of the public as stipulated in Federal regulations.

4.12.10 Environmental Effects of Accidents

All credible accident sequences were considered during the Integrated Safety Analysis (ISA) performed for the facility prior to facility construction and operation. For the proposed action of facility capacity expansion to 10 MSWU, no new accident scenarios were considered. The discussion of these accident sequences in Section 4.12.3.1 the LES ER is incorporated by reference.

4.12.11 Accident Mitigation Measures

Accident mitigation measures for the UUSA facility are described in Section 4.12.3.2 of the LES ER. They include design features to delay and reduce the UF_6 releases inside the buildings from reaching the outside environment, such as seismically designed portions of the UF_6 process piping and UF_6 process components, or automatic shutoff of building HVAC systems during a fire event. With mitigation, the dose equivalent consequences to the public for these accident sequences have been reduced to below an intermediate consequence as defined in 10 CFR 70.61.

4.12.12 Cumulative Impacts

Due to the nearly adjacent location, there will be a cumulative impact from the radiological dose at the proposed UUSA facility capacity expansion and the recently approved WCS low-level radioactive wastes disposal site in the State of Texas (an NRC Agreement State). The WCS disposal site is proposed to include approximately 16 acres of disposal cells and allow 1,160,000 cubic yards of waste disposal for a total radioactivity of 24,530 curies. WCS has evaluated total equivalent dose as 9.54 mrem/year for full year exposure by a resident at their fence line. This dose will be cumulative with the UUSA predicted dose equivalent. UUSA modeled the potential fenceline exposure to be 9.3 mrem for 2000 hours of exposure. Projecting that exposure in a linear extrapolation to a full year (>8000hrs) the impact would be approximately 38 mrem/yr. The cumulative impacts from both of these sources even if immediately adjacent would be less than the standard of 100 mrem/yr for a small cumulative impact.The IIFP facility will be located approximately 20 miles away from the UUSA facility and will therefore not have a cumulative impact with UUSA on public and occupational health. The cumulative collective radiological impacts to the offsite population, from all sources, would be SMALL by being below the 1 millisieverts (100 millirem) per year dose limit (10 CFR Part 20) to the offsite maximally exposed individual during the time of the construction, operation, and decommissioning of the proposed UUSA facility capacity expansion.

4.12.13 Comparative Public and Occupational Exposure Impacts of No-Action Scenarios

ER Chapter 2, Alternatives, provides a discussion of possible alternatives to the construction and operation of the UUSA, including an alternative of "no action," i.e., not expanding the *capacity of the UUSA facility. The following information provides comparative conclusions* specific to the concerns addressed in this subsection for each of the three "no action" scenarios addressed in ER Section 2.3 and Table 2.3-2, Comparison of Environmental Impacts for the Proposed Action and the No-Action Scenarios.

No-Action Scenario B – No UUSA capacity expansion and no additional enrichment capacity is constructed by others. No additional public and occupational health impacts at the UUSA site or at other potential sites.

No-Action Scenario C – No UUSA capacity expansion, facility operates at 3.0 MSWU. Additional enrichment capacity is supplied by a combination of the construction and operation of Eagle Rock in Idaho Falls, ID (proposed capacity 3 MSWU) and GLE in Wilmington, NC (proposed capacity 6 MSWU). The public and occupational health resource impact would be increased due to construction and operations on two additional sites. The public and occupational health resource impacts for these two additional projects are evaluated in the individual environmental impact statements for the projects.

No-Action Scenario D – No UUSA capacity expansion, facility operates at 3.0 MSWU. Additional enrichment capacity is supplied by a combination of the construction and operation of Eagle Rock in Idaho Falls, ID (proposed capacity 3 MSWU), GLE in Wilmington, NC (proposed capacity 6 MSWU), and ACP in Piketon, OH (planned capacity 3.7 MSWU). The public and occupational health resource impact would be increased due to construction and operations on three additional sites. The public and occupational health resource impacts for these three additional projects are evaluated in the individual environmental impact statements for the projects.

4.12.14 Section 4.12 Tables

Table 4.12-1 Direct Radiation Annual Dose Equivalent by Source (10 MSWU facility)

Location	Annual Occupancy (hours/year)			UBC Storage Pad and CRDB Total mSv/yr (mrem/yr)
Site Fence, North*	2,000			0.093 (9.3)
Site Fence west*	2,000			0.038 (3.8)
Nearest Actual Business, NNW 1.9 km (1.17 mi)**	2,000			$<6.0 \times 10^{-5}$ (6.0×10^{-3})
Nearest Actual Residence, West 4.3 km (2.63 mi)**	8,760			$<8.0 \times 10^{-12}$ (8.0×10^{-10})

* Distance from the closest edge of the pad.

**Distance from the center of the site.

Table 4.12-2 Population Data for the Year 2000

Population (All Ages) Distribution (2000 Census) Within 80 km (50 mi)

Sector	0-1.6 km (0-1 mi)	1.6-3.2 km (1-2 mi)	3.2-4.8 km (2-3 mi)	4.8-6.4 km (3-4 mi)	6.4-8.0 km (4-5 mi)	8.0-16 km (5-10 mi)	16-32 km (10-20 mi)	32-48 km (20-30 mi)	48-64 km (30-40 mi)	64-80 km (40-50 mi)	Totals
N	0	0	0	0	0	43	171	275	370	476	1,336
NNE	0	0	0	0	0	61	243	405	568	4,404	5,681
NE	0	0	0	0	0	61	243	405	3,523	3,064	7,296
ENE	0	0	0	0	0	61	188	405	3,523	730	4,906
E	0	0	0	0	0	33	132	220	308	396	1,089
ESE	0	0	0	0	0	33	132	220	9,960	396	10,741
SE	0	0	0	0	0	33	132	220	1,937	7,084	9,406
SSE	0	0	0	0	0	33	132	157	1,321	2,836	4,479
S	0	0	0	0	0	43	171	286	88	6,746	7,334
SSW	0	0	0	0	0	43	171	2,282	167	56	2,719
SW	0	0	0	0	0	43	171	286	400	266	1,166
WSW	0	0	11	6	0	43	171	286	400	537	1,454
W	0	0	11	52	1,286	1,324	171	286	400	537	4,067
WNW	0	0	0	0	0	43	171	286	400	520	1,420
NW	0	0	0	0	0	43	171	286	400	514	1,414
NNW	0	0	0	0	0	43	7,335	7,450	9,871	514	25,213
Ring Totals=	0	0	22	58	1,286	1,981	9,909	13,754	33,635	29,075	89,720
Cum. Totals =	0	0	22	80	1,366	3,347	13,256	27,009	60,644	89,720	

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Table 4.12-3 Collective Dose Equivalents to All Ages Population (Person-Sieverts)

(liquid and gas release pathways)

Population Dose Equivalent (All Ages - All Pathways) Within 80 km (50 mi) (Person-Sievert)

Sector	0-1.6 km (0-1 mi)	1.6-3.2 km (1-2 mi)	3.2-4.8 km (2-3 mi)	4.8-6.4 km (3-4 mi)	6.4-8.0 km (4-5 mi)	8.0-16 km (5-10 mi)	16-32 km (10-20 mi)	32-48 km (20-30 mi)	48-64 km (30-40 mi)	64-80 km (40-50 mi)	Totals
N	0.0	0.0	0.0	0.0	0.0	3.3E-07	4.4E-07	3.1E-07	2.5E-07	2.1E-07	1.5E-06
NNE	0.0	0.0	0.0	0.0	0.0	2.3E-07	3.1E-07	2.3E-07	1.9E-07	9.9E-07	2.0E-06
NE	0.0	0.0	0.0	0.0	0.0	1.4E-07	1.8E-07	1.4E-07	7.0E-07	4.0E-07	1.6E-06
ENE	0.0	0.0	0.0	0.0	0.0	1.3E-07	1.3E-07	1.3E-07	6.6E-07	9.1E-08	1.1E-06
E	0.0	0.0	0.0	0.0	0.0	7.5E-08	1.0E-07	7.7E-08	6.3E-08	5.4E-08	3.7E-07
ESE	0.0	0.0	0.0	0.0	0.0	6.3E-08	8.7E-08	6.6E-08	1.7E-06	4.6E-08	2.0E-06
SE	0.0	0.0	0.0	0.0	0.0	7.4E-08	1.0E-07	7.7E-08	4.0E-07	9.7E-07	1.6E-06
SSE	0.0	0.0	0.0	0.0	0.0	7.6E-08	1.0E-07	5.6E-08	2.8E-07	3.9E-07	9.0E-07
S	0.0	0.0	0.0	0.0	0.0	1.5E-07	2.0E-07	1.5E-07	2.7E-08	1.4E-06	1.9E-06
SSW	0.0	0.0	0.0	0.0	0.0	6.9E-08	9.3E-08	5.5E-07	2.3E-08	5.1E-09	7.4E-07
SW	0.0	0.0	0.0	0.0	0.0	7.3E-08	9.7E-08	7.1E-08	5.8E-08	2.5E-08	3.2E-07
WSW	0.0	0.0	1.0E-07	3.2E-08	0.0	6.9E-08	9.1E-08	6.7E-08	5.4E-08	4.8E-08	4.6E-07
W	0.0	0.0	1.7E-07	4.6E-07	7.7E-06	3.5E-06	1.5E-07	1.1E-07	9.3E-08	8.3E-08	1.2E-05
WNW	0.0	0.0	0.0	0.0	0.0	9.8E-08	1.3E-07	9.8E-08	7.9E-08	6.8E-08	4.8E-07
NW	0.0	0.0	0.0	0.0	0.0	1.4E-07	2.0E-07	1.5E-07	1.2E-07	1.0E-07	7.1E-07
NNW	0.0	0.0	0.0	0.0	0.0	2.2E-07	1.3E-05	5.9E-06	4.6E-06	1.6E-07	2.4E-05
Ring Totals=	0	0	2.7E-07	5.0E-07	7.7E-06	5.5E-06	1.5E-05	8.2E-06	9.3E-06	5.0E-06	5.2E-05
Cum. Totals =	0	0	2.7E-07	7.6E-07	8.4E-06	1.4E-05	2.9E-05	3.8E-05	4.7E-05	5.2E-05	

Table 4.12-4 Collective Dose Equivalents to All Ages Population (Person-rem) Based on Initial Site Evaluation

(liquid and gas release pathways)

Population Dose Equivalent (All Ages - All Pathways) Within 80 km (50 mi) (Person-rem)

Sector	0-1.6 km (0-1 mi)	1.6-3.2 km (1-2 mi)	3.2-4.8 km (2-3 mi)	4.8-6.4 km (3-4 mi)	6.4-8.0 km (4-5 mi)	8.0-16 km (5-10 mi)	16-32 km (10-20 mi)	32-48 km (20-30 mi)	48-64 km (30-40 mi)	64-80 km (40-50 mi)	Totals
N	0.0	0.0	0.0	0.0	0.0	3.3E-05	4.4E-05	3.1E-05	2.5E-05	2.1E-05	1.5E-04
NNE	0.0	0.0	0.0	0.0	0.0	2.3E-05	3.1E-05	2.3E-05	1.9E-05	9.9E-05	2.0E-04
NE	0.0	0.0	0.0	0.0	0.0	1.4E-05	1.8E-05	1.4E-05	7.0E-05	4.0E-05	1.6E-04
ENE	0.0	0.0	0.0	0.0	0.0	1.3E-05	1.3E-05	1.3E-05	6.6E-05	9.1E-06	1.1E-04
E	0.0	0.0	0.0	0.0	0.0	7.5E-06	1.0E-05	7.7E-06	6.3E-06	5.4E-06	3.7E-05
ESE	0.0	0.0	0.0	0.0	0.0	6.3E-06	8.7E-06	6.6E-06	1.7E-04	4.6E-06	2.0E-04
SE	0.0	0.0	0.0	0.0	0.0	7.4E-06	1.0E-05	7.7E-06	4.0E-05	9.7E-05	1.6E-04
SSE	0.0	0.0	0.0	0.0	0.0	7.6E-06	1.0E-05	5.6E-06	2.8E-05	3.9E-05	9.0E-05
S	0.0	0.0	0.0	0.0	0.0	1.5E-05	2.0E-05	1.5E-05	2.7E-06	1.4E-04	1.9E-04
SSW	0.0	0.0	0.0	0.0	0.0	6.9E-06	9.3E-06	5.5E-05	2.3E-06	5.1E-07	7.4E-05
SW	0.0	0.0	0.0	0.0	0.0	7.3E-06	9.7E-06	7.1E-06	5.8E-06	2.5E-06	3.2E-05
WSW	0.0	0.0	1.0E-05	3.2E-06	0.0	6.9E-06	9.1E-06	6.7E-06	5.4E-06	4.8E-06	4.6E-05
W	0.0	0.0	1.7E-05	4.6E-05	7.7E-04	3.5E-04	1.5E-05	1.1E-05	9.3E-06	8.3E-06	1.2E-03
WNW	0.0	0.0	0.0	0.0	0.0	9.8E-06	1.3E-05	9.8E-06	7.9E-06	6.8E-06	4.8E-05
NW	0.0	0.0	0.0	0.0	0.0	1.4E-05	2.0E-05	1.5E-05	1.2E-05	1.0E-05	7.1E-05
NNW	0.0	0.0	0.0	0.0	0.0	2.2E-05	1.3E-03	5.9E-04	4.6E-04	1.6E-05	2.4E-03
Ring Totals=	0	0	2.7E-05	5.0E-05	7.7E-04	5.5E-04	1.5E-03	8.2E-04	9.3E-04	5.0E-04	5.2E-03
Cum. Totals =	0	0	2.7E-05	7.6E-05	8.4E-04	1.4E-03	2.9E-03	3.8E-03	4.7E-03	5.2E-03	

Table 4.12-5A Annual and Committed Dose Equivalents for Exposures in Year 30 to an Adult from Gaseous Effluent (Nearest Resident) Based on Initial Site Evaluation

Source		Skin	Gonads	Breast	Lung	Red Bone Marrow	Bone Surface	Thyroid	Remainder	Effective Dose Equivalent
Cloud Immersion	(mSv)	2.3E-13	1.6E-13	1.9E-13	1.5E-13	1.4E-13	4.2E-13	1.6E-13	1.5E-13	1.7E-13
	(mrem)	2.3E-11	1.6E-11	1.9E-11	1.5E-11	1.4E-11	4.2E-11	1.6E-11	1.5E-11	1.7E-11
Inhalation	(mSv)	0.0E+00	9.2E-10	1.0E-09	1.0E-04	2.5E-08	3.9E-07	9.8E-10	3.7E-08	1.2E-05
	(mrem)	0.0E+00	9.2E-08	1.0E-07	1.0E-02	2.5E-06	3.9E-05	9.8E-08	3.7E-06	1.2E-03
Grd. Plane direct	(mSv)	1.9E-05	7.7E-08	7.8E-08	6.2E-08	6.1E-08	1.5E-07	6.5E-08	6.2E-08	7.1E-08
	(mrem)	1.9E-03	7.7E-06	7.8E-06	6.2E-06	6.1E-06	1.5E-05	6.5E-06	6.2E-06	7.1E-06
Ingestion	(mSv)	0.0E+00	4.1E-08	4.1E-08	4.1E-08	1.2E-06	1.8E-05	4.1E-08	1.7E-06	1.2E-06
	(mrem)	0.0E+00	4.1E-06	4.1E-06	4.1E-06	1.2E-04	1.8E-03	4.1E-06	1.7E-04	1.2E-04
Sum Total	(mSv)	1.9E-05	1.2E-07	1.2E-07	1.0E-04	1.3E-06	1.9E-05	1.1E-07	1.8E-06	1.4E-05
	(mrem)	1.9E-03	1.2E-05	1.2E-05	1.0E-02	1.3E-04	1.9E-03	1.1E-05	1.8E-04	1.4E-03

Table 4.12-5B Annual and Committed Dose Equivalents for Exposures in Year 30 to an Teen from Gaseous Effluents (Nearest Resident) Based on Initial Site Evaluation

Source		Skin	Gonads	Breast	Lung	Red Bone Marrow	Bone surface	Thyroid	Remainder	Effective Dose Equivalent
Cloud Immersion	(mSv)	2.3E-13	1.6E-13	1.9E-13	1.5E-13	1.4E-13	4.2E-13	1.6E-13	1.5E-13	1.7E-13
	(mrem)	2.3E-11	1.6E-11	1.9E-11	1.5E-11	1.4E-11	4.2E-11	1.6E-11	1.5E-11	1.7E-11
Inhalation	(mSv)	0.0E+00	1.1E-09	1.2E-09	1.2E-04	3.1E-08	4.6E-07	1.2E-09	4.4E-08	1.5E-05
	(mrem)	0.0E+00	1.1E-07	1.2E-07	1.2E-02	3.1E-06	4.6E-05	1.2E-07	4.4E-06	1.5E-03
Grd. Plane direct	(mSv)	1.9E-05	7.7E-08	7.8E-08	6.2E-08	6.1E-08	1.5E-07	6.5E-08	6.2E-08	7.1E-08
	(mrem)	1.9E-03	7.7E-06	7.8E-06	6.2E-06	6.1E-06	1.5E-05	6.5E-06	6.2E-06	7.1E-06
Ingestion	(mSv)	0.0E+00	7.1E-08	7.0E-08	7.0E-08	2.0E-06	3.1E-05	7.0E-08	3.0E-06	2.1E-06
	(mrem)	0.0E+00	7.1E-06	7.0E-06	7.0E-06	2.0E-04	3.1E-03	7.0E-06	3.0E-04	2.1E-04
Sum Total	(mSv)	1.9E-05	1.5E-07	1.5E-07	1.2E-04	2.1E-06	3.1E-05	1.4E-07	3.1E-06	1.7E-05
	(mrem)	1.9E-03	1.5E-05	1.5E-05	1.2E-02	2.1E-04	3.1E-03	1.4E-05	3.1E-04	1.7E-03

Table 4.12-5C Annual and Committed Dose Equivalents for Exposures in Year 30 to an Child from Gaseous Effluent (Nearest Resident) Based on Initial Site Evaluation

Source		Skin	Gonads	Breast	Lung	Red Bone Marrow	Bone Surface	Thyroid	Remainder	Effective Dose Equivalent
Cloud Immersion	(mSv)	2.3E-13	1.6E-13	1.9E-13	1.5E-13	1.4E-13	4.2E-13	1.6E-13	1.5E-13	1.7E-13
	(mrem)	2.3E-11	1.6E-11	1.9E-11	1.5E-11	1.4E-11	4.2E-11	1.6E-11	1.5E-11	1.7E-11
Inhalation	(mSv)	0.0E+00	8.6E-10	9.6E-10	9.5E-05	2.4E-08	3.6E-07	9.2E-10	3.4E-08	1.1E-05
	(mrem)	0.0E+00	8.6E-08	9.6E-08	9.5E-03	2.4E-06	3.6E-05	9.2E-08	3.4E-06	1.1E-03
Grd. Plane direct	(mSv)	1.9E-05	7.7E-08	7.8E-08	6.2E-08	6.1E-08	1.5E-07	6.5E-08	6.2E-08	7.1E-08
	(mrem)	1.9E-03	7.7E-06	7.8E-06	6.2E-06	6.1E-06	1.5E-05	6.5E-06	6.2E-06	7.1E-06
Ingestion	(mSv)	0.0E+00	6.8E-08	6.8E-08	6.8E-08	1.9E-06	3.0E-05	6.8E-08	2.9E-06	2.0E-06
	(mrem)	0.0E+00	6.8E-06	6.8E-06	6.8E-06	1.9E-04	3.0E-03	6.8E-06	2.9E-04	2.0E-04
Sum Total	(mSv)	1.9E-05	1.5E-07	1.5E-07	9.5E-05	2.0E-06	3.0E-05	1.3E-07	2.9E-06	1.4E-05
	(mrem)	1.9E-03	1.5E-05	1.5E-05	9.5E-03	2.0E-04	3.0E-03	1.3E-05	2.9E-04	1.4E-03

Table 4.12-5D Annual and Committed Dose Equivalents for Exposures in Year 30 to an Infant from Gaseous Effluent (Nearest Resident) Based on Initial Site Evaluation

Source		Skin	Gonads	Breast	Lung	Red Bone Marrow	Bone Surface	Thyroid	Remainder	Effective Dose Equivalent
Cloud Immersion	(mSv)	2.3E-13	1.6E-13	1.9E-13	1.5E-13	1.4E-13	4.2E-13	1.6E-13	1.5E-13	1.7E-13
	(mrem)	2.3E-11	1.6E-11	1.9E-11	1.5E-11	1.4E-11	4.2E-11	1.6E-11	1.5E-11	1.7E-11
Inhalation	(mSv)	0.0E+00	6.8E-10	7.7E-10	7.6E-05	1.9E-08	2.9E-07	7.3E-10	2.7E-08	9.1E-06
	(mrem)	0.0E+00	6.8E-08	7.7E-08	7.6E-03	1.9E-06	2.9E-05	7.3E-08	2.7E-06	9.1E-04
Grd. Plane direct	(mSv)	1.9E-05	7.7E-08	7.8E-08	6.2E-08	6.1E-08	1.5E-07	6.5E-08	6.2E-08	7.1E-08
	(mrem)	1.9E-03	7.7E-06	7.8E-06	6.2E-06	6.1E-06	1.5E-05	6.5E-06	6.2E-06	7.1E-06
Ingestion	(mSv)	0.0E+00	1.2E-08	1.2E-08	1.2E-08	3.5E-07	5.3E-06	1.2E-08	5.1E-07	3.6E-07
	(mrem)	0.0E+00	1.2E-06	1.2E-06	1.2E-06	3.5E-05	5.3E-04	1.2E-06	5.1E-05	3.6E-05
Sum Total	(mSv)	1.9E-05	9.0E-08	9.1E-08	7.6E-05	4.3E-07	5.7E-06	7.8E-08	6.0E-07	9.5E-06
	(mrem)	1.9E-03	9.0E-06	9.1E-06	7.6E-03	4.3E-05	5.7E-04	7.8E-06	6.0E-05	9.5E-04

Table 4.12-6A Annual and Committed Dose Equivalents for Exposures in Year 30 to an Adult From Gaseous Effluent (Nearby Businesses) Based on Initial Site Evaluation

Location: Nearby Business – SE, 925 m (3,035 ft)

Source		Skin	Gonads	Breast	Lung	Red Bone Marrow	Bone Surface	Thyroid	Remainder	Effective Dose Equivalent
Cloud Immersion	(mSv)	7.4E-13	5.3E-13	6.3E-13	5.0E-13	4.6E-13	1.4E-12	5.3E-13	4.7E-13	5.4E-13
	(mrem)	7.4E-11	5.3E-11	6.3E-11	5.0E-11	4.6E-11	1.4E-10	5.3E-11	4.7E-11	5.4E-11
Inhalation	(mSv)	0.0E+00	2.1E-09	2.4E-09	2.3E-04	5.8E-08	8.8E-07	2.2E-09	8.3E-08	2.8E-05
	(mrem)	0.0E+00	2.1E-07	2.4E-07	2.3E-02	5.8E-06	8.8E-05	2.2E-07	8.3E-06	2.8E-03
Grd. Plane direct	(mSv)	3.6E-05	1.5E-07	1.5E-07	1.2E-07	1.2E-07	2.8E-07	1.2E-07	1.2E-07	1.3E-07
	(mrem)	3.6E-03	1.5E-05	1.5E-05	1.2E-05	1.2E-05	2.8E-05	1.2E-05	1.2E-05	1.3E-05
Ingestion	(mSv)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
	(mrem)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Sum Total	(mSv)	3.6E-05	1.5E-07	1.5E-07	2.3E-04	1.7E-07	1.2E-06	1.3E-07	2.0E-07	2.8E-05
	(mrem)	3.6E-03	1.5E-05	1.5E-05	2.3E-02	1.7E-05	1.2E-04	1.3E-05	2.0E-05	2.8E-03

Table 4.12-6B Annual and Committed Dose Equivalents for Exposures in Year 30 to an Adult From Gaseous Effluent (Nearby Businesses) Based on Initial Site Evaluation

Location: Nearby Business – NNW, 1,712 m (5,617 ft)

Source		Skin	Gonads	Breast	Lung	Red Bone Marrow	Bone Surface	Thyroid	Remainder	Effective Dose Equivalent
Cloud Immersion	(mSv)	6.0E-13	4.3E-13	5.1E-13	4.1E-13	3.7E-13	1.1E-12	4.3E-13	3.9E-13	4.4E-13
	(mrem)	6.0E-11	4.3E-11	5.1E-11	4.1E-11	3.7E-11	1.1E-10	4.3E-11	3.9E-11	4.4E-11
Inhalation	(mSv)	0.0E+00	1.7E-09	1.9E-09	1.9E-04	4.7E-08	7.2E-07	1.8E-09	6.8E-08	2.3E-05
	(mrem)	0.0E+00	1.7E-07	1.9E-07	1.9E-02	4.7E-06	7.2E-05	1.8E-07	6.8E-06	2.3E-03
Grd. Plane direct	(mSv)	5.2E-05	2.1E-07	2.1E-07	1.7E-07	1.7E-07	4.1E-07	1.8E-07	1.7E-07	1.9E-07
	(mrem)	5.2E-03	2.1E-05	2.1E-05	1.7E-05	1.7E-05	4.1E-05	1.8E-05	1.7E-05	1.9E-05
Ingestion	(mSv)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
	(mrem)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Sum Total	(mSv)	5.2E-05	2.1E-07	2.1E-07	1.9E-04	2.1E-07	1.1E-06	1.8E-07	2.4E-07	2.3E-05
	(mrem)	5.2E-03	2.1E-05	2.1E-05	1.9E-02	2.1E-05	1.1E-04	1.8E-05	2.4E-05	2.3E-03

Table 4.12-7A Annual and Committed Dose Equivalents for Exposure in Year 30 to an Adult From Gaseous Effluent (Site Boundary) Based on Initial Site Evaluation

Location: Maximum Site Boundary – South, 417 m (1,368 ft)

Source		Skin	Gonads	Breast	Lung	Red Bone Marrow	Bone Surface	Thyroid	Remainder	Effective Dose Equivalent
Cloud Immersion	(mSv)	4.5E-12	3.2E-12	3.8E-12	3.0E-12	2.7E-12	8.3E-12	3.2E-12	2.8E-12	3.3E-12
	(mrem)	4.5E-10	3.2E-10	3.8E-10	3.0E-10	2.7E-10	8.3E-10	3.2E-10	2.8E-10	3.3E-10
Inhalation	(mSv)	0.0E+00	1.3E-08	1.4E-08	1.4E-03	3.5E-07	5.3E-06	1.3E-08	5.0E-07	1.7E-04
	(mrem)	0.0E+00	1.3E-06	1.4E-06	1.4E-01	3.5E-05	5.3E-04	1.3E-06	5.0E-05	1.7E-02
Grd. Plane direct	(mSv)	2.7E-04	1.1E-06	1.1E-06	8.8E-07	8.6E-07	2.1E-06	9.1E-07	8.7E-07	1.0E-06
	(mrem)	2.7E-02	1.1E-04	1.1E-04	8.8E-05	8.6E-05	2.1E-04	9.1E-05	8.7E-05	1.0E-04
Ingestion	(mSv)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
	(mrem)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Sum Total	(mSv)	2.7E-04	1.1E-06	1.1E-06	1.4E-03	1.2E-06	7.4E-06	9.2E-07	1.4E-06	1.7E-04
	(mrem)	2.7E-02	1.1E-04	1.1E-04	1.4E-01	1.2E-04	7.4E-04	9.2E-05	1.4E-04	1.7E-02

Table 4.12-7B Annual and Committed Dose Equivalents for Exposure in Year 30 to an Adult From Gaseous Effluent (Site Boundary) Based on Initial Site Evaluation

Location: Maximum Site Boundary – North, 995 m (3,265 ft) Side Next to UBC Storage Pad)

Source		Skin	Gonads	Breast	Lung	Red Bone Marrow	Bone Surface	Thyroid	Remainder	Effective Dose Equivalent
Cloud Immersion	(mSv)	2.3E-12	1.7E-12	2.0E-12	1.6E-12	1.4E-12	4.3E-12	1.7E-12	1.5E-12	1.7E-12
	(mrem)	2.3E-10	1.7E-10	2.0E-10	1.6E-10	1.4E-10	4.3E-10	1.7E-10	1.5E-10	1.7E-10
Inhalation	(mSv)	0.0E+00	6.5E-09	7.4E-09	7.3E-04	1.8E-07	2.8E-06	7.0E-09	2.6E-07	8.7E-05
	(mrem)	0.0E+00	6.5E-07	7.4E-07	7.3E-02	1.8E-05	2.8E-04	7.0E-07	2.6E-05	8.7E-03
Grd. Plane direct	(mSv)	2.4E-04	9.7E-07	9.8E-07	7.9E-07	7.8E-07	1.9E-06	8.2E-07	7.9E-07	9.0E-07
	(mrem)	2.4E-02	9.7E-05	9.8E-05	7.9E-05	7.8E-05	1.9E-04	8.2E-05	7.9E-05	9.0E-05
Ingestion	(mSv)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
	(mrem)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Sum Total	(mSv)	2.4E-04	9.8E-07	9.9E-07	7.3E-04	9.6E-07	4.6E-06	8.3E-07	1.0E-06	8.8E-05
	(mrem)	2.4E-02	9.8E-05	9.9E-05	7.3E-02	9.6E-05	4.6E-04	8.3E-05	1.0E-04	8.8E-03

4.12.15 Section 4.12 Figures

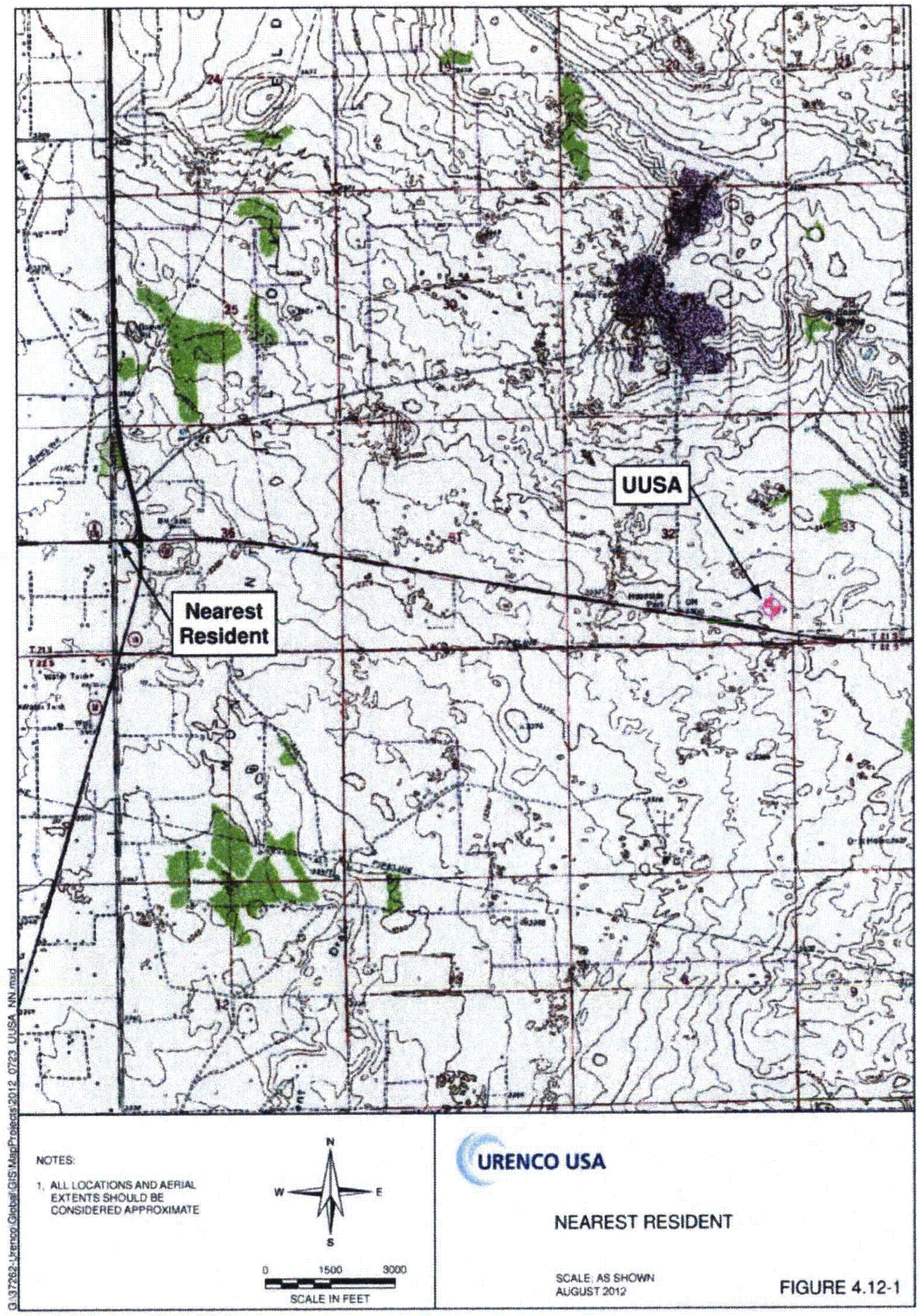

Figure 4.12-1 Nearest Resident

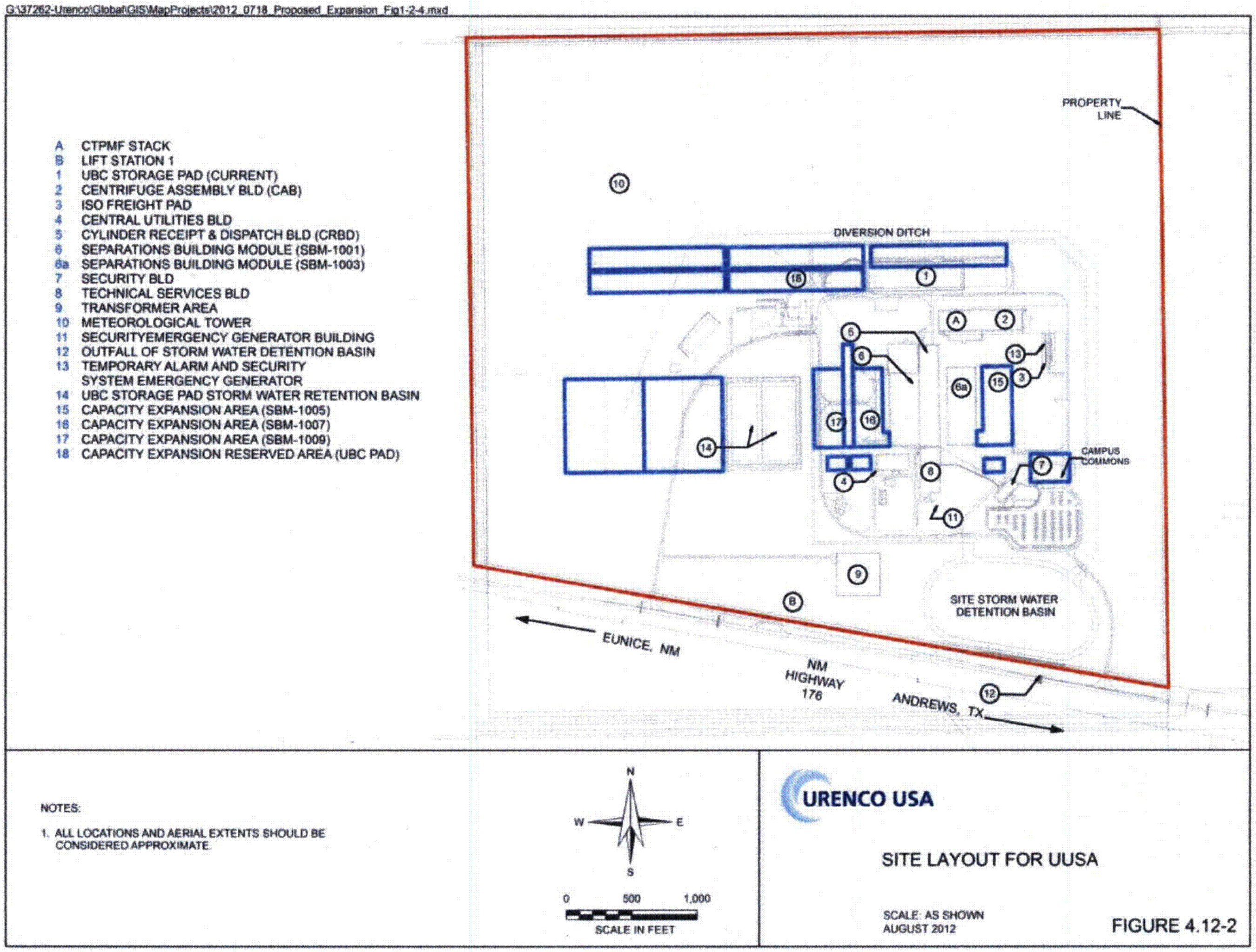

Figure 4.12-2 Site Layout for UUSA

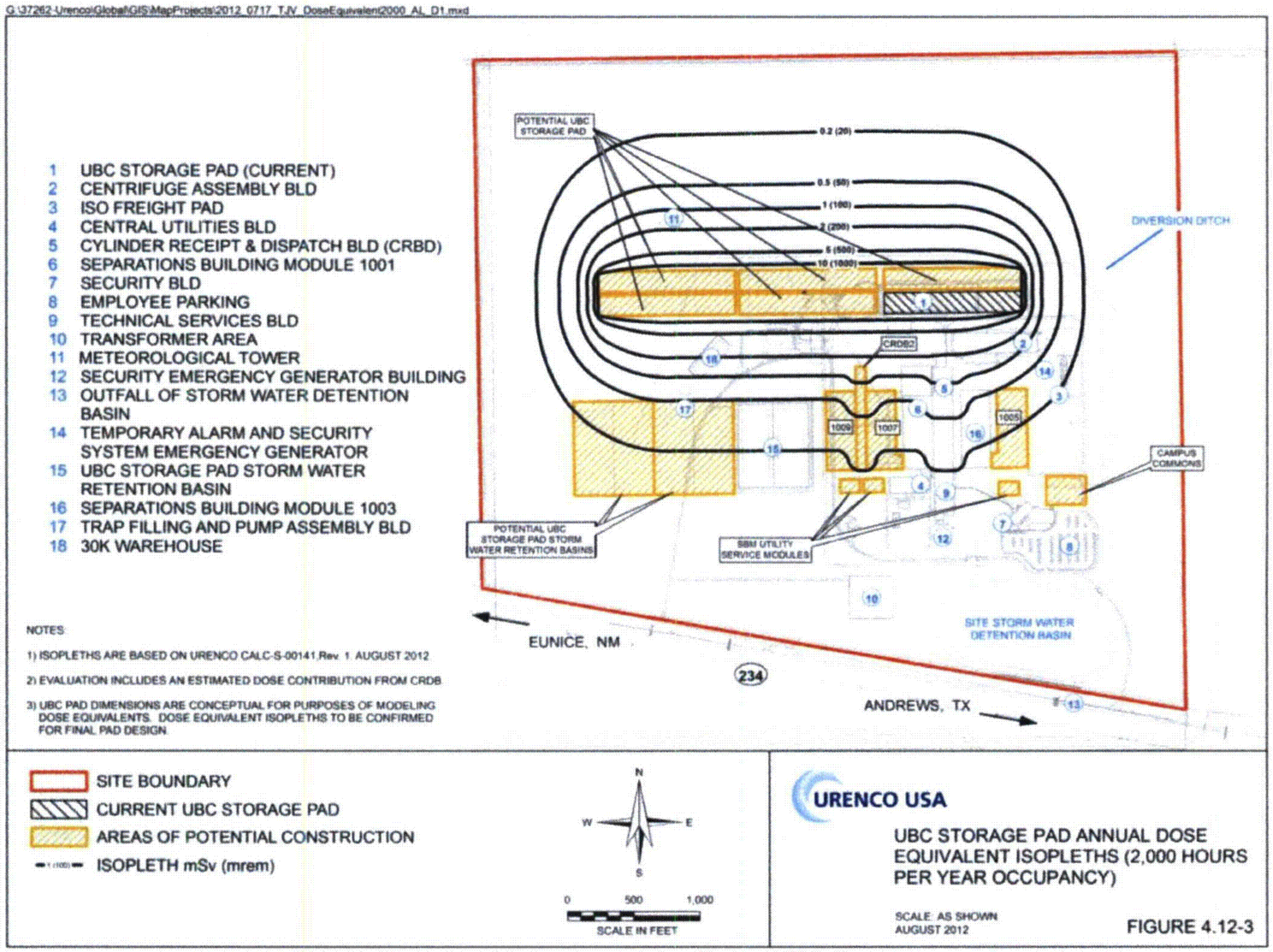

Figure 4.12-3 UBC Storage Pad Annual Dose Equivalent Isopleths (2,000 Hours per Year Occupancy)

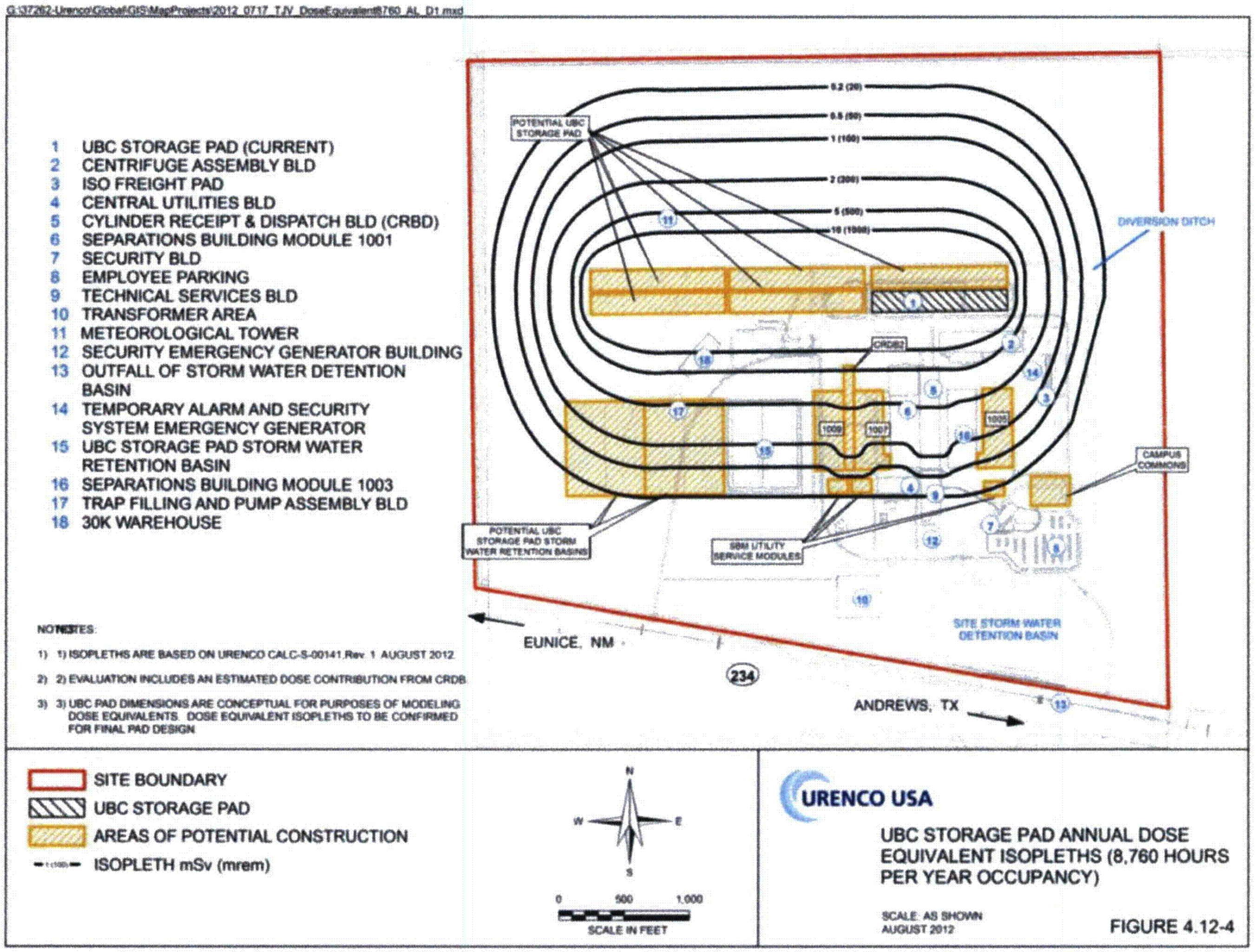

Figure 4.12-4 UBC Storage Pad Annual Dose Equivalent Isopleths (8,760 Hours per Year Occupancy)

4.13 Waste Management Impacts

4.13.1 Solid Waste

Solid waste generated at UUSA will continue to be disposed of at licensed facilities designed to accept the various waste types. The types of waste expected to be generated, the volumes and means for management of the materials through off-site disposal were previously described in LES ER Section 3.12. Increases to onsite storage of UBCs associated with the proposed facility capacity expansion will minimally impact the environment. A detailed pathway assessment for the UBC Storage Pad is provided in ER Section 4.12.6.

The additional SBMs will generate radioactive waste similar to that generated by the operating SBMs, which were previously evaluated for the nominal 3 MSWU facility (e.g., filters and filter media). These wastes will be managed consistent with current management practices for the waste currently being generated. This material will be disposed off-site as Class A low level waste potentially at facilities previously evaluated including Energy Solutions at Clive Utah or at the neighboring Waste Control Specialists (WCS), which has recently been permitted by the Texas Commission on Environmental Quality to receive this type of waste. UUSA will continue to ship all hazardous wastes off-site within the required regulatory timeframe. UUSA will not treat, store or dispose of hazardous wastes onsite; therefore the impacts for such systems are not evaluated.

It is anticipated the volumes of these Class A wastes will increase, at most proportionally, to the increase in proposed facility capacity due to the expansion. The initial EIS evaluated the impacts of annual radiological solid waste generation rates of 191,800 pounds per year. Based on the current actual rate of production of these radioactive solid wastes (shown in LES ER Tables 3.12-1 through 3.12-3), and projections in Table 4.13-1 for increased generation (i.e., ten times current annual generation rate), it appears the total annual generation of these waste materials resulting from the proposed facility capacity expansion will be significantly less than the annual waste generation rate evaluated prior to the construction of the facility (NRC EIS 2005).

The proposed facility capacity expansion impact increases for solid and radioactive waste management will be SMALL, and can be managed effectively based on the current practices and waste disposal infrastructures available to UUSA. These conclusions are based on the fact that the proposed facility capacity expansion is not anticipated to involve any changes to the characteristics or management practices for solid wastes and non-liquid radioactive wastes, and that the proposed changes in management of liquid radioactive wastes (shipment to offsite disposal as either liquid or solidified waste versus onsite treatment by evaporation) will not change the conclusion that sufficient commercial disposal capacity exists for these wastes.

4.13.1.1 Construction

The changes in impacts from waste management due to construction of the proposed facility capacity expansion would increase the time period throughout which the construction wastes are generated. Because the amount and character of waste generated annually by construction activities are not anticipated to change significantly during the proposed facility capacity expansion relative to the initial and on-going construction (only the time frame would be extended), the impact would be SMALL for construction waste management.

The time period that the construction wastes would be generated will extend due to the proposed facility capacity expansion. The construction period for the proposed facility capacity expansion would continue approximately eight (8) years beyond the initial construction period.

4.13.1.2 Operation

The changes in impacts from solid and hazardous waste management due to the operation of the expanded facility will increase by a factor less than the increased separative work unit capacity anticipated for the expansion.

The amount of solid and radioactive waste generated annually during operation of the 10 MSWU proposed facility capacity expansion would increase over the annual quantity evaluated prior to site construction.

During operations, the increase in annual office, packaging and cafeteria waste and hazardous wastes quantities would be only incrementally larger than current quantities. The total UUSA employees projected at the proposed facility expansion capacity is an insignificant increase from current levels, and although there will be more maintenance and facilities personnel, the solid and hazardous waste is not anticipated to increase in a proportional way with respect to the facility capacity.

4.13.2 Gaseous Effluents

The gaseous effluents generated by the expanded facility will increase for each of the additional Separation Building Modules (SBM) as they are brought online. The gaseous effluents are anticipated to include uranium and hydrogen fluoride vapor. The additional gaseous effluents associated with the proposed facility capacity expansion will be effectively managed, as with the current state, so that releases remain below the minimum requirements set forth in 10 CFR 20.1101d. The impacts associated with air quality are more fully addressed under section 4.6.

4.13.3 Liquid Effluents

The non-radiological liquid effluents generated and discharged by the facility (which consist solely of domestic wastewater) would not increase significantly due to proposed facility capacity expansion. This is because a limited increase in workforce is needed to implement the expanded facility operations and their projected additional use of potable water for sanitary uses and shower is not anticipated to be significantly different than the impacts previously evaluated.

The expanded UUSA facility will also continue to generate liquid radioactive wastes, including aqueous degreaser water, laboratory wastes, spent citric acid, and miscellaneous effluents. Quantities of radiologically contaminated, potentially radiologically contaminated, and non-radiologically contaminated aqueous liquid effluents are generated in a variety of operations and processes in the CRDB (Cylinder Receipt and Dispatch Building), CAB (Centrifuge Assembly Building), and in the SBMs. The majority of all potentially radiologically contaminated aqueous liquid effluents are generated in the CRDB. All aqueous liquid effluents generated in the CRDB are collected in Safe By Design (SBD) and bulk tanks that are located in the Liquid Effluent Collection and Treatment (LECTS) Room in the CRDB.

Liquid effluents produced include hydrolyzed uranium hexafluoride and aqueous laboratory effluent, degreaser water, citric acid, floor washings, miscellaneous condensates, and active area hand washings/shower water. It is anticipated these systems will continue to be available to the proportional increase in liquid radiological waste generated due to the proposed facility capacity expansion.

Table 4.13-1 indicates the current waste generation for waste streams and also projects the current annual generation rate for liquid radiological waste through the proposed phased facility capacity expansion. Generation rates have been estimated by using the operational experience at the Almelo, Netherlands facility for generation of liquid radiological waste and extrapolating the rate of generation to the proposed 10 MSWU facility capacity expansion.

As discussed in Section 3.12.9, prior to UUSA construction, liquid radiological wastes of 7,850 gallons evaporated or treated were evaluated in the LES ER. The annual generation rate expected through full construction and operation of SBM-1001 and 1003 is now projected to be larger, at approximately 28,000 gallons, because UUSA has determined that it will not use evaporation processes, including the proposed Treated Effluent Evaporative Basin discussed in the LES ER, to reduce waste volumes. Additional flow volume is also anticipated due to an increase in pump decontamination washes and emergency shower effluents. The UUSA license amendment application will reflect this revised projection.

The expansion is then projected, based on the proposed facility capacity expansion producing a proportional increase in the annual generation of liquid radiological wastes and the operational experience at the Almelo facility, to generate up to approximately 77,000 total gallons annually of liquid radiological waste. Table 4.13-1 indicates a projection of the annual generation rate for radiological wastes through the period of proposed facility capacity expansion. The volume of the solidified radioactive effluent is approximately 1.7 times the volume of the wastewater, and will have approximately 3.25 times the original weight due to the added grout.

Neither the increase in projected liquid waste quantities for the currently licensed facility nor the additional quantities expected with the expansion will have significant environmental impacts. It will not have significant transportation or public health impacts. See Sections 4.2.7, 4.12.

Additional shifts will be required to manage the projected annual liquid radiological waste due to the proposed facility capacity expansion because the UUSA collection and disposal system was constructed to have a capacity of approximately 52,800 gallons annual throughput. As the system no longer uses evaporation, no sludge is anticipated to be generated by the liquid radiological waste management.

The majority of the wastes and effluents from the facility will continue to be from auxiliary systems and activities and not from the enrichment process itself.

The evaluation conducted prior to site construction indicated that non-hazardous solid waste management impacts for operation were insignificant for the Lea County Landfill (less than 0.03% of the capacity, and accounted for in the anticipated 10% increase per year) and the amount due to proposed facility capacity expansion would be relatively minor with respect to the landfill capacity (less than 0.1% of the capacity, and accounted for in the anticipated 10% increase per year).

In the case of radiological waste, the annual generation rate is more than the rate evaluated prior to site construction. The increase is due to the facility capacity expansion and the off-site disposal of liquid radiological wastes, the majority of which will be solidified onsite prior to shipment. The impacts of disposal of these wastes were previously evaluated using evaporation as a treatment technology. Since the facility has elected to utilize offsite disposal options instead of onsite evaporation, the volume and weight of liquid radioactive waste and solidified wastewater sent to offsite disposal facilities has increased. Due to sufficient commercial waste disposal capacity the potential impact from the increased waste will continue to be SMALL. Similarly, the 20-year capacity of the nation's hazardous and low-level radioactive waste (LLW) facilities would not be significantly reduced by the anticipated increases in liquid radioactive wastes, or the solidified wastewater wastes.

Because the characteristics of the solid and hazardous wastes will not change due to the proposed facility capacity expansion and because adequate disposal capacity exists, the impacts would continue to be SMALL for solid, hazardous and radiological operational waste management.

4.13.4 Depleted UF_6

The proposed facility capacity expansion will result in increased generation of depleted UF_6. The amount of depleted UF_6 generation evaluated in the initial EIS is 8,600 tons. Based on UUSA projections for annual generation rates through the period of the proposed facility capacity expansion, the annual rate of generation will peak at 1,250 cylinders per year or slightly less than twice the quantities evaluated prior to facility construction. The amount of depleted UF_6 stored at the facility as a result of the proposed facility capacity expansion will increase from the quantity previously evaluated. The total number of UBCs stored at the facility is planned to increase from 15,727 to 25,000 cylinders in accordance with the agreement with the State of New Mexico.

- The depleted UF_6 impacts are anticipated to increase as a result of the increased number of depleted UF_6 UBCs at the Site. Results of analysis of radiation exposure pathways are used to evaluate potential impacts in Section 4.12, Public and Occupational Health Impacts.

  The potential International Isotopes Fluorine Products (IIFP) facility to be located in Lea County increases the options for depleted UF_6 processing over those that were evaluated prior to the site construction. UUSA has signed an agreement with the proposed International Isotopes Fluorine Products, Inc. (IIFP) to accept UUSA depleted UF_6 for deconversion. International Isotopes Fluorine Products, Inc. is currently in the licensing process with the NRC for constructing and operating a facility west of Hobbs, New Mexico (approximately 20 miles from the UUSA facility). Though not adjacent to UUSA, IIFP is proximal. The IIFP facility would deconvert depleted UF_6 to depleted uranium dioxide (UO_2) and fluoride. The fluoride would be produced into specialty fluoride gas products for sale and the depleted U_3O_8 that would form at ambient temperature would be disposed of as low-level waste as an absolute final option if no other use could be found for the DU. UO_2 would be disposed of as low-level waste. The proposed IIFP facility design capacity is 3.4 million kilograms depleted UF_6 per year. The waste management impacts for the IIFP depleted UF_6 deconversion were determined in the 2012 IIFP DEIS to be SMALL.

The radioactive depleted U_3O_8 waste from the deconversion process would be shipped from the deconversion facility to an offsite low-level radioactive waste (LLW) disposal facility licensed to accept depleted U_3O_8. Licensed facility potential options identified for LLW disposal include the EnergySolutions Clive, Utah facility and the WCS facility on the Texas-New Mexico border west of Andrews, Texas (immediately east of the UUSA facility) with less probable destinations being the U.S. Ecology Washington disposal facility on the Hanford Site near Richland, Washington and the Nevada National Security Site.

The anticipated volume of waste generated by the IIFP facility is up to about 2.8 million kilograms (kg) per year or 1,300 cubic meters depleted U_3O_8 generated compared to the Clive, Utah facility capacity of 3.1 million cubic meters. The NRC staff recently analyzed the potential impact of proposed IIFP depleted U_3O_8 disposal operations (which included depleted U_3O_8 deconverted from UUSA DUF_6) based on the Clive, Utah facility LLW disposal capacity in the IIFP Draft EIS and concluded the impacts would be SMALL.

4.13.5 Waste and Waste Management System Descriptions

Descriptions of the sources, types and quantities of solid, hazardous, radioactive and mixed wastes and the existing UUSA waste management systems are provided in Supplemental ER Section 3.12 and the LES ER Section 3.12.

4.13.5.1 Waste Disposal Plans

In the initial ER, UUSA was expected to produce approximately 172,500 kg (380,400 lbs) of solid waste trash annually. The increase in industrial waste generated by operation of the expanded capacity facility would be only incrementally larger than current quantities. The total UUSA employees projected at the proposed facility expansion to 10 MSWU is an insignificant increase from current levels of approximately 250, and although there will be more maintenance and facilities personnel, the industrial waste is not anticipated to increase in a proportional way with respect to the facility capacity.

4.13.5.2 Radioactive and Mixed Waste Disposal Plans

Solid radioactive wastes are produced in a number of plant activities and require a variety of methods for treatment and disposal. These wastes, as well as the generation and handling systems, are described in detail in Supplemental ER Section 3.12, Waste Management, and LES ER Section 3.12.

As described in LES ER Section 4.13.3 all radioactive and mixed wastes are disposed of at an offsite, licensed facility. The impact on the environment due to this offsite facility is not addressed in this report. LES ER Table 4.13-1, Possible Radioactive Waste Processing/Disposal Facilities, summarizes the facilities that may be used to process or dispose of UUSA radioactive or mixed waste.

Radioactive waste will be shipped to any of the four listed radioactive waste processing disposal sites. Other offsite processing or disposal facilities may be used if appropriately licensed to accept UUSA waste types. Depleted UF_6 will be shipped to one of the UF_6 Conversion Facilities subsequent to temporary onsite storage. UUSA has signed an agreement with International Isotopes Fluorine Products, Inc. (IIFP) to accept UUSA depleted UF_6 for deconversion. International Isotopes Fluorine Products, Inc. is currently in the licensing process with the NRC for constructing and operating a facility west of Hobbs, New Mexico (approximately 20 miles from the UUSA facility). Though not adjacent to UUSA, IIFP is proximal. The IIFP facility would deconvert depleted UF_6 to depleted uranium dioxide (UO_2) and fluoride. The proposed IIFP facility design capacity is 3.4 million kilograms depleted UF_6 per year.

The radioactive depleted UO_2 waste from the deconversion process would be shipped from the deconversion facility to an offsite low-level radioactive waste (LLW) disposal facility licensed to accept depleted UO_2. Licensed facility potential options identified for LLW disposal include the EnergySolutions Clive, Utah facility and the WCS facility on the Texas-New Mexico border west of Andrews, Texas (immediately east of the UUSA facility) with less probable destinations being the U.S. Ecology Washington disposal facility on the Hanford Site near Richland, Washington and the Nevada National Security Site.

The anticipated volume of waste generated by the IIFP facility is up to about 2.8 million kilograms (kg) per year or 1,300 cubic meters depleted UO_2 generated compared to the Clive, Utah facility capacity of 3.1 million cubic meters. The NRC staff recently analyzed the potential impact of proposed IIFP depleted UO_2 disposal operations (which included depleted UO_2 deconverted from UUSA DUF_6) based on the Clive, Utah facility LLW disposal capacity in the IIFP Draft EIS and concluded the impacts would be SMALL.

UUSA calculated 7.8 million kg per year depleted UF_6 production rate (8,600 tons) prior to the proposed facility capacity expansion. Based on a peak projected annual depleted UF_6 cylinder generation of 1,250 cylinders and assuming the depleted UF_6 conversion rate is similar to that expressed in the IIFP DEIS, the annual depleted UO_2 generation rate would be approximately 13,100 tons or about 5,500 cubic meters depleted UO_2 per year. Based on a capacity of 3.1 million cubic meters for the Clive, Utah facility, this annual volume would be less than 0.2% of the facility capacity. The annual volume is low compared to the facility capacity, and therefore the impacts for depleted UO_2 on disposal facilities are considered to continue to be SMALL to MODERATE.

The potential environmental impacts from direct exposure are described in ER Section 4.12.6, Direct Radiation Impacts. For the purposes of the dose calculation in that section, the UBC Storage Pad will have a capacity of 25,000 UBCs, plus a quantity of empty feed and empty clean product cylinders for a total of 28,500 containers.

4.13.6 (*See SAR § 12.2.3)* Uranium Byproduct Cylinder (UBC) Storage

UUSA yields a depleted UF_6 stream that will be temporarily stored onsite in containers before transfer to the conversion facility and subsequent reuse or disposal. The storage of these cylinders was discussed in LES ER Section 4.13.3.1.1 and the increased storage from the proposed action will follow the same procedures; however, the pad area will be expanded and the cylinders have been proposed to be arranged in a triple stack configuration. UUSA will maintain an active cylinder management program to improve storage conditions in the cylinder yard, to monitor cylinder integrity by conducting routine inspections for breaches, and to perform cylinder maintenance and repairs to cylinders and the UBC Storage Pad, as needed. The UBC Storage Pad has been sited to minimize the potential environmental impact from external radiation exposure to the public at the site boundary. The concrete pad will be expanded in size as needed to store 28,500 total cylinders in a stacked arrangement. The dose equivalent rate from the UBC Storage Pad at the site boundary will be below the regulatory limits of 10 CFR 20 and 40 CFR 190. The direct dose equivalent comes from the gamma-emitting progeny within the uranium decay chain. In addition, neutrons are produced by spontaneous fission in uranium and by the ${}^{19}_{9}F$ (alpha, n) ${}^{22}_{11}Na$ reaction. Environmental Thermoluminescent Dosimeters (TLDs) are distributed along the site boundary fence line to monitor impact due to photons (see ER Section 6.1), and ensure that the estimated dose equivalent is not exceeded. See ER Section 4.12.6 for more detailed information on the impact of external dose equivalents from UBC Storage Pad.

4.13.7 Mitigation for Depleted UF_6 Storage

For the proposed facility capacity expansion, UUSA will maintain an active cylinder management program to maintain optimum storage conditions in the cylinder yard, to monitor cylinder integrity by conducting routine inspections for breaches, and to perform cylinder maintenance and repairs to cylinders and the storage yard, as needed. The handling and storage procedures and practices previously described in LES ER Section 4.13.3.1.2 to mitigate adverse events, by either reducing the probability of an adverse event or reducing the consequence should an adverse event occur will continue to be in place through the proposed facility capacity expansion.

4.13.8 Depleted UF_6 Disposition Alternatives

UUSA is committed to the temporary storage of UBCs as described in ER Section 4.13.4, Uranium Byproduct Cylinder (UBC) Storage. The preferred option for disposition of the UBCs is private sector conversion and disposal and was previously described in LES ER Section 4.13.3.1.8.

At this time, UUSA considers only Options 1 and 2 below to represent plausible strategies for the disposition of its UBCs.

Option 1 –U.S. Private Sector Conversion and Disposal (Preferred Plausible Strategy)

Transporting depleted UF_6 from UUSA to a private sector conversion or deconversion facility and byproduct disposal at a licensed commercial disposal facility is the preferred "plausible strategy" disposition option. UUSA has committed to the Governor of New Mexico (LES, 2003b) that: (1) there will be no long-term disposal or long-term storage (beyond the life of the plant) of UBCs in the State of New Mexico; (2) a disposal path outside the State of New Mexico is utilized as soon as possible; (3) UUSA will aggressively pursue economically viable paths for UBCs as soon as they become available; (4) UUSA will work with qualified vendors pursuing construction of private deconversion facilities by entering in good faith discussions to provide such vendor long-term UBC contracts to assist them in their financing efforts; and (5) UUSA will put in place a financial surety bonding mechanism that assures funding will be available in the event of any default by UUSA.

UUSA has recently signed an agreement with International Isotopes Fluorine Products, Inc. (IIFP) to accept UUSA depleted UF_6 for deconversion. International Isotopes Fluorine Products, Inc. is currently in the licensing process with the NRC for constructing and operating a facility west of Hobbs, New Mexico (approximately 20 miles from the UUSA facility). Though not adjacent to UUSA as evaluated in the EIS, IIFP is proximal. The IIFP facility would deconvert depleted UF_6 to depleted uranium dioxide (UO_2) and fluoride. The fluoride would be produced into specialty fluoride gas products for sale and the depleted UO_2 would be disposed of as low-level waste. The proposed IIFP facility design capacity is 3.4 million kilograms depleted UF_6 per year.

Option 2 – DOE Conversion and Disposal (Plausible Strategy)

Transporting depleted UF_6 from UUSA to DOE conversion facilities for ultimate disposition is a plausible strategy. Pursuant to Section 3113 of the USEC Privatization Act, DOE is instructed to "accept for disposal" depleted UF_6, such as those that are generated by the NRC-licensed UUSA. To that end, DOE has constructed and contracted for the operation of two UF_6 conversion facilities located in Paducah, Kentucky and Portsmouth, Ohio. The Energy Department awarded a five-year contract for operations of the Depleted Uranium Hexaflouride facilities at both the Piketon site and one in Paducah, Ky. The contract was awarded to Babcock & Wilcox Conversion Services, of Lynchburg, Va. Under the terms of the contract, B&W will oversee the conversion of 700,000 metric ton inventory of DUF_6 to a stable chemical form that can be disposed of or re-used.

UUSA considers that given the NRC's earlier acceptance of this option, DOE's current acceptance, and DOE's existing contractual commitment to ensure operation of two depleted UF_6 conversion plants, the option to disposition its depleted UF_6 by way of DOE conversion and disposal remains plausible.

4.13.9 Water Quality Limits

All facility plant waste water effluents are contained on the UUSA site except sanitary waste and liquid radioactive wastes, which are solidified for offsite disposal. The LECTs system collects and manages the potentially impacted process waste water effluents. Sanitary wastewater is sent to the City of Eunice Wastewater Treatment Plant.

4.13.10 Waste Minimization

A high priority has been assigned to minimizing the generation of waste through reduction, reuse or recycling. UUSA will continue to incorporate several waste minimization systems in its operational procedures as previously described in LES ER Section 4.13.10. UUSA is designed to minimize the usage of natural and depletable resources. The proposed facility capacity expansion will utilize closed loop chillers for cooling purposes. Power usage will be minimized by efficient design of lighting systems, selection of high-efficiency motors, and use of proper insulation materials.

4.13.11 Control and Conservation

The features and systems described in LES ER Section 4.13.11 serve to limit, collect, confine, and treat wastes and effluents that result from the UF_6 enrichment process.

4.13.12 Reprocessing and Recovery Systems

Systems used to allow recovery, or reuse of materials, are described in LES ER Section 4.13.12.

4.13.13 Waste Cumulative Effects

The recent approval of the WCS facility for low level radioactive waste disposal will have cumulative impact on waste management resources as this facility and will provide an additional outlet and capacity for the low level waste generated at UUSA. The additional capacity of the WCS improves the ability of UUSA to access disposal facilities for their wastes.

The location of a deconversion facility (IIFP) to potentially manage depleted UF6 generated by the UUSA operation will have a cumulative impact with the UUSA proposed action. The additional depleted UF6 generated during the operation of the proposed expanded facility capacity to 10 MSWU may be processed at the IIFP, providing additional deconversion capacity and located a shorter transportation distance from the UUSA.

At the IIFP approximately 87,000 kg (191,800 lbs) of radiological and mixed waste would be generated annually, of which approximately 50 kg (110 lbs) would be mixed waste. When added to the wastes from other waste generators, such as the UUSA facility, the NRC staff found that the impacts and cumulative impacts of disposal of hazardous and solid (nonhazardous) wastes from preconstruction activities of the proposed IIFP facility would be small. Solid waste from

UUSA would be disposed of at the Lea County Landfill along with waste from the proposed IIFP facility. The solid waste generated by UUSA operating at a capacity of 10 MSWU would potentially increase the volume of wastes received at the landfill. That increase in combination with the highest IIFP annual solid waste generation rate (during Phase 1 and Phase 2 operations) would result in less than 0.1 percent change in the waste received by the Lea County Landfill. Hazardous waste generated by UUSA (less than 1, 814 kg [2 tons] per year) and the proposed IIFP facility (up to 154 tons/yr during Phase 1 operations) represents less than 0.02 percent of the hazardous waste managed in the state of New Mexico (more than 1 million tons in 2009). The NRC staff found that the combined impacts of managing the solid and hazardous wastes generated by the IIFP and the current 3MSWU capacity UUSA facilities on the available waste disposal capacity would be small. Due to the minimal increase in waste generation at UUSA as a result of the proposed action, the cumulative impact of these operations would continue to be small.

The cumulative LLW generation rate during combined Phase 1 and 2 operations would be about three times higher than from Phase 1 alone. Most of that increase would result from tripling the production of DUO2. The generation rate of other LLW streams (e.g., trash, waste drums and pallets) would also increase with the expanded Phase 2 facility. DUO2 and other radiological waste would be shipped offsite to licensed disposal facilities. Up to 9,168,009 kg (10,106 tons) per year of LLW could be sent for disposal each year. Most of the estimated annual LLW generation (approximately 99 percent) would be the DUO2 produced by the deconversion process. Assuming 450 kg (1,000 lbs) per oxide drum, Phase 1 and 2 operations would result in 8,700 to 20,000 drums of material being sent for disposal. This uranium oxide waste volume represents 3.1 percent to 7.2 percent of the annual commercial waste volume currently received at the EnergySolutions facility in Clive, Utah (NRC, 2010). The Clive facility accepts the majority of the United States' Class A waste and is estimated to have capacity to accept this waste at current volume levels for more than 20 years (GAO, 2004). The NRC staff found that the estimated generation of depleted uranium oxide and other LLW from the Phase 2 deconversion process would result in small impacts to LLW disposal capacity. The wastes generated during cumulative Phase 1 and 2 operations would be transferred offsite to licensed waste facilities with adequate disposal capacity for the estimated volumes. Thus, the NRC staff found during development of the IIFP EIS that the waste management impacts from cumulative operations of IIFP and the 3.0 MSWU UUSA would be small. The volume of LLW from the proposed action at UUSA will increase predominantly due to the solidification of previously evaluated liquid wastes. The cumulative impact of the increased UUSA generation with the new generation by the IIFP will continue to be small as there will be additional capacity for this waste at the WCS facility.

4.13.14 Comparative Waste Management Impacts of No Action Alternative Scenarios

ER Chapter 2, Alternatives, provides a discussion of possible alternatives to the capacity expansion construction and operation of UUSA, including an alternative of "no action," i.e., not expanding the current capacity. The following information provides comparative conclusions specific to the concerns addressed in this subsection for each of the three "no action" alternative scenarios addressed in ER Section 2.4, Table 2.4-2, Comparison of Environmental Impacts for the Proposed Action and the No-Action Alternative Scenarios.

Alternative Scenario B – No UUSA capacity expansion and no additional enrichment capacity is constructed by others. No additional waste impacts at the UUSA site or at otherpotential sites.

Alternative Scenario C – No UUSA capacity expansion, facility operates at 3.0 M SWU. Additional enrichment capacity is supplied by a combination of the construction and operation of

Eagle Rock in Idaho Falls, ID (proposed capacity 3.0 MSWU) and GLE in Wilmington, NC (proposed capacity 6 M SWU). The waste impact may be increased due to construction and operation at two additional sites. The waste impacts for these two additional projects are evaluated in the individual environmental impact statements for the projects.

Alternative Scenario D – No UUSA capacity expansion, facility operates at 3.0 MSWU. ; Additional enrichment capacity is supplied by a combination of the construction and operation of Eagle Rock in Idaho Falls, ID (proposed capacity 3.0 MSWU), GLE in Wilmington, NC (proposed capacity 6 M SWU), and ACP in Piketon, OH (planned capacity 3.8 M SWU). The waste impact may be increased due to construction and operation at three additional sites. The waste impacts for these three additional projects are evaluated in the individual environmental impact statements for the projects.

4.13.15 Section 4.13 Tables

Table 4.13-1 Projected Annual Radiological Waste Generation by Proposed Phased Facility Capacity Expansion

Radiological Waste	Projection (lbs)				
	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
Activated carbon	343	796	1,248	1,700	2,151
Activated alumina	2,471	5,727	8,978	12,229	15,479
Assorted paper, rubber & cloth materials	2,402	5,569	8,729	11,890	15,050
Ventilation filters	35,160	81,471	127,711	173,951	220,192
Liquid Radiological Waste	12,500	23,500	36,200	48,200	64,300
Solidified Waste Water	368,400	689,000	1,059,800	1,410,900	1,881,200

Basis of estimated quantities is a proportional increase from the amounts cited in the License Based Documents associated with a 3.0 MSWU facility capacity. These quantities do not include waste volumes that may be generated during construction or decommissioning.

Table 4.13-2 Typical Quantities of Commodities Used, Consumed, or Stored at UUSA During Construction (10.0 MSWU facility)

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 4.13-3 Typical Quantities of Commodities Used, Consumed, or Stored at UUSA During Operation (10.0 MSWU facility)

Item	Quantity	Comments
Electrical Power	17 MVA	Separation Plant
Diesel Fuel	69,803 L (18,440 gal)	Quantity reflects the fuel to be stored onsite for the Diesel Fire Water Pump, CUB Diesel Generators, and the Security Diesel Generator.
Silicon Oil	50 L (13.2 gal)	--
Corrosion Inhibitor	8,000 kg (17,637 lb)	Contracted work on cooling water systems: consumed, not stored onsite
Growth Inhibitor	1,800 kg (3,968 lb)	Contracted work on cooling water systems: consumed, not stored onsite
pH Stabilizer(sulfuric acid)	7000 kg (15400 lb)	Contracted work on cooling water systems: consumed, not stored onsite

4.14 Pre-Construction and Construction-at-Risk Activities

4.14.1 Pre-Construction Activities

As noted in Section 1.3.5, Pre-Construction Activities, certain site preparation and other pre-construction activities will be performed for SBM-1005 to support the facility capacity expansion. These activities do not fall within the definition of construction under 10 CFR 70.4. Because the capacity expansion is for an existing operating facility, these pre-construction activities are expected to be limited in nature and take place on disturbed areas. The principal pre-construction activities for SBM-1005 will include the following:

- Begin Site Preparation and Civil Construction - QL-3 Work
- Initiate procurement of QL-1 rebar
- Initiate procurement of QL-1 and Q-3 structural steel
- Initiate procurement of Core/Non-Core Equipment – IROFS

In general, there will be minimal additional disturbance to the existing site features at the project site associated with the pre-construction activities to support the facility capacity expansion. Site disturbance associated with clearing and earthmoving activities is anticipated to be limited to the previously disturbed 394 acres. Excavated soils associated with necessary construction ground improvements will continue to be stockpiled on site to the northeast portion of the property. Site property outside the disturbed plant area will generally be left in its preconstruction condition or improved through stabilization as needed.

An existing construction access roadway off of New Mexico Highway 176 will be used to support the expansion, including the planned site preparation and other pre-construction activities. The materials delivery construction access road runs north off of New Mexico Highway 176 along the west side of the UUSA site. No additional access roads will be required to support the expansion of the proposed facility capacity, including pre-construction activities, and therefore, impacts due to access road construction will be negligible.

In addition, the planned site preparation and other pre-construction activities will not require the installation of additional water and electrical utility lines. Existing potable and sewer water connections exist to support the proposed facility capacity expansion.

Accordingly, the impacts from pre-construction activities will be negligible and are bounded by the impact analysis herein.

4.14.2 Construction-At-Risk Activities

As noted in Section 1.3.6, Construction-at-Risk Activities Subject to Notification, UUSA plans to commence certain limited construction activities at its own risk for SBM-1005 prior to completion of the NRC Staff's review of the license amendment associated with the facility capacity expansion. The Phase III construction-at-risk activities for SBM-1005 will include the following:

- Begin foundation construction (QL-1)
- Begin erection of structural steel (QL-1)
- Complete weather-tight UF_6 area and Assay Unit 1005

The environmental impacts related to the construction-at-risk work for SBM-1005 were previously evaluated in the 2005 EIS when the facility was designed to consist of three SBM buildings each housing two cascade halls. NUREG-1790, at Section 2.1. The 2005 EIS found that construction impacts were SMALL with the exception of transportation impacts during construction, which were found to be SMALL to MODERATE. For a summary of the impact analysis, see NUREG-1790, at xxiv – xxvii and Table 2-9. The environmental impacts relating to construction-at-risk activities for SBM-1005 will not be significantly different from the impacts documented in the 2005 EIS.

Accordingly, the impacts from the construction-at-risk activities will be small to moderate, and are bounded by the impact analysis herein.

4.15 Summary of Environmental Impacts for the 10 MSWU Facility

Current operational metrics are provided in Section 1.2 Current Operational Information and Status.

4.15.1 Land Use

Land use impact has been characterized in ER Section 4.1, Land Use Impacts. No substantive impacts exist as related to the following:

- Land-use impact, and impact of any related Federal action that may have cumulatively significant impacts
- Area and location of land that will be disturbed on either a long-term or short-term basis.

Minor impacts related to erosion control on the site may occur, but are short-term and limited. Mitigation measures associated with these impacts are listed in ER Section 5.2.1, Land Use.

4.15.2 Transportation

Transportation impact has been characterized in ER Section 4.2, Transportation Impacts.

With respect to construction-related transportation, no substantive impacts exist as related to the following:

- Construction of the access roads to the facility. Existing access roads are available to support the ongoing construction at the site through installation of the final UBC Drainage Basins, which will require minor relocation of the existing access road.
- Transportation route and mode for conveying construction material to the facility
- Traffic pattern impacts (e.g., from any increase in traffic from heavy haul vehicles and construction worker commuting)
- Impacts of construction transportation such as fugitive dust, scenic quality, and noise.

Minor impacts related to construction traffic such as fugitive dust, noise, and emissions are discussed ER Section 4.2.4, Construction Transportation Impacts. Additional information on noise impacts is contained in ER Section 4.7.1, Predicted Noise Levels. Mitigation measures associated with transportation impacts are listed in ER Section 4.2.5, Transportation.

With respect to the transport of radioactive materials, no substantive impacts exist as related to the following activities:

- Transportation mode (i.e., truck), and routes from originating site to the destination
- Estimated transportation distance from the originating site to the destination
- Treatment and packaging procedure for radioactive wastes
- Radiological dose equivalents for incident-free scenarios to public and workers
- Impacts of operating transportation vehicles on the environment (e.g., fire from equipment sparking).

Impacts related to the transport of radioactive material are addressed in NUREG-1790 and ER Section 4.2.6, Radioactive Material Transportation. The materials that will be transported to and from the UUSA are well within the scope of the environmental impacts previously evaluated by the NRC. Because these impacts have been addressed in a previous NRC environmental impact statement (NUREG/CR-0170) (NRC, 1977a), no additional mitigation measures are proposed.

4.15.3 Geology and Soils

The potential impacts to the geology and soils have been characterized in NUREG 1790 and ER Section 4.3, Geology and Soils Impact. No substantive impacts exist as related to the following activities:

- Soil resuspension, erosion, and disruption of natural drainage
- Excavations to be conducted during construction of facility capacity expansion.

Impacts to geology and soils will be limited to surface runoff due to routine operation. Construction activities may cause some short-term increases in soil erosion at the site. Mitigation measures associated with these impacts are listed in NUREG 1790 and LES ER Section 5.2.3, Geology and Soils.

4.15.4 Water Resources

The potential impacts to the water resources have been characterized in NUREG 1790 and ER Section 4.4, Water Resources Impacts. No substantive impacts exists as related to the following:

- Impacts on surface water and groundwater quality
- Impacts of consumptive water uses (e.g., groundwater depletion) on other water users and adverse impacts on surface-oriented water users resulting from facility activities. Site groundwater will not be utilized for any reason, and therefore, should not be impacted by routine operations. UUSA water supply will be obtained from the town of Eunice, New Mexico. Current capacity for the Eunice municipal water supply system is 16,350 m^3/day (4.32 million gpd), respectively and current estimated usage is less than that from the initial ER. The usage rates listed in Section 3.4 are well within the capacity of the water system. The needs of the UUSA facility have been met by the municipal water system and as usage rates are not anticipated to increase significantly with the capacity expansion, impacts to water resources on site and in the vicinity of NEF are expected to be negligible.
- .Hydrological system alterations or impacts
- Withdrawals and returns of ground and surface water
- Cumulative effects on water resources.

UUSA will not obtain any water from onsite surface or groundwater resources. Process effluents will be solidified and disposed of off-site. Sanitary waste water will be sent to the City of Eunice Wastewater Treatment Plant for processing via a system of lift stations and 8-inch sewage lines. Stormwater from developed portions of the site will be collected in retention/detention basins, as described in ER Section 3.4, Water Resources. These include the Site Stormwater Detention Basin and the UBC Storage Pad Stormwater Retention Basins. Minor impacts to water resources are discussed in ER Section 4.4. Mitigation measures associated with these impacts are listed in ER Section 5.2, Water Resources.

4.15.5 Ecological Resources

The potential impacts to the ecological resources have been characterized in ER Section 4.5, Ecological Resources Impacts. No substantive impacts exist as related to the following:

- Total area of land to be disturbed
- Area of disturbance for each habitat type
- Use of chemical herbicides, roadway maintenance, and mechanical clearing
- Areas to be used on a short-term basis during construction
- Communities or habitats that have been defined as rare or unique or that support threatened and endangered species
- Impacts of elevated construction equipment or structures on species (e.g., bird collisions, nesting areas)
- Impact on important biota.

Impacts to ecological resources will be minimal. Mitigation measures associated with these impacts are listed in ER Section 5.3, Ecological Resources.

4.15.6 Air Quality

The potential impacts to the air quality have been characterized in ER Section 4.6, Air Quality Impacts. No substantive impacts exist as related to the following activities:

- Gaseous effluents
- Visibility impacts.

Impacts to air quality will continue to be minimal through the construction and operation of the proposed facility capacity expansion. Ongoing construction activities, including construction of the expansion, will continue to result in interim increases in hydrocarbons and particulate matter due to vehicle emissions and dust. Impacts due to plant operation consist of cooling tower plumes, small quantities of volatile organic components (VOC) emissions and trace amounts of HF, UO_2F_2, and other uranic compound effluents remaining in treated air emissions from plant ventilation systems. These effluents are significantly below regulatory limits. Mitigation measures associated with air quality impacts are listed in ER Section 5.4, Air Quality.

4.15.7 Noise

The potential impacts related to noise generated by the capacity expansion at the facility have been characterized in ER Section 4.7, Noise Impacts. No substantive impacts exists as related to the following activities:

- Predicted typical noise levels at facility perimeter
- Impacts to sensitive receptors (i.e., hospitals, schools, residences, wildlife).

During the construction of the proposed expansion, noise levels are likely to be as high as they are during the current construction. This level does not cause significant impact to nearby residents. The nearest residence is 4.3 km (2.63 mi) from the site. Mitigation measures associated with noise impacts are listed in LES ER Section 5.2.7, Noise.

4.15.8 Historical and Cultural Resources

The potential impacts to historical and cultural resources have been characterized in ER Section 4.8, Historical and Cultural Resources Impacts. Only minor impacts exist as related to the following activities:

- Construction, operation, or decommissioning
- Impact on historic properties
- Potential for human remains to be present in the project area
- Impact on archeological resources.

Impacts to Historical and Cultural Resources will be minimal. Discussions in 2012 with the NM SHPO confirmed mitigation of previously identified sites and that no further action would be required in light of proposed ongoing construction for the facility capacity expansion. Mitigation measures associated with these impacts, if required, are listed in LES ER Section 5.2.8, Historical and Cultural Resources.

4.15.9 Visual/Scenic Resources

The potential impacts to visual/scenic resources from the expansion have been characterized in ER Section 4.9, Visual/Scenic Resources Impacts. No substantive negative impacts exists as related to the following:

- The aesthetic and scenic quality of the site
- Impacts from physical structures
- Impacts on historical, archaeological or cultural properties of the site
- Impacts on the character of the site setting.

Mitigation measures associated with these impacts are listed in LES ER Section 5.2.9, Visual/Scenic Resources.

4.15.10 Socioeconomic

The potential socioeconomic impacts to the community have been characterized in ER Section 4.10, Socioeconomic Impacts. No substantive negative impacts exist as related to the following:

- Impacts to population characteristics (e.g., ethnic groups, and population density)
- Impacts to housing, health and social services, or educational and transportation resources
- Impacts to area's tax structure and distribution.

The anticipated socioeconomic impacts and cumulative socioeconomic impacts of the proposed expansion of UUSA are expected to be unchanged from current levels. See ER Section 4.10, Socioeconomic Impacts, for a detailed discussion on socioeconomic impacts.

4.15.11 Environmental Justice

The potential impacts with respect to environmental justice have been characterized in ER Section 4.11, Environmental Justice. No substantive impacts exist as related to the following:

- Disproportionate impact to minority or low-income population.

Based on the data analyzed and the NUREG-1748 guidance by which that analysis was conducted, UUSA determined that no further evaluation of potential Environmental Justice concerns was necessary, as no Census Block Group within the 6.4-km (4-mi) radius, i.e., 128 km^2 (50 mi^2), of the UUSA site contained a minority or low-income population exceeding the NUREG-1748 "20%" or "50%" criteria. See ER Section 4.11, Environmental Justice.

4.15.12 Public and Occupational Health

This section describes public and occupational health impacts from both nonradiological and radiological sources.

4.15.12.1 Nonradiological – Normal Operations

The potential impacts to public and occupational health for nonradiological sources have been characterized in ER Section 4.12.1, Nonradiological Impacts. No substantive impacts exist as related to the following:

- Impact to members of the public from nonradiological discharge of liquid or gaseous effluents to water or air
- Impact to facility workers as a result of occupational exposure to nonradiological chemicals, effluents, and wastes
- Cumulative impacts to public and occupational health.

Impacts to the public and workers from nonradiological gaseous and liquid effluents will be minimal. Mitigation measures associated with these impacts are listed in ER Section 5.5, Nonradiological – Normal Operations.

4.15.12.2 Radiological – Normal Operations

This subsection describes public and occupational health impacts from radiological sources. It provides a brief description of the methods used to assess the pathways for exposure and the potential impacts.

4.15.12.2.1Pathway Assessment

The potential for exposure to radiological sources included an assessment of pathways that could convey radioactive material to members of the public. These are briefly summarized below.

Potential points or areas were characterized to identify:

- Nearest site boundary
- Nearest full time resident
- Location of average member of the critical group
- In addition, important ingestion pathways such as stored and fresh vegetables, milk and meat, assumed to be grown or raised at the nearest resident location have been analyzed.

4.15.12.2.2Public and Occupational Exposure

The potential impacts to public and occupational health for radiological sources have been characterized in ER Section 4.12, Public and Occupational Health Impacts. No substantive impacts exist as related to the following:

- Impacts based on the average annual concentration of radioactive and hazardous materials in gaseous and liquid effluents
- Impacts to the public (as determined by the critical group)
- Impacts to the workforce based on radiological and chemical exposures
- Impacts based on reasonably foreseeable (i.e., credible) accidents with the potential to result in environmental releases.

Routine operations at UUSA create the potential for radiological and nonradiological public and occupational exposure. Radiation exposure is due to the plant's use of the isotopes or uranium and the presence of associated decay products. Chemical and radiological exposures are primarily from byproducts of UF_6; UO_2F_2, HF and related uranic compounds, that will form inside plant equipment and from reaction with components. These are the primary products of concern in gaseous effluents that will be released from the plant and liquid effluents that will be released to the onsite retention basin. Mitigation measures associated with these impacts are listed in LES ER Section 5.2.12, Public and Occupational Health.

4.15.12.3 Accidental Releases

All credible accident sequences were considered during the Integrated Safety Analysis (ISA) performed for the facility. Accidents evaluated fell into two general types: criticality events and UF_6 releases. Criticality events and some UF_6 release scenarios were shown to result in potential radiological and HF chemical exposures, respectively, to the public. Gaseous releases of UF_6 react quickly with moisture in the air to form HF and UO_2F_2. Consequence analyses showed that HF was the bounding consequence for all gaseous UF_6 releases to the environment. For some fire cases, uranic material in waste form or in chemical traps provided the bounding case. Accidents that produced unacceptable consequences to the public resulted in the identification of various design bases, design features, and administrative controls.

During the ISA process, evaluation of most accident sequences resulted in identification of design bases and design features that prevent a criticality event or HF release to the environment. LES ER Table 4.12-15, Accident Criteria Chemical Exposure Limits by Category, lists the accident criteria chemical exposure limits (HF) by category for an immediate consequence and high consequence categories.

Several accident sequences involving HF releases to the environment due to seismic or fire events were mitigated using design features to delay and reduce the UF_6 releases inside the buildings from reaching the outside environment. The seismic accident scenario considers an earthquake event of sufficient magnitude to fail portions of the UF_6 process piping and some UF_6 components resulting in a gaseous UF_6 release inside the buildings housing UF_6 process systems. The fire accident scenario considers a fire within the Cylinder Receipt and Dispatch Building (CRDB) that causes the release of uranic material from open waste containers and chemical traps during waste drum filling operations.

Potential adverse impacts for accident conditions are described in ER Section 4.12.10, Environmental Effects of Accidents. Mitigation measures associated with these impacts are listed in LES ER Section 5.2.12.3, Accidental Releases.

4.15.13 Waste Management

The potential impacts of waste generation and waste management have been characterized in ER Section 4.13, Waste Management Impacts. No substantive impacts exist as related to the following:

- Impact to the public due to the composition and disposal of solid, hazardous, radioactive and mixed wastes
- Impact to facility workers due to storage, processing, handling, and disposal of solid, hazardous, radioactive and mixed wastes
- Cumulative impacts of waste management.

Waste generated at UUSA will be comprised of industrial (nonhazardous), radioactive and mixed, and hazardous waste categories. In addition, radioactive and mixed waste will be further segregated according to the quantity of liquid that is not readily separable from the solid material. Gaseous and liquid effluent impacts are discussed in ER Section 4.12. Uranium Byproduct Cylinders (UBCs) are stored onsite at an outdoor storage area and will minimally impact the environment. See ER Section 4.13, Waste Management.

Mitigation measures associated with waste management are listed in ER Section 5.6, Waste Management.

4.15.14 Conclusion

In conclusion, analysis of the potential environmental impacts associated with the ongoing construction and operation of UUSA at a final facility capacity of 10 MSWU indicates that adverse impacts are small and are outweighed by the substantial socioeconomic benefits associated with additional plant construction and operation. Additionally, the UUSA expanded capacity will meet the underlying need for additional reliable and economical uranium enrichment capacity in the United States, thereby serving important energy and national security policy objectives. Accordingly, because the impacts of the proposed UUSA facility capacity expansion are minimal and acceptable, and the benefits are desirable, the no-action alternative may be rejected in favor of the proposed action. Significantly, UUSA has also completed a safety analysis of the proposed action supporting the associated license amendment request, in which demonstrates that the UUSA facility capacity expansion operation will be conducted in a safe and acceptable manner.

5 MITIGATION MEASURES

This chapter supplements the discussion of mitigation measures in Section 5.2 of the LES ER. UUSA is already performing the mitigation measures outlined in Section 5.2 of the LES ER at the UUSA site in order to reduce the adverse impacts that may result from the construction and operation of the UUSA facility. This chapter discusses only additional or updated mitigation measures. Where the mitigation measures have not changed since the LES ER, they are not discussed.

5.1 Land Use

The current area of disturbance on the UUSA site is approximately 394 acres of the total 543 acres for the property.

Land use mitigation measures employed during expansion-related construction by UUSA will not change as a result of the proposed facility capacity expansion with respect to the procedures and methods used at the UUSA site for earth leveling, revegetation, landscaping, cleanup and disposal of debris, erosion control structures, land management practices and stabilization of spoil piles. During construction of existing buildings SBM-1001 and SBM-1003, native soils were excavated from the footprint of the building (approximately 9,000 cubic yards per building) and moved to the northern portion of the site. The excavated soil was replaced with fill imported from the Wallach site, which is adjacent to the UUSA property to the North. The volume of imported backfill was approximately 48,000 cubic yards per building and it was compacted to provide suitable ground for the building and proposed activities. It is anticipated a similar amount of excavation and backfill will be required for construction of the other proposed buildings (SBM-1005, 1007, and 1009) and that the source will continue to be the Wallach facility across non-public roadways.

5.2 Water Resources

Mitigation measures are in place to minimize potential impacts on water resources. As discussed in LES ER Section 4.4.7, Control of Impacts to Water Quality, there is little potential to impact any groundwater or surface water resources. These mitigation measures prevent soil contamination, and include employing best management practices (BMPs) and the control of hazardous materials and fuels. In addition, the following controls have also been implemented:

- Construction equipment will be in good repair without visible leaks of oil, greases, or hydraulic fluids.
- Use of BMPs during construction and operations to prevent fuel oil spills and/or releases.
- Use of the BMPs will assure stormwater runoff related to these activities will not release runoff into nearby sensitive areas.
- BMPs will also be used for dust control associated with excavation and fill operations during construction.
- Silt fencing and/or sediment traps.
- External vehicle washing (water only and controlled to minimize use).
- Stone construction pads will be placed at entrance/exits if unpaved construction access adjoins a state road.
- All basins are arranged to provide for the prompt, systematic sampling of runoff in the event of any special needs.

- Water quality impacts will be controlled during construction by compliance with the National Pollution Discharge Elimination System – Construction General Permit requirements and by applying BMPs as detailed in the site Stormwater Pollution Prevention Plan (SWPPP).
- BMPs will be implemented for the facility to identify potential spill substances, sources and responsibilities.
- All above ground diesel storage tanks will be bermed.
- Any hazardous materials will be handled by approved methods and shipped offsite to approved disposal sites. Sanitary wastes generated during site construction will be sent to the City of Eunice Wastewater Treatment Plant for processing via a system of lift stations and 8-inch sewage lines.
- The facility's Liquid Effluent Collection and Treatment System provides a means to control liquid waste within the plant including the collection, analysis, and processing of liquid wastes for disposal.
- Liquid effluent will be solidified on site by a vendor and then disposed of off-site.
- Control of surface water runoff will be required for activities regulated by the New Mexico Environment Department. As a result, no impacts are expected to surface or groundwater bodies.

UUSA is designed to minimize the usage of natural and depletable resources as shown by the following measures:

- The use of low-water consumption landscaping versus conventional landscaping reduces water usage.
- The installation of low flow toilets, sinks and showers reduces water usage when compared to standard flow fixtures.
- Localized floor washing using mops and self-contained cleaning machines reduces water usage compared to conventional washing with a hose twice per week.
- The use of high efficiency closed cell cooling towers (water/air cooling) versus open cell design reduces water usage.
- Closed-loop cooling systems have been incorporated into the proposed facility expansion design to reduce water usage.

The UBC Storage Pad Stormwater Retention Basins, which serve the UBC Storage Pad and cooling tower blowdown water discharges, are lined to prevent infiltration. The basins are designed to retain a volume slightly more than twice that for the 24-hour, 100-year frequency storm at the UBC Storage Pads and an allowance for the cooling tower blowdown water. Designed for sampling and radiological testing of the contained water and sediment, this basin has no flow outlet. All discharge is through evaporation.

The Site Stormwater Detention Basin is designed with an outlet structure for drainage. Local terrain serves as the receiving area for this basin.

5.3 Ecological Resources

Mitigation measures are in place to minimize potential impact on ecological resources. These include the following items:

- Use of BMPs recommended by the State of New Mexico to minimize the construction footprint to the extent possible
- Use of detention and retention ponds
- Site stabilization practices to reduce the potential for erosion and sedimentation.

Proposed wildlife management practices include:

- The management of unused open areas (i.e., leave undisturbed), including areas of native grasses and shrubs for the benefit of wildlife.
- The use of native plant species (i.e., low-water consuming plants) to revegetate disturbed areas to enhance wildlife habitat.
- The use of animal-friendly fencing around ponds or basins so that wildlife cannot be injured or entangled.
- Minimize the amount of open trenches at any given time and keep trenching and backfilling crews close together.
- Trench during the cooler months (when possible).
- Avoid leaving trenches open overnight. Escape ramps will be constructed at least every 90 m (295 ft). The slope of the ramps will be less than 45 degrees. Trenches that are left open overnight will be inspected and animals removed prior to backfilling.

In addition to the proposed wildlife management practices above, UUSA will consider all recommendations of appropriate state and federal agencies, including the United States Fish and Wildlife Service and the New Mexico Department of Game and Fish.

5.4 Air Quality

In addition to the mitigation measures already in place to minimize potential impacts on air quality, additional Pumped GEVS will be installed at the proposed additional SBMs to treat emissions associated with the operation.

5.5 Nonradiological – Normal Operations

In addition to the mitigation measures already in place that minimize the impact of nonradiological gaseous and liquid effluents to well below regulatory limits, liquid waste will be solidified on site by a vendor and then disposed off-site, rather than being routed to collection tanks and undergoing evaporation treatment techniques.

5.6 Waste Management

The mitigation measures previously described in LES ER Section 5.2.13 are in place to minimize both the generation and impact of facility wastes. However, with the expansion, the UBCs may be triple stacked on the UBC Storage Pad.

6 ENVIRONMENTAL MEASUREMENTS AND MONITORING PROGRAMS

Chapter 6 of the LES ER describes the current UUSA environmental measurements and mitigation program. This discussion updates that description to reflect all current practices and the planned measurements and monitoring for the expansion.

6.1 Radiological Environmental Monitoring Program (REMP)

Monitoring and sampling activities, laboratory analyses, and reporting of facility-related radioactivity in the environment for current operations and the planned expansion are and will be conducted in accordance with industry-accepted and regulatory-approved methodologies and will also comply with UUSA's NMED Groundwater Discharge Permit DP-1481, future modifications to permit requirements, and additional state based regulatory requirements that may become applicable.

The Quality Control (QC) procedures used by the laboratories performing the UUSA facility's REMP will be adequate to validate the analytical results and will conform with the guidance provided in NRC Regulatory Guide 4.15. These QC procedures include the use of established standards such as those provided by the National Institute of Standards and Technology (NIST), as well as standard analytical procedures such as those established by the National Environmental Laboratory Accreditation Conference (NELAC).

Monitoring procedures will employ well-known acceptable analytical methods and instrumentation. The instrument maintenance and calibration program will be appropriate to the given instrumentation, in accordance with manufacturers' recommendations.

UUSA will ensure that the onsite laboratory and any contractor laboratory used to analyze site samples participates in third-party laboratory intercomparison programs appropriate to the media and analytes being measured. Examples of these third-party programs are: 1) Mixed Analyte Performance Evaluation Program (MAPEP) and the DOE Quality Assurance Program (DOEQAP) that are administered by the Department of Energy; and 2) Analytics Inc., Environmental Radiochemistry Cross-Check Program. UUSA will require that all radiological and non-radiological laboratory vendors are certified by the National Environmental Laboratory Accreditation Program (NELAP) or an equivalent state laboratory accreditation agency for the analytes being tested.

Reporting procedures will comply with the requirements of 10 CFR 70.59 and the guidance specified in NRC Regulatory Guide 4.16. Reports of the concentrations of principal radionuclides released to unrestricted areas in effluents will be provided and will include the Minimum Detectable Concentration (MDC) for the analysis and the error for each data point.

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. Data collected during the operational years will be compared to the baseline generated by the pre-operational data. Such comparisons provide a means of assessing the magnitude of potential radiological impacts on members of the public and in demonstrating compliance with applicable radiation protection standards.

During the course of facility operations, revisions to the REMP may be necessary and appropriate to assure reliable sampling and collection of environmental data. The rationale and actions behind such revisions to the program will be documented and reported to the appropriate regulatory agency, as required. REMP sampling focuses on locations within 4.8 km (3 mi) of the facility, but may also include distant locations as control sites. REMP sampling locations have been determined based on NRC guidance found in the document, "Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls for Boiling Water Reactors" (NRC, 1991), meteorological information, and current land use. The sampling locations may be subject to change as determined from the results of periodic review of land use.

Atmospheric radioactivity monitoring is based on plant design data, demographic and geologic data, meteorological data, and land use data. Operational releases are anticipated to be very low and subject to rapid dilution via dispersion. Distinguishing plant-related uranium from background uranium already present in the site environment is a major challenge of the REMP. A characteristic of ground-level plumes is that plume concentrations decrease continually as the distance from the release point increases. It logically follows that the impact at locations close to the release point is greater than at more distant locations. The concentrations of radioactive material in gaseous effluent from the UUSA are expected to be very low concentrations of uranium because of process and effluent controls. Consequently, air samples collected at locations that are close to the plant would provide the best opportunity to detect and identify plant-related radioactivity in the ambient air. Therefore, air-monitoring activities concentrate on collection of data from locations that are relatively close to the plant, such as the plant perimeter fence or the plant property line. Air monitoring stations are situated along the site boundary locations of highest predicted atmospheric deposition, and at special interest locations, such as a nearby residential area and business.

A control sample location has been established beyond 8 km (5 mi) in an upwind sector (the sector with least prevalent wind direction). Refer to NUREG-1790, for information on meteorology and atmospheric dispersion. All environmental air samplers operate on a continuous basis with sample retrieval for a gross alpha and beta analysis occurring on a biweekly basis (or as required by dust loads).

During the operational years, vegetation and soil sampling will continue to be performed to document environmental conditions. Groundwater samples from onsite monitoring well(s) will be collected in accordance with DP-1481.

In addition to the current monitoring program, a background monitoring well and dry well point were installed to collect data on background conditions. This well pair is located in the NNW sector of the UUSA facility (see Figure 6.1-2). They are located up-gradient of the UUSA and cross-gradient from the WCS facility. This location is intended to avoid potential contamination from both facilities, i.e., UUSA and/or WCS. 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.

The dry well or well point was installed here to monitor the zone directly above the aquitard: groundwater in the sand and gravel layer was not encountered at the UUSA facility during groundwater investigations, however this zone represents the most shallow layer where liquid/water would collect should there be a significant release.

The 70-m (230 ft) zone contains the first occurrence of groundwater beneath the site. Although not strictly meeting the definition of an aquifer, which requires that the unit be able to transit "significant quantities of water under ordinary hydraulic gradients," this layer will also be monitored.

Other surrounding industrial activities, the Wallach Quarry and the Sundance Services "produced water" lagoons north of the UUSA facility, have some potential to introduce contaminants that could reach the background monitoring well. The contaminants of concern for those facilities should be readily differentiated from potential contaminants from the site.

Sediment samples will be collected semiannually from both of the stormwater runoff retention/detention basins onsite to look for any buildup of uranic material being deposited. If no new sediment has been deposited, no sample will be taken.

Sanitary wastewater will be sent to the City of Eunice Wastewater Treatment Plant via a system of lift stations and 8 inch sewage lines. No plant process related effluents will be introduced into the sewage systems.

Because the offsite dose equivalent rate from stored UBCs is expected to be very low and difficult to distinguish from the variance in normal background radiation beyond the site boundary, demonstration of compliance will rely on a system that combines direct dose equivalent measurements and computer modeling to extrapolate the measurements. Environmental TLDs placed at the plant perimeter fence line or other location(s) close to the UBCs will estimate direct dose equivalent information. The direct dose equivalent at offsite locations will be estimated through extrapolation of the quarterly TLD data using the Monte Carlo N-Particle (MCNP) computer program (ORNL, 2000a) or a similar computer program.

The REMP may be enhanced during the operation of the facility as necessary to maintain the collection and reliability of environmental data based on changes to regulatory requirements or facility operations. The REMP includes monitored air effluent action levels (requiring further analysis) and reporting levels for radioactivity in other environmental samples.

The REMP falls under the oversight of the facility's QA program. Therefore, written procedures to ensure representative sampling, proper use of appropriate sampling methods and equipment, proper locations for sampling points, and proper handling, storage, transport, and analyses of effluent samples will be a key part of the program. In addition, written procedures ensure that sampling and measuring equipment, including ancillary equipment such as airflow meters, are properly maintained and calibrated at regular intervals. UUSA will conform with leak detection recommendations in NUREG-1520.

Within 60 days after January 1 and July 1 of each year, UUSA shall submit a Semi-Annual Radiological Effluent Release Report (SARERR) addressed to the attention of: Document Control Desk, Director, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, with a copy sent to the appropriate NRC Regional Office.

The SARERR shall specify the quantity of each of the principal radionuclides released to unrestricted areas in liquid and gaseous effluents during the previous six months of operation, and such other information as the Commission may require to estimate maximum potential annual radiation doses to the public resulting from effluent releases.

A section of the report shall assess performance relative to 10 CFR 20.1101.d, 10 CFR 20.1301 and 10 CFR 20.1302, as described in NRC Regulatory Guide 4.20. In addition, the report will summarize or reference environmental monitoring program changes.

If quantities of radioactive materials released during the reporting period are significantly above the licensee's design objectives previously reviewed as part of the licensing action, the report must cover this specifically.

6.1.1 Section 6.1 Tables

Table 6.1-1 Effluent Sampling Program

Effluent	Sample Location	Sample Type	Sample Frequency
Gaseous	Pumped Extract GEVS Stack CRDB GEVS Stack CRDB Local Extract Stack Centrifuge Test and Post Mortem Facilities Exhaust Filtration System Stack	Continuous Air Particulate Filter	Gross Alpha/Beta-Weekly +/- 25% Isotopic Analysis[a] - Quarterly
Liquid	UBC Basin	Liquid	As required by DP-1481
Solid	UBC Basin	Sediment	As required by DP-1481

[a] Isotopic analysis for ^{234}U, ^{235}U, and ^{238}U.

Table 6.1-2 Required Lower Level Of Detection For Effluent Sample Analyses

Effluent Type	Nuclide	MDC[a] in Bq/ml (μCi/ml)
Gaseous	^{234}U ^{235}U ^{238}U Gross Alpha	$3x10^{-10}$ ($1.0x10^{-14}$) $3x10^{-10}$ ($1.0x10^{-14}$) $3x10^{-10}$ ($1.0x10^{-14}$) $3x10^{-10}$ ($1.0x10^{-14}$)
Liquid	^{234}U ^{235}U ^{238}U	$3x10^{-4}$ ($3.0x10^{-9}$) $3x10^{-4}$ ($3.0x10^{-9}$) $3x10^{-4}$ ($3.0x10^{-9}$)

[a] The gaseous MDCs are 1% of the limits in 10 CFR 20 Appendix B, Table 2 Effluent Concentrations.

The liquid and solid MDCs are less than 2% of the limits in 10 CFR 20 Appendix B, Table 2 Effluent Concentrations

Table 6.1-3 Radiological Environmental Monitoring Program

Sample Type	Number of Sample Locations[c]	Sampling and Collection Frequency	Type of Analysis
Continuous Airborne Particulate	6	Continuous operation of air sampler with sample collection as required by dust loading but at least biweekly. Quarterly composite samples by location.	Gross beta/gross alpha analysis for each filter change. Quarterly isotopic analysis on composite sample.
Basins	1 from each basin[b]	4-L (1.06-gal) water sample/1 to 2-kg (2.2 to 4.4-lb) sediment sample collected in accordance with DP-1481	Isotopic analysis[a]
Sewage System	1	500ml sample in accordance with DP-1481	Isotopic analysis[a]

a Isotopic analysis for ^{234}U, ^{235}U, and ^{238}U.

b Site Stormwater Detention Basin and UBC Storage Pad Stormwater Retention Basin when water available during scheduled sampling

c. Due to regional conditions, sample locations and numbers may vary.

6.1.2 Section 6.1 Figures

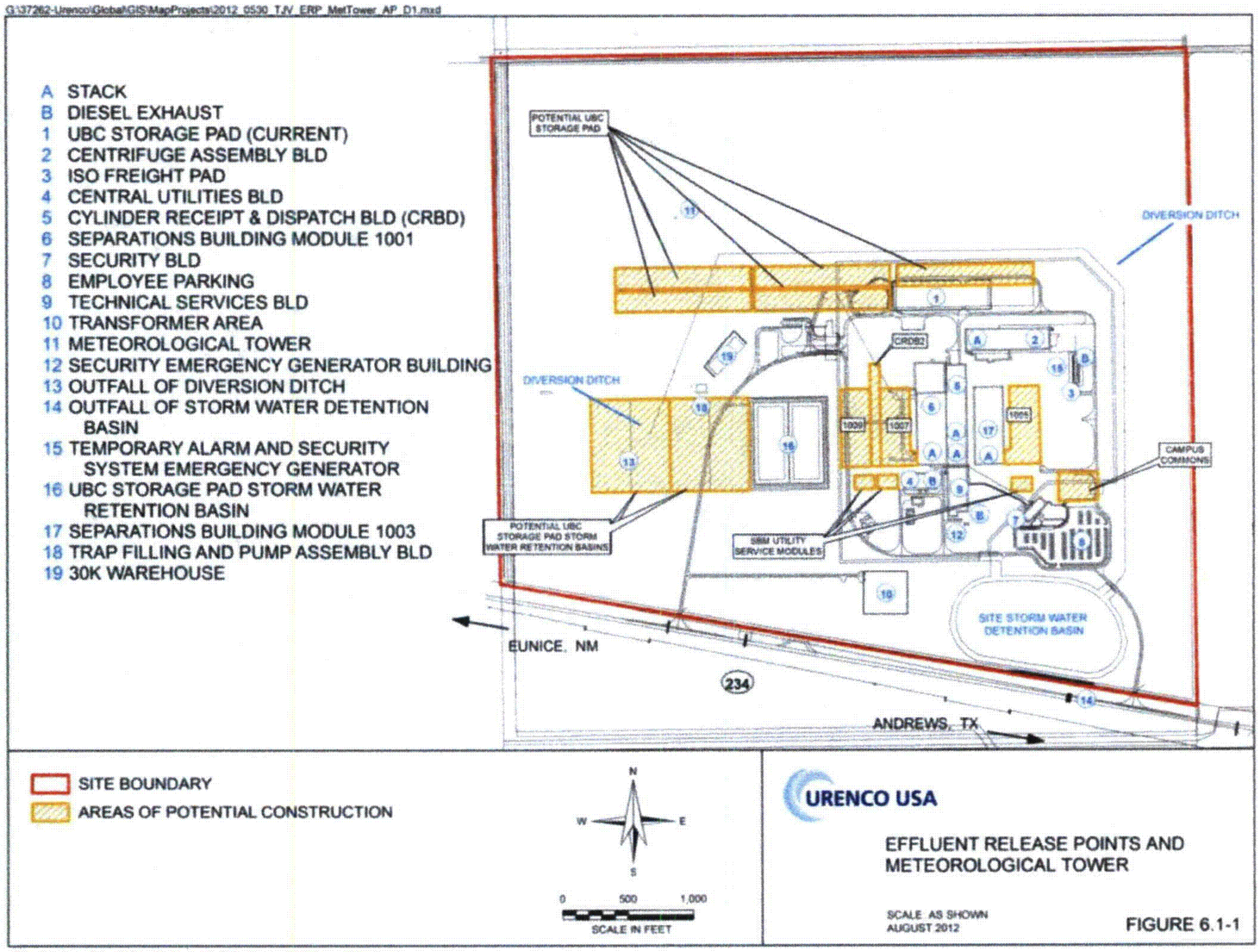

Figure 6.1-1 Effluent Release Points and Meteorological Tower

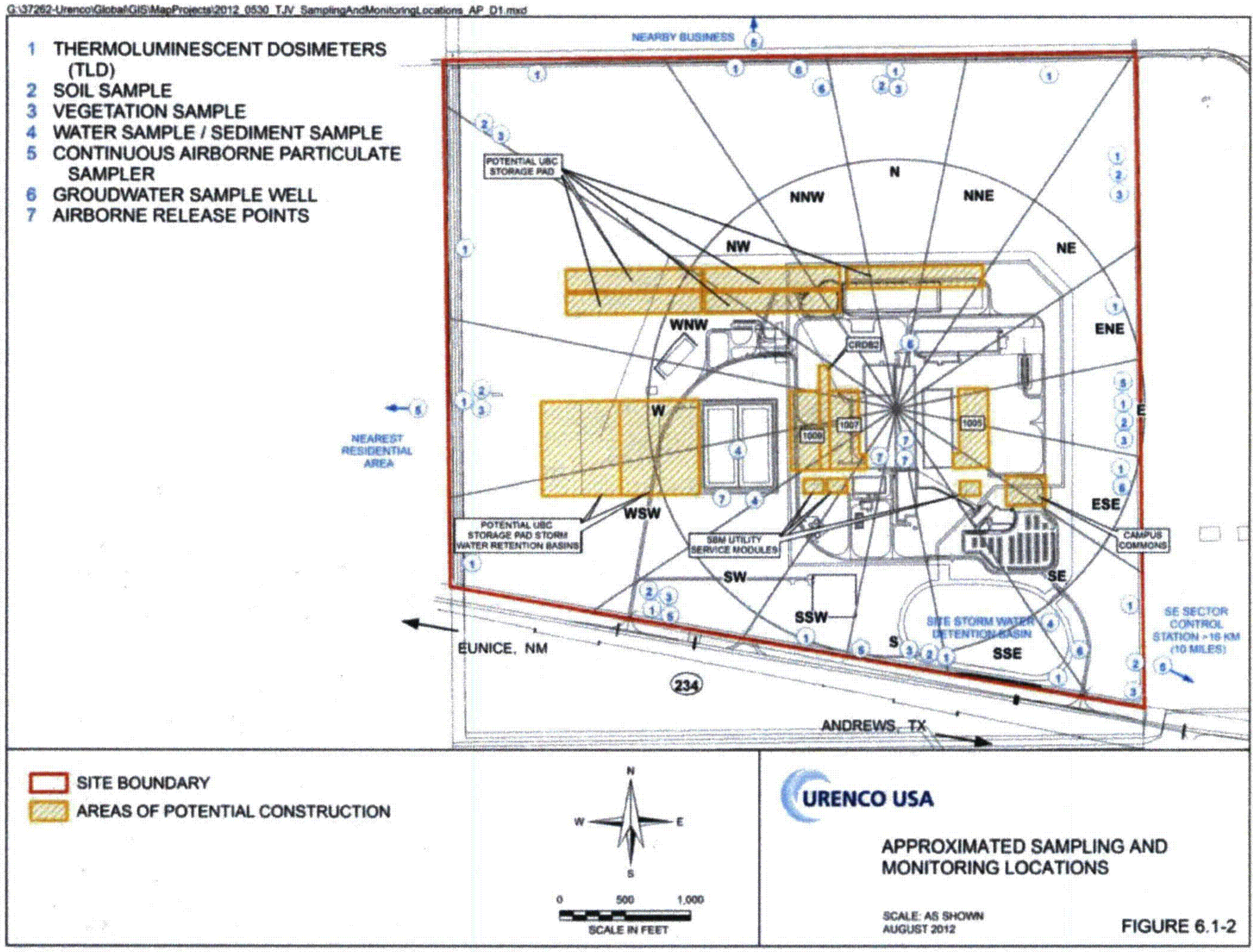

Figure 6.1-2 Approximated Sampling and Monitoring Locations

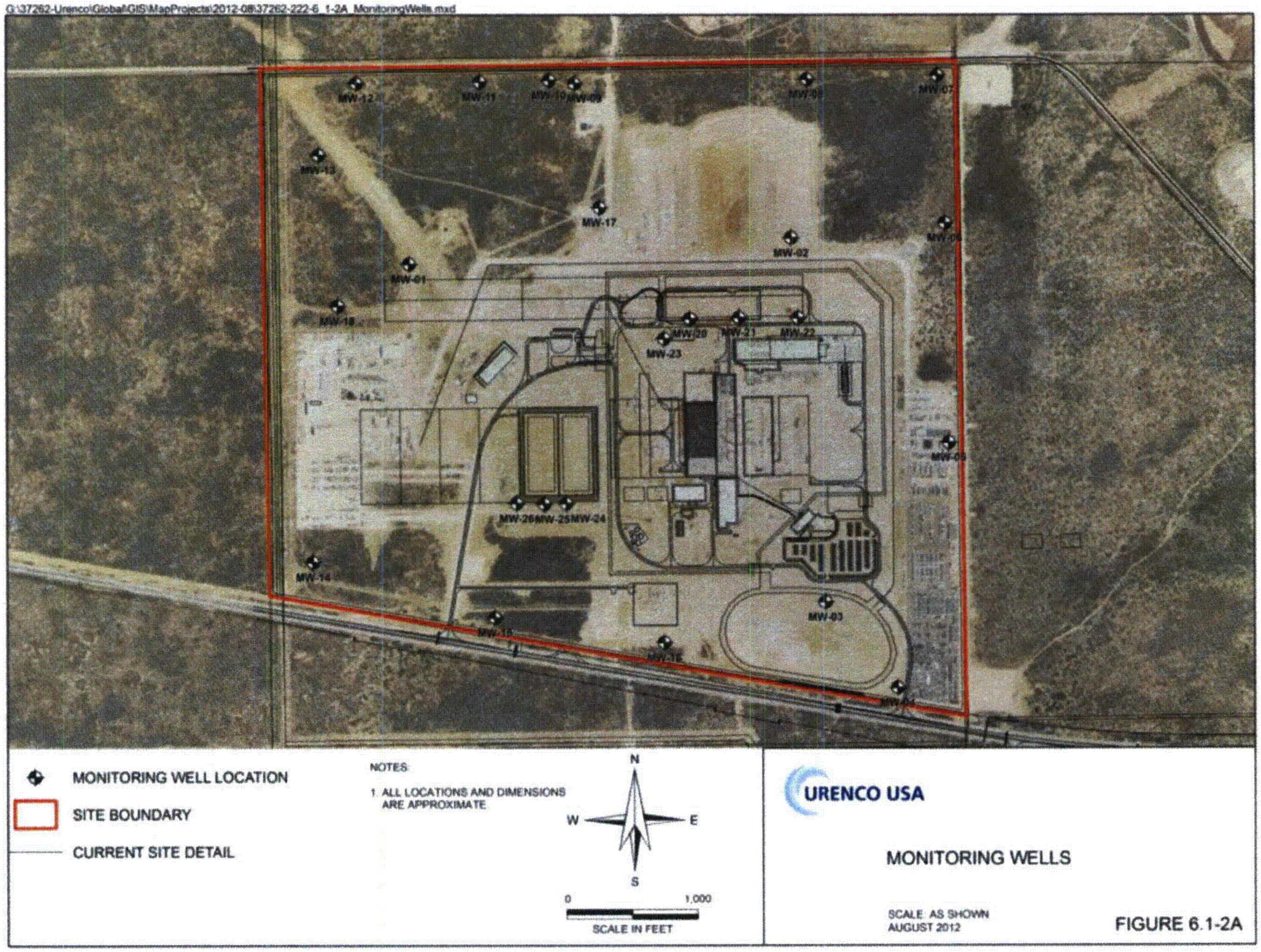

Figure 6.1-3 Monitoring Wells

6.2 Physiochemical Monitoring

The primary objective of physiochemical monitoring is to provide verification that the operations do not result in detrimental chemical impacts to the environment. Effluent controls, which are discussed in Supplemental ER Sections 3.12, Waste Management and 4.13, Waste Management Impacts, are in place to assure that chemical concentrations in gaseous and liquid effluents are maintained as low as reasonably achievable (ALARA). In addition, physiochemical monitoring provides data to confirm the effectiveness of effluent controls.

Administrative action levels will be implemented prior to facility operation to ensure that chemical discharges will remain below the limits specified in the facility discharge permits. The limits are specified by the New Mexico Water Quality Bureau (NMWQB) Groundwater Discharge Permit/Plan.

Specific information regarding the source and characteristics of all non-radiological plant effluents and wastes that will be collected and disposed of offsite, or discharged in various effluent streams, is provided in Supplemental ER Sections 3.12 and 4.13.

In conducting physiochemical monitoring, sampling protocols and emission/effluent monitoring are performed for routine operations with provisions for additional evaluation in response to potential accidental release.

The Chemistry Laboratory is located in the CRDB and used to perform analyses that include the following:

- Hazardous material presence in waste samples
- pH, oil and other contaminants in liquid effluents

The Environmental Monitoring Laboratory will be available to perform analyses on air, water, soil, flora, and fauna samples obtained from designated areas around the plant. In addition to its environmental and radiological capabilities, the Environmental Monitoring Laboratory is also capable of performing bioassay analyses when necessary. Currently the laboratory does not yet have these capabilities and UUSA contracts with commercial, offsite laboratories to perform these analyses. Once the laboratory is running, the offsite laboratories may continue to be used to supplement onsite capabilities.

Waste liquids, solids, and gases from enrichment-related processes and decontamination operations will be analyzed and/or monitored for chemical and radiological contamination to determine safe disposal methods and/or further treatment requirements.

6.2.1 Evaluation and Analysis of Samples

Samples of liquid effluents, solids, and gaseous effluents from plant processes will be analyzed by qualified laboratories. Results of process samples analyses are used to verify that process parameters are operating within expected performance ranges.

6.2.2 Effluent Monitoring

Chemical constituents that may be discharged to the environment in facility effluents will be below concentrations that have been established by state and federal regulatory agencies as protective of the public health and the natural environment. Under routine operating conditions, no significant quantities of contaminants will be released from the facility. This will be confirmed through monitoring and collection and analysis of environmental data. The facility does not directly discharge any industrial effluents to surface waters or grounds offsite. Except for sanitary waste reporting to the City of Eunice Wastewater Treatment plant from the site Sewage System, all liquid effluents are contained via collection tanks and retention basins.

Parameters for continuing environmental performance will be developed from the baseline data from additional preoperational sampling, and from those parameters required in the state issued Discharge Permit. Operational monitoring surveys will also be conducted using sampling sites and at frequencies established from baseline sampling data and as determined based on requirements contained in the NMWQB Groundwater Discharge Permit.

The frequency of some types of samples may be modified depending on baseline data for the parameters of concern. The monitoring program is designed to use the minimum percentage of allowable limits (lower limits of detection). As construction and operation of the enrichment plant proceeds, changing conditions (e.g., regulations, site characteristics, and technology) and new knowledge may require that the monitoring program be reviewed and updated. The monitoring program will be enhanced as appropriate to maintain the collection and reliability of environmental data. The specific location of monitoring points will be determined in detailed design.

During execution of the monitoring program, some samples may be collected in a different manner/method than specified herein. Examples of reasons for these deviations include severe weather events, changes in the length of the growing season, and changes in the number of plantings. Under these circumstances, documentation shall be prepared to describe how the samples were collected and the rationale for any deviations from normal monitoring program methods. If a sampling location has frequent unavailable samples or deviations from the schedule, then another location may be selected or other appropriate actions taken.

UUSA will submit a summary of the environmental sampling program and associated data to the proper regulatory authorities, as required. This summary will include the types, numbers, and frequencies of samples collected.

Physiochemical monitoring will be conducted via sampling of stormwater, soil, sediment, vegetation, and groundwater to confirm that discharges are below regulatory limits. There are no surface waters on the site, therefore no Surface Water Monitoring Program will be implemented; however soil sampling will include outfall areas such as the outfall at the UUSA site Stormwater Detention Basin. In the event of any off-site release of a regulated contaminant, these sampling protocols will be initiated immediately and on a continuing basis to document the extent/impact of the release until conditions have been abated and mitigated.

Sanitary sewage will be sampled as warranted, in accordance with the applicable discharge permit or treatment facility requirements.

6.2.3 Stormwater Monitoring Program

UUSA currently implements a stormwater monitoring program for ongoing construction of the facility, and it will continue to do so during the proposed expansion. Data collected from the program is used to evaluate the effectiveness of measures taken to prevent the contamination of stormwater and to retain sediments within property boundaries.

6.2.4 Environmental Monitoring

The purpose of this section is to describe the surveillance-monitoring program, which will be implemented to measure non-radiological chemical impacts upon the natural environment.

Non-radiological impact monitoring is regulated by the State of New Mexico through permitting. The ability to detect and contain any potentially adverse chemical releases from the facility to the environment will depend on chemistry data to be collected as part of the effluent and stormwater monitoring programs described in the preceding sections. Data acquisition from these programs encompasses both onsite and offsite sample collection locations and chemical element/compound analyses. Final constituent analysis requirements will be in accordance with permit mandates.

Sampling locations will be determined based on meteorological information and current land use. The sampling locations may be subject to change as determined from the results of any observed changes in land use.

The range of chemical surveillance incorporated into all the planned effluent monitoring programs for the facility are designed to be sufficient to predict any relevant chemical interactions in the environment related to plant operations.

Vegetation and soil sampling will be conducted. Vegetation samples will include grasses and local vegetation. Soil will be collected in the same vicinity as the vegetation sample. The samples are collected from both onsite and offsite locations in various sectors. Sectors are chosen based on air modeling. Sediment samples will be collected from discharge points to the different collection basins onsite. At this time, groundwater samples will be collected from a series of wells installed around the plant. The locations of the current groundwater sampling (monitoring) wells are as described in Section 6.1 and are shown in Figure 6.1-3.

Stormwater samples collected in the UBC Storage Pad Stormwater Retention Basins will be sampled to ensure no contaminants are present in the UBC Storage Pad runoff.

6.2.5 Meteorological Monitoring

Measurement instrumentation is currently be located at a height of approximately 10 meters (33 feet) from the finished grade of the nearest building structure and at 40 meters (130 feet) from the finished grade. This data assists in evaluating the potential locales on and off property that could be influenced by any emissions. The instrument tower is located at a site with approximately the same elevation as the finished facility grade and in an area where facility structures will have little or no influence on the meteorological measurements. An area approximately ten times the obstruction height around the tower towards the prevailing wind direction will be maintained in accordance with established standards for meteorological measurements. This practice will be used to avoid spurious measurements resulting from local building-caused turbulence. The program for instrument maintenance and servicing, combined with redundant data recorders, assures at least 90% data recovery.

The data this equipment provides is recorded in the Control Room and can be used for dispersion calculations. The equipment will also measure temperature and humidity.

6.2.6 Biota

The monitoring of radiological and physiochemical impacts to biota are detailed in Supplemental ER Section 6.3, Ecological Monitoring.

6.2.7 Quality Assurance

Quality assurance will be achieved by following a set of formalized and controlled procedures that UUSA will create, implement and periodically review for sample collection, lab analysis, chain of custody, reporting of results, and corrective actions. Corrective actions will be instituted when an action level is exceeded for any of the measured parameters. Action levels will be divided into three priorities: 1) if the sample parameter is reported at a concentration that exceeds an upper tolerance limit of the normal background level; 2) if the sample parameter is reported at a concentration that exceeds an administrative limit; or 3) if the sample parameter is reported at a concentration that exceeds a regulatory limit or concentration that is protective for public health and the environment. Corrective actions will be implemented to ensure that the cause for the action level exceedance can be identified and immediately corrected, applicable regulatory agencies are notified, if required, communications to address lessons learned are dispersed to appropriate personnel, and applicable procedures are revised accordingly if needed. All action plans will be commensurate to the severity of the exceedance.

UUSA will ensure that the onsite laboratory and any contractor laboratory used to analyze UUSA samples participates in third-party laboratory intercomparison programs appropriate to the media and analytes being measured. Examples of these third-party programs are the Mixed Analyte Performance Evaluation Program (MAPEP) and the DOE Quality Assurance Program (DOEQAP) that are administered by the Department of Energy. UUSA will require all radiological and non-radiological laboratory vendors to be certified by the National Environmental Laboratory Accreditation Conference (NELAC) or an equivalent state laboratory accreditation agency for the analytes being tested.

6.2.8 Lower Limits of Detection

Lower limits of detection for the parameters sampled for in the Stormwater Monitoring Program are listed in Table 6.2-2, Stormwater Monitoring Program. Lower limits of detection (LLD) for the nonradiological parameters shown in Table 6.2-1, Physiochemical Sampling, will be based on the results of the baseline surveys and the type of matrix (sample type).

6.2.9 Section 6.2 Tables

Table 6.2-1 Physiochemical Sampling[3]

Sample Type[3]	Sample Location[3]	Frequency[3]	Sampling and Collections[2,3]
Stormwater	Site Stormwater Detention Basin UBC Storage Pad Stormwater Retention Basin	Quarterly or as required by permit	Analytes as determined by baseline program
Vegetation	4 minimum[1]	Quarterly or as required by permit (growing seasons)	Fluoride uptake
Soil/Sediment	4 minimum[1]	Quarterly or as required by permit	Metals and fluoride uptake
Groundwater	All selected groundwater wells	Semiannually or a required by permit	Metals

1 Location identified in site procedures and by applicable permits.

2 Analyses will meet EPA Lower Limits of Detection (LLD), as applicable, and will be based on the baseline surveys and the type of matrix (sample type).

3 All physiochemical sampling will be driven by permit

Table 6.2-2 Stormwater Monitoring Program

Stormwater Monitoring Program for Detention and Retention Basins* (See Figure 4.4-1)

Monitored Parameter	Monitoring Frequency	Sample Type	LLD
Oil & Grease	As required by permit	Grab	0.5 ppm
Total Suspended Solids	As required by permit	Grab	0.5 ppm
5-Day Biological Oxygen Demand (BOD)	As required by permit	Grab	2 ppm
Chemical Oxygen Demand (COD)	As required by permit	Grab	1 ppm
Total Phosphorus	As required by permit	Grab	0.1 ppm
Total Kjeldahl Nitrogen	As required by permit	Grab	0.1 ppm
pH	As required by permit	Grab	0.01 units
Nitrate plus Nitrite Nitrogen	As required by permit	Grab	0.2 ppm
Metals	As required by permit	Grab	Varies**

* Site Stormwater Detention Basin, UBC Storage Pad, Stormwater Detention Basin and any temporary basins used during construction.

** Analyses will meet EPA Lower Limits of Detection (LLD), as applicable, and will be based on the baseline surveys and the type of matrix (sample type).

Note: Radiological monitoring parameters are addressed separately

6.3 Ecological Monitoring

6.3.1 Maps

See Modified Site Features with Sampling Stations and Monitoring Locations, Figure 6.1-2.

6.3.2 Affected Important Ecological Resources

The existing natural habitats on the UUSA site and the region surrounding the site have been impacted by domestic livestock grazing, oil/gas pipeline right-of-ways and access roads. These current and historic land uses have resulted in a dominant habitat type, the Plains Sand Scrub. Hundreds of square kilometers (miles) of this habitat type occur in the area of the UUSA facility. The habitat type at the site does not support any rare, threatened, or endangered animal or plant species. The Plains Sand Scrub vegetation type is characterized by shinnery oak shrub, mesquite shrub, and short to mid-grass prairie with little or no overhead cover.

Based on ecological surveys that have been performed onsite, UUSA has concluded that there are no important ecological systems onsite that are especially vulnerable to change or that contain important species habitats, such as breeding areas, nursery, feeding, resting, and wintering areas, or other areas of seasonally high concentrations of individuals of important species. The species selected as important (the mule deer and scaled quail) are both highly mobile, generalist species and can be found throughout the site area. Wildlife species on the UUSA site typically occur at average population concentrations for the Plains Sand Scrub habitat type.

The nearest suitable habitat for species of concern are several kilometers (miles) from the UUSA site. The closest known populations of the Sand Dune Lizard occur approximately 4.8 km (3 mi) north of the site. A population of Lesser Prairie Chickens has been observed approximately 6.4 km (4 mi) north of the UUSA site. No Black-Tailed Prairie Dogs have been determined to be present at the UUSA site.

6.3.3 Monitoring Program Elements

Several elements were selected for the initial ecological monitoring program. These elements included vegetation, birds, mammals, and reptiles/amphibians. Currently there is no action or reporting level for each specific element. However, additional consultation with all appropriate agencies (New Mexico Department of Game & Fish, US Fish & Wildlife Service (USFWS)) will continue. Agency recommendations based on future consultation and monitoring program data will be considered when developing action and/or reporting levels for each element. In addition, UUSA will periodically monitor the site property and basin waters during construction and plant operations to ensure the risk to birds and wildlife is minimized. If needed, measures will be taken to release entrapped wildlife. The monitoring program will assess the effectiveness of the entry barriers and release features to ensure risk to wildlife is minimized.

6.3.4 Observations and Sampling Design

UUSA site observations included pre-construction and construction monitoring programs. The pre-construction monitoring program established the site baseline data. The procedures used to characterize the plant, bird, mammalian, and reptilian/amphibian communities at the UUSA site during pre-construction monitoring are considered appropriate and will be used for both construction monitoring programs. Based on the findings from the pre-construction and construction programs, monitoring for bird, mammalian, and reptilian/amphibian communities is not warranted. Additional monitoring will only be warranted if it is determined that a site-related release could adversely affect an indicator population.

These surveys were intended to be sufficient to characterize baseline conditions and identify if there are sensitive species that warrant additional continued monitoring. Based on the lack of threatened or endangered species, ongoing monitoring for fauna is not necessary to be completed in addition to the radiological and physiochemical monitoring required by the REMP, SARERR, and Groundwater Discharge Permit DP-1481 requirements. Vegetation sampling will continue as required by the regulation and permits noted above.

Additional monitoring will only be warranted if soil, groundwater, or vegetation samples, collected as part of the REMP, SARERR program, or the LES groundwater discharge permit indicates a site related release that could adversely affect the reptile population.

Vegetation

Vegetative sampling will be performed as required by permit and/or part of the REMP.

Birds

Site-specific avian surveys were conducted in both the wintering and breeding seasons to verify the presence of particular bird species at the UUSA facility. No endangered bird species were noted. Therefore, no further bird surveys are required. Refer to Section 3.9, Ecological Resources, of NUREG-1790, for more detail.

Mammals

The existing mammalian communities are described in Section 3.5 of the LES ER. General observations were compiled concurrently with other wildlife monitoring data and compared to information listed in LES ER Table 3.5-1, Mammals Potentially Using the UUSA Site. Surveys were conducted during pre-construction and construction activities, however because there are no identified threatened or endangered species at the facility, long term mammal studies are not warranted.

Reptiles and Amphibians

There are several groups of reptile and amphibian species (lizards, snakes, amphibians) that provide the biological characteristics (demographics, life history characteristics, site specificity, environmental sensitivity) for an informative environmental monitoring program. Approximately 13 species of lizards, 13 species of snakes, and 11 species of amphibians may occur on the UUSA site and in the area (LES ER Table 3.5-3). Because there are no identified threatened or endangered species at the facility, long term Reptile and Amphibian studies are not warranted.

6.3.5 Statistical Validity of Sampling Program

Any proposed sampling program will include descriptive statistics. These descriptive statistics will include the mean, standard deviation, standard error, and confidence interval for the mean. In each case the sampling size will be clearly indicated. The use of these standard descriptive statistics will be used to show the validity of the sampling program. A significance level of 5% will be used for the studies, which results in a 95% confidence level.

6.3.6 Sampling Equipment

Due to the type of ecological monitoring proposed for the UUSA, no specific sampling equipment is necessary.

6.3.7 Method of Chemical Analysis

Due to the type of monitoring proposed for the UUSA, no chemical analysis is proposed for ecological monitoring.

6.3.8 Data Analysis and Reporting Procedures

UUSA or its contractor will analyze the ecological data collected at the UUSA facility. Responsibility for the data analysis resides with the Environmental Compliance Officer.

A summary report will be prepared, which will include the types, numbers, and frequencies of samples collected.

6.3.9 Agency Consultation

Ecologically-focused consultation was performed with all appropriate federal and state agencies to the initial site construction and operation. A summary of consultations that have been conducted is provided in Table 1.4-1. Because of the limited impacts of the expansion, no new ecologically-focused consultations are needed.

6.3.10 Organizational Unit Responsible for Reviewing the Monitoring Program on an Ongoing Basis

As policy directives are developed, documentation of the environmental monitoring programs will occur. The person or organizational unit responsible for reviewing the program on an ongoing basis will be the Environmental Compliance Officer.

6.3.11 Established Criteria

The ecological monitoring program is conducted in accordance with generally accepted practices and the requirements of the New Mexico Department of Game and Fish. Data will be collected, recorded, stored, and analyzed. Actions will be taken as necessary to reconcile anomalous results.

6.3.12 Data Recording and Storage

Data relevant to the ecological monitoring program will be recorded in paper and/or electronic forms. This data will be kept on file for the life of the facility.

7 COST BENEFIT ANALYSIS

This chapter describes the economic and qualitative socioeconomic and environmental impacts of the expansion and the No-Action Alternative.

7.1 Economic Cost-Benefits, Plant Construction and Operation

The initial LES ER analyzed the economic impact of the construction of the UUSA facility in Lea County, New Mexico, and identified the direct impacts of eight years of construction and the plant itself on revenues of local businesses, on incomes accruing to households, on employment, and on the revenues of state and local government (see LES ER Section 7.1). Further, it explored the indirect impacts of the UUSA facility on local entities using a model showing the interaction of economic sectors in Lea County.

This capacity expansion will continue, but not expand, the economic impacts described in the LES ER from the construction. For example, staff levels are not anticipated to increase significantly with the expansion. Therefore the economic analysis conducted in the LES ER remains applicable and is incorporated by reference. Please reference the text and tables of Section 4.10 for updated information regarding economic impact of an expanded capacity facility.

7.2 Environmental Cost- Benefit for Plant EXPANSION

This section describes qualitatively the environmental costs and benefits of the UUSA capacity expansion in Lea County, New Mexico. Table 7.2-1, Qualitative Environmental Costs/Benefits of UUSA During Construction and Operation and for Expansion, summarizes the results.

7.2.1 Existing Site

There will be minimal additional disturbance to the existing site features at the project site associated with the ongoing construction activities to support the facility capacity expansion. Site disturbance associated with clearing and earthmoving activities is anticipated to be limited to the previously disturbed 394 areas. Excavated soils associated with necessary construction ground improvements will continue to be stockpiled on site to the northeast portion of the property. Site property outside the disturbed plant area will generally be left in its pre-construction condition or improved through stabilization as needed.

7.2.2 Land Conservation and Erosion Control Measures

UUSA anticipates there will be some short-term increases in soil erosion at the site due to expansion construction activities. Erosion impacts due to site clearing, excavation, if required, and grading will be mitigated by utilization of proper construction and erosion best management practices (BMPs). These practices include minimizing the construction footprint to the extent possible, mitigating discharge including stormwater runoff (i.e., the use of detention and retention ponds), the protection of all unused naturalized areas, and site stabilization practices to reduce the potential for erosion. Only about one-quarter of the site will be involved in construction activities at any one time. Cleared areas will be seeded as soon as practicable and watering will be used to control fugitive dust. Water conservation will be considered when deciding how often dust suppression sprays will be applied.

7.2.3 Aesthetic Changes

Visual and noise impacts due to the capacity expansion activities are anticipated to be minimal, due to the remote location of the site and the buffer zone along the outer perimeter of the property boundary. Some elevated and intermittent noise levels during construction may be discernible offsite but should not constitute an annoyance to nearby residences since the nearest resident is 4.3 km (2.63 mi) away. The visual intrusion of UUSA will only minimally change the current skyline that constitutes the plant now and should not be objectionable given the vegetative buffer around the site, current existing structures, and its remote location.

7.2.4 Ecological Resources

Pre-construction and construction activities at the site are not expected to have any significant adverse impact on vegetation and wildlife. UUSA anticipates that construction activities within the existing clear-cut area will remove some shrub vegetation and cause some small animal life to relocate on the site. No proposed activities will impact communities or habitats defined as rare or unique, or that support threatened and endangered species, since no such communities or habitats have been identified anywhere within the site.

7.2.5 Access Roads and Local Traffic

All traffic into and out of the site will be along New Mexico Highway 176 because Highway 176 is dedicated to heavy-duty use and built to industrial standards, it would be able to handle increased heavy-duty traffic adequately. Additionally, due to the already substantial truck traffic using these roads to access Andrews County, Texas there would be little additional effect on other road users.

7.2.6 Water Resources

Water quality impacts will be controlled during construction by compliance with the State of New Mexico's water quality regulations and the use of BMPs as detailed in the site Stormwater Pollution Prevention Plan (SWPPP). UUSA is exempt from the SPCC plan. However, BMPs will be implemented to minimize the possibility of spills of hazardous substances, minimize the environmental impact of any spills. Site procedures will be in place to ensure prompt and appropriate remediation, as warranted. Site procedures will also identify individuals and their responsibilities for implementation of the corrective actions and provide for prompt notifications of state and local authorities as needed.

7.2.7 Noise and Dust Control Measures

Objectionable construction noises are to be reduced to acceptable levels by use of noise control equipment on all powered equipment. Shrub and vegetation buffer areas, which will be left around the plant property, will combine to reduce noise. Since substantial truck traffic already exists along New Mexico State Highway 176, the temporarily increased noise levels along Highway 176 due to construction activities are not expected to adversely affect nearby residents.

Traffic areas during construction will be watered as necessary to prevent dust. Water conservation will be considered when deciding how often dust suppression sprays will be applied.

7.2.8 Socioeconomic

Construction of the UUSA facility expansion is expected to continue to result in the same socioeconomic impacts on the region created by the initial construction and operation of the UUSA facility. In the initial ER, the Regional Input-Output Modeling System (RIMS II) was used to estimate various indirect impacts associated with each of the expenditures related to the initial construction of the UUSA facility. According to the RIMS II analysis, the region's residents were expected to receive an annual impact of $53 million in increased economic activity for local businesses, $38 million in increased earnings by households, and an annual average of 1,102 new jobs during the 8-year initial construction period. The temporary influx of labor was not expected to overload local services and facilities within the Hobbs-Eunice, New Mexico area.

The expansion will continue these economic benefits through completion of construction in 2020.

7.2.9 Surface and Groundwater Quality

Liquid effluents at UUSA will include stormwater runoff, sanitary and industrial wastewater, and treated radiologically contaminated wastewater. Radiologically contaminated process water will be solidified and disposed of off-site. Site stormwater runoff from the Uranium Byproduct Cylinder (UBC) Storage Pad is routed to the UBC Storage Pad Stormwater Retention Basin. The general site runoff is routed to the Site Stormwater Detention Basin. Stormwater discharges will be regulated during construction and operation.

7.2.10 Terrestrial and Aquatic Environments

No communities or habitats defined as rare or unique or that support threatened and endangered species, have been identified anywhere on the UUSA site. Thus, no operation activities are expected to impact such communities or habitats.

7.2.11 Air Quality

No adverse air quality impacts to the environment, either on or offsite are anticipated to occur. Air emissions from the facility during normal facility operations will be limited to the plant ventilation air and gaseous effluent systems. All plant process/gaseous air effluents are to be filtered and monitored on a continuous basis for chemical and radiological contaminants, which could be derived from the UF_6 process system. If any UF_6 contaminants are detected in ambient in plant air systems, the air is treated by appropriate filtration methods prior to its venting to the environment. Two existing and three additional standby diesel generators and a security diesel generator will supply standby electrical power. These generators will operate only in the event of power interruptions and for routine testing and will have negligible health and environmental impacts.

7.2.12 Visual/Scenic

No impairments to local visual or scenic values will result due to the operation of the expanded UUSA facility. The facility and associated structures will be relatively compact, and are located in a rural location. No offensive noises or odors will be produced as a result of plant operations.

7.2.13 Socioeconomic

The socioeconomic impacts of the expansion are very similar to those of the initial construction. No significant impacts are expected to occur for any local area infrastructure (e.g., schools, housing, water, and sewer). Costs of operation should be diffused sufficiently throughout the Hobbs-Eunice, New Mexico area to be indistinguishable from normal economic growth. The primary difference is that the expansion will expand the length of those construction jobs, and subsequent other socioeconomic impacts, until approximately 2020.

7.2.14 Radiological Impacts

Potential radiological impacts from operation of the expanded UUSA facility would result from controlled releases of small quantities of UF_6 during normal operations and releases of UF_6 under hypothetical accident conditions.

The estimated maximum annual effective dose equivalent and maximum annual organ (lung) committed dose equivalents from gaseous effluent to an adult located at the plant site south boundary from previous evaluations were 1.7 x 10^{-4} mSv (1.7 x 10^{-2} mrem) and 1.4 x 10^{-3} mSv (1.4 x 10^{-1} mrem), respectively. The maximum effective dose equivalent and maximum annual organ (lung) dose equivalent from discharged gaseous effluent to the nearest resident (teenager) located 4.3 km (2.63 mi) in the west sector were expected to be less than 1.7 x 10^{-5} mSv (1.7 x 10^{-3} mrem) and 1.2 x 10^{-4} mSv (1.2 x 10^{-2} mrem), respectively.

For the initial site evaluation the estimated maximum annual effective dose equivalent and maximum annual organ (lung) committed dose equivalents from liquid effluent to an adult at the south site boundary are 1.7 x 10^{-5} mSv (1.7 x 10^{-3} mrem) and 1.5 x 10^{-4} mSv (1.5 x 10^{-2} mrem), respectively. The estimated maximum annual effective dose equivalent and maximum annual organ (lung) committed dose equivalents from liquid effluent to an individual (teenager) at the nearest residence are 1.7 x 10^{-6} mSv (1.7 x 10^{-4} mrem) and 1.3 x 10^{-5} mSv (1.3 x 10^{-3} mrem), respectively.

The maximum annual dose equivalent due to external radiation from the UBC Storage Pad (skyshine and direct) is estimated to be less than 3.8 x 10-2 mSv (3.8 mrem) to the maximally exposed person at the nearest point on the western site boundary (2,000 hrs/yr) to the east, approximately 9.3 x 10^{-2} mSv (9.3 mrem) for the maximally exposed person to the north boundary (2000 hours/yr), and less than 8 x 10-12 mSv/yr (8x10-10 mrem/yr) to the maximally exposed resident (8,760 hrs/yr) located approximately 4.3 km (2.63 mi) from the UBC Storage Pad. These values will continue to be accurate with the proposed expansion. See Supplement ER Section 4.15.12. Given the conservative assumptions used in estimating these values, these concentrations and resulting dose equivalents are insignificant and their potential impacts on the environment and health are inconsequential.

These dose equivalents due to normal operations are small fractions of the normal background radiation range of 2.0 to 3.0 mSv (200 to 300 mrem) dose equivalent that an average individual receives in the US, and within regulatory limits.

7.2.15 Other Impacts of Plant Operation

UUSA water will be obtained from the Eunice, New Mexico municipal water system, and routine liquid effluent will be treated and discharged to evaporative pond(s), whereas sanitary wastes will be sent to the City of Eunice Wastewater Treatment Plant via a system of lift stations and 8 inch sewage lines. Facility water requirements are relatively low and well within the capacity of the Eunice water utility. The current capacity for the Eunice Potable water supply system is being met and is currently less than what was initially estimated in the initial LES ER. Non-hazardous and non-radioactive solid waste will be shipped offsite to a licensed landfill. The local Lea County landfill capacity is more than adequate to accept the non-hazardous waste.

7.2.16 Decommissioning

The plan for decommissioning is to decontaminate or remove all materials promptly from the site that prevent release of the facility for unrestricted use. This approach avoids the need for long-term storage and monitoring of wastes on site. Only building shells and the site infrastructure will remain. All remaining facilities, including site basins, will be decontaminated where needed to acceptable levels for unrestricted use. Excavations and berms will be leveled to restore the land to a natural contour.

Depleted UF_6, if not already sold or otherwise disposed of prior to decommissioning, will be disposed of in accordance with regulatory requirements. Radioactive wastes will be disposed of in licensed low-level radioactive waste disposal sites. Hazardous wastes will be treated or disposed of in licensed hazardous waste facilities. Neither conversion (if done), nor disposal of radioactive or hazardous material will occur at the plant site, but at licensed facilities located elsewhere.

Following decommissioning, all parts of the plant and site will be unrestricted to any specific type of use.

7.2.17 Section 7.2 Tables

Table 7.2-1 Qualitative Environmental Costs/Benefits of UUSA During Initial Construction/Operation and for Expansion

Qualitative Costs	Initial Construction/Operation	Expansion
Change in real estate values in areas/communities adjacent to the facility (e.g., land, homes, rental property etc.)	Potentially inflationary	No change from initial construction/operation
Traffic changes along local streets and highways	Some increases during shift changes	No change from initial construction/operation
Demand on local services, public utilities, schools, etc.	Some increased utilization expected, but within services capacity	No change from initial construction/operation
Impact to natural environmental components (e.g., ecology, water quality, air quality, etc.)	Minimal impacts	Minimal impacts
Alteration of aesthetic, scenic, historic, or archaeological areas or values	No measurable impact	No change from initial construction/operation
Change in local recreational potential	Not significant	No change from initial construction/operation
Qualitative Benefits		
Site soil stabilization and erosion reduction	Beneficial	No change from initial construction/operation
Incentive for development of other ancillary/support business development resulting from presence of LES facility	Beneficial	No change from initial construction/operation
Change in real estate values in areas/communities adjacent to the facility (e.g., land, homes, rental property etc.)	Potentially beneficial	No change from initial construction/operation
Increase in local employment opportunities	Beneficial	Little change from initial construction/operation
Impacts to local retail trade and services	Beneficial	Little change from initial construction/operation
Development of local workforce capabilities	Beneficial	Little change from initial construction/operation

7.3 No-Action Alternative Cost-Benefit

The no-action alternative would be to not increase capacity at UUSA. Under the no-action alternative, the NRC would deny the license amendment request for the plant, in which case the proposed site would continue to produce approximately 3.0 MSWU per year. Although the no-action alternative would avoid additional impacts to the area (except for the pre-construction and construction-at-risk activities described in Supplemental ER Sections 1.3.5 and 1.3.6 respectively, which will occur prior to when such a decision is made), it could lead to impacts at other locations.

Under the no-action alternative, for example, reactor licensees would still need uranium enrichment services. Many U.S. operators of nuclear power plants in the U.S., who are also the end users of uranium enrichment services in the U.S., view the present supply situation with concern. They see a world supply and requirements situation for economical uranium enrichment services that is presently in balance, exhibiting a potential for significant shortfall if plans that have been announced by some of the primary enrichers are not executed.

Not expanding the capacity at UUSA, therefore, could have the following consequences:

- The inability to meet important considerations of energy and national security policy, namely the need for the development of additional, secure, reliable, and economical domestic enrichment capacity.
- Continued reliance on the high-cost, power-intensive, and inefficient technology now in use at the aging Paducah gaseous diffusion plant, or, alternatively, reliance on the proposed ACP gas centrifuge technology that, at present, is still under development and has yet to be deployed on a commercial scale.
- Continued extensive reliance on uranium enriched in foreign countries.
- Dependence on other plants that have not yet been constructed (i.e., Eagle Rock and GLE).
- A possible uranium enrichment supply deficit with respect to the uranium enrichment requirements forecasts.

Supplemental ER Section 2.3, Comparison of the Predictive Environmental Impacts, describes the environmental impacts of the no-action alternatives and compares them to the proposed action. Table 2.3-1, Comparison of Potential Impacts for the Proposed Action and the No-Action Alternatives and Table 2.3-2, Comparison of Environmental Impacts for the Proposed Action and the No-Action Alternatives, summarize that comparison in tabular form for the 13 environmental categories, described in detail in Supplemental ER Chapter 4, Environmental Impacts. In sum, UUSA anticipates that many of the No-Action Scenarios fail to meet the purpose and need, and those that do meet the purpose and need will have effects to the environment greater than the proposed action.

The same types of impacts identified in the initial LES ER would be avoided in the Lea County area by the no-action alternative (*see* LES ER Table 7.2-1, Qualitative Environmental Costs/Benefits of NEF During Construction and Operation). For example, the no-action alternative would avoid the potential, short-term impacts of soil erosion and fugitive emissions from dust and construction equipment; disruption to ecological habitats; noise from equipment; and traffic from worker transportation and supply deliveries that may occur during construction of the facility expansion. These impacts, as discussed in Chapter 4, are temporary and limited in scope due to construction BMPs. During operation, the no-action alternative would avoid increased traffic due to feed/product deliveries and shipments and worker transportation;

increased demand on utility and waste services; and public and occupational exposure from effluent releases. These impacts, however, will be minimal because the area already has traffic from a nearby city and general trucking commerce; there is sufficient capacity of utility and waste services in the region; and effluent releases will be strictly controlled, maintained onsite, monitored, and maintained below regulatory limits.

While the no-action alternative would have no impact on the socioeconomic structure of the Lea County area, the proposed action would continue the moderate to significant beneficial socioeconomics effects created by the initial construction (*see* Supplemental ER Section 4.10). In the initial ER, UUSA estimated that contractor payroll would total $122.2 million with an additional $21 million expended for employment benefits over the 8-year construction period, and that contractor services purchased from third party firms within the region would add $265 million in direct benefits to the local economy during the UUSA construction. By continuing the expansion, construction benefits to the local economy would continue.

Based on the above information, the socioeconomic benefits of the expansion described in Section 4.10, Socioeconomic Impacts, and Section 7.2, Environmental Cost-Benefit, Plant Construction and Operation, and the minimal impacts to the affected environment demonstrated in Chapter 4, UUSA has concluded that the preferred alternative is the proposed action of a capacity expansion to 10 MSWU.

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Enclosure 3
Environmental Report Revision 5 as a single document (CD)

Enclosure 4
Environmental Report Revision 20f with changes from Revision 5 (CD)