

**U.S. Nuclear Regulatory Commission
Requests for Additional Information
Uranium One's Ludeman Project
Environmental Review of the License Application
for a Source Material License**

The purpose of the following Requests for Additional Information (RAIs) is to provide the additional information and data that are necessary for the U.S. Nuclear Regulatory Commission (NRC) to fulfill the requirements of Title 10 of the *Code of Federal Regulations*, Part 51 (10 CFR 51). Part 51 requires compliance with the procedures specified in Section 102(2) of the National Environmental Policy Act for a complete, interdisciplinary evaluation of the potential environmental impacts of the Proposed Action and Alternatives. These RAIs were developed during the NRC staff's review of Uranium One's (the "Applicant") *Environmental Report* (ER) and *Technical Report* (TR), which were submitted to the NRC as part of the license amendment application. (Agencywide Documents and Management System (ADAMS) Accession No. ML120120182). The information in these documents was compared to the information required by the NRC staff to develop a sound and defensible Environmental Assessment (EA). Additional information that the NRC requires is requested below in the following RAIs.

General

RAI GEN-1

Please provide plan views of each of the proposed Satellite areas which show the baseline conditions and features for each phase of the Ludeman Project.

- A. Please provide a current, baseline plan view of each of the proposed Satellite, showing each of the physical (i.e., man-made) attributes listed below:
- buildings and other structures
 - above- and below-ground electrical lines and poles (and other lines, such as telephone, if present)
 - above- and under-ground pipes and pipelines as well as their arrangement and related support structures
 - above- and below-ground tanks
 - storm-water management features such as collection drains and pipes to the sediment surface impoundment
 - surface impoundments used for management of liquid byproduct waste
 - all active water wells, outlines of wellfields, outlines of monitoring-well rings, and header houses
 - existing and planned structures unrelated to the Proposed Action, such as pipelines and wells associated with oil and gas production
 - site improvements such as paved and unpaved roads
- B. Please provide a plan view of the Project areas with the same scale and size as the baseline plan view requested above and indicate each of the physical (i.e., man-made) attributes listed above for each phase (i.e., construction, operation, aquifer restoration, and decommissioning) of each of the proposed Satellite areas.

Please provide these plan-view figures in an electronic format with similar features to Figure 2.1-2 in the ER, including enlargement of the Satellite areas to allow the details to be discernible. The views of the existing, current Ludeman site will serve as a baseline view and the other phased views will assist in the NRC's description of the Proposed Action and the Alternatives in Section 2 of the EA and in its evaluation of the impacts of the Ludeman Project for each phase. Specifically, comparable figures of each Satellite area are necessary to evaluate the impacts of the NRC's Alternative 3 and to compare impacts among the three Alternatives chosen by the NRC for further analysis (i.e., Alternative 1: Proposed Action, Alternative 2: No-Action Alternative, and Alternative 3: Leuenberger Satellite Eliminated from Proposed Action).

RAI GEN-2

Please update the status of Uranium One's permitting and licensing activities for the Ludeman Project that is summarized in Table 1-1 of Section 1.13 in the ER, pages 1-30 and 1-31.

Following the submission of Uranium One's license application to the NRC, the Applicant has likely continued to prepare, submit, and receive approval on license and permit applications. An updated Table 1-1 will be used in the development of the EA for the Ludeman Project to incorporate the current information on environmental approvals and permits.

RAI GEN-3

Please note any changes to the order of development of the Satellite areas that is shown in Figure 1-4 of the TR.

Final information on the schedule for the four Project phases at each Satellite will support the NRC's environmental impact analysis in the EA.

RAI GEN-4

Please provide the documents cited in the ER and TR that are not publicly available, i.e., documents pertaining to exploration, licensing, and permitting activities in the early 1980s for areas within the Ludeman Project. This request includes the following documents which are cited in the ER and TR:

- Arizona Public Service Company (APS), 1980. Application for In Situ Research and Development Testing License, Peterson In Situ Uranium Extraction Project, Converse County, Wyoming. Wyoming Department of Environmental Quality (WDEQ) Application for In Situ Research and Development Testing License.
- COGEMA Mining, Inc., 2004. *Wellfield Restoration Report, Irigaray Mine*, prepared by Petrotek Engineering Corporation.
- Cogema Mining, Inc., 2008. Wellfield Restoration Report Christensen Ranch Project Wyoming, March 2008.
- W.E. Galloway and Walton, A.W., 1974. Stratigraphy of the Upper Fort Union Fluvial System, Southern Powder River Basin Relationships to Uranium Mineralization, Technical Service Report No. 1201-6-1-74, Conoco, Inc., November 1974.

- Geomatrix Consultants, Inc., 1988. *Seismotectonic Evaluation of the Wyoming Basin Geomorphic Province*, prepared for the U.S. Bureau of Reclamation, Contract No. 6-CS-81-07310.
- Jim Lemmers and Smith, Dave, 1981. *Idaho Claims Geologic Evaluation, Powder River Basin, Converse County, Wyoming*, UNC Teton Exploration Drilling, Inc., February 20, 1981.
- UNC Teton Exploration Drilling, Inc., 1983. *Leuenberger In-Situ Pilot Project, M Zone Restoration Stability Report*, Converse County, Wyoming, Permit No. 2RD-522, March 18, 1983.
- Teton-Nedco Joint Venture, 1980. *In-Situ Mining Permit Application*, Leuenberger Site, Converse County, Wyoming.
- Uranium Resources Inc., 1981. North Platte Project Application and Technical Report.
- WDEQ, Land Quality Division (LQD), 2000. Memorandum from Roberta Hoy, WDEQ/LQD to Richard Chancellor, Administrator, WDEQ/LQD, TFN 321197, August 7, 2000.
- Conoco, 1982, as cited in the Ludeman ER Section 3.3.3.

NRC's preparation of the EA requires verification of key information. Additionally, impact analyses must consider past, present, and reasonably foreseeable future events within the designated geographic area. Review of the documents cited in the ER and TR that pertain to uranium recovery projects under development in the 1980s and to groundwater restoration at other in situ uranium recovery (ISR) projects within the Powder River Basin will ensure that the EA accurately describes the environmental setting as well as the environmental and cumulative impacts of the Ludeman Project.

Facility Design

RAI FD-1

Please describe any additional facility design attributes and specifications that have been developed since the submission of the license application.

- A. Please provide additional design attributes and specifications for the structures that would be constructed at each of the Satellite areas.
- B. Please provide information on the topographic setting where each facility and wellfield would be constructed at every Satellite area and how the design would accommodate the topography.
- C. Please provide additional information on the final design specifications of the surface impoundments (i.e., ponds) that would be constructed at each Satellite facility, including the design for connectivity (i.e., pipelines) between the surface impoundments at the different Satellite areas and the deep-injection wells.

Any additional available information regarding the facility design, both interior and exterior, at each Satellite area will assist the NRC during its assessment of the environmental impacts of the Proposed Action. Specifically, more detailed facility design than that shown on Figures 3-3 and 3-4 of the TR is needed for each Satellite. In addition, the number of surface

impoundments at each Satellite must be clarified and the design of the impoundments finalized. Section 4.2.4.5 of the TR notes that the design presented in Addendum 4-A is preliminary and that an “inclusive surge pond design has not been completed.” In addition, Addendum 4-A of the TR notes that the second and third Satellite areas could require only one surface impoundment as the impoundments at the other Satellite areas could be used for redundancy. Final information on the overall design of Satellite areas will support the NRC’s environmental impact analysis.

RAI FD-2

Please describe the equipment and containment structures used for the resin-transfer process.

Sections 3.2.1 and 4.1.2 of the TR note that a resin-transfer process would be used to move the uranium-loaded resins from the ion-exchange columns to a truck for transport to the Willow Creek Central Processing Plant (CPP). A description of the associated equipment and containment structures is necessary for the NRC to describe the Proposed Action in Section 2 of the EA and to consider mitigation measures in its evaluation of health and safety impacts. This information will support the analysis of these impacts.

RAI FD-3

Please provide the design details of a typical header house and wellhead enclosure at a Satellite wellfield.

Information on wellfield structures is necessary for the NRC to evaluate impacts to the underlying soils and to visual and cultural resources. Section 3.1.5 of the TR provides dimensions of the header houses and the number of header houses planned for each Satellite. Section 3.3.1 of the TR refers to “basements” of header houses, but no design information is provided. Section 4.1.2.1 of the TR notes that wellhead enclosures may be vented to reduce radon buildup; however, no information is provided regarding the vents’ design. More detailed design information than is provided in Section 5.1 of the ER on the dimensions of wellhead structures, as well as the number of structures at each Satellite, are necessary for the NRC to assess related impacts. Complete information on the design of these structures will support the NRC’s impact analysis.

RAI FD-4

Please provide the water balance for each Project phase at each Satellite facility.

- A. Please modify Figure 3-6 of the TR to include reverse-osmosis treatment of bleed water and the flows of permeate and brine as components of the overall water balance.
- B. Please address the potential for and volume of excess permeate during the first two years of operation before groundwater restoration begins (shown in Figure 1-4 of the ER) and clarify the proposed disposal method of this waste stream.

Section 3.1.6.1 of the TR describes the water balance as including injection, recovery, bleed, and process water as well as the respective treatments. The water balance is necessary to evaluate impacts of consumptive use of ground water and the impacts of the management of liquid byproduct wastes. The differences in the water balance among the Satellite areas and

during the phases of the Project (construction, operations, restoration, and decommissioning) are not provided by Figures 3-7 and 3-8 and Section 3.1 of the TR. Quantitative data on the water balance will support the NRC's environmental impact analysis.

Cumulative Impacts

RAI CI-1

Please provide additional information on the cumulative-impact analysis contained in Section 4.14 of the ER.

- A. Please state explicitly the geographic and temporal parameters used to develop the scope of the cumulative-impact assessment.
- B. Please define the geographic boundaries of the areas that were used in ER Section 4.14 for each resource area to assess the respective cumulative impacts, and please explain why these areas were selected. Explain how these choices compare with the criteria from Section 5 and Appendix F of the Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities (GEIS) (NUREG-1910 Volume 2, ADAMS Accession No. ML091480188).
- C. Please identify and describe reasonably foreseeable future actions (RFFA) that could potentially contribute to the impacts of the proposed Ludeman Project in addition to available information regarding the schedule for development of identified actions.
- D. Please provide quantitative information about each past, present, and reasonably foreseeable action that was used by Uranium One to assess cumulative impacts for each resource area. For example, the volume of waste disposed of by deep-well injection at other ISR facilities located within a defined geographic area must be clarified so that a comparison of the volume projected to be disposed of at the Ludeman Project can be made. For transportation, the traffic to and from other present projects and RFFA within the transportation cumulative-impact geographic area must be quantified. This will allow comparison of the Project's baseline conditions with any traffic increases as a result of the Ludeman Project.

In order for the NRC to assess the cumulative impacts of past, present, and RFFA under Section 5 of the GEIS, the geographic boundaries (i.e., scope) of each area must be explicitly established for every resource area as noted in Step 2 of the 11-step process established by the Council on Environmental Quality and included as Appendix F to the GEIS. A discussion of RFFA must be included in all cumulative-impact analyses. Analyses of cumulative impacts must be based upon, to the extent possible, quantitative comparisons between the projected impacts from the Ludeman Project and the cumulative impacts of other actions in the defined geographic and temporal scope for each resource area. Additional detail on the impacts of these actions will assist in the NRC's environmental impact analysis.

RAI CI-2

Please incorporate the increase in production at the Smith Ranch Project (including Satellite areas) that would result from the renewal of Cameco's license SUA-1548 (the application was submitted to the NRC in February 2012) into the assessment of cumulative impacts.

Cameco's license-renewal application proposes uranium-production increases at the Highland Central Processing Plant and increases in the flow rates at the Gas Hills, North Butte and the Reynolds Ranch Satellites. These increases could result in resource-area cumulative impacts. Additional detail on impacts from these actions will assist in the NRC's environmental impact analysis.

Land Use

RAI LU-1

Please clarify the location and use of recreational lands within the Ludeman Project and the surrounding area.

- A. Please provide a map showing the location of recreational areas and trails (e.g., the Child's Cutoff Trail) on the Ludeman Project and in the surrounding area.
- B. Please specify whether hunting occurs on Federal or State lands within the Project boundaries.
- C. Please discuss the impacts to recreational areas from the proposed Ludeman Project.

Section 3.1.2 of the ER lists, but does not map, the location of recreational lands, with the exception of the Bozeman Trail. The ER also identifies U.S. Bureau of Land Management (BLM) and State of Wyoming lands located within the Ludeman Project area, but it does not identify whether hunting presently occurs on these lands. This information is needed for the NRC to accurately characterize existing land uses in the area and to determine whether the proposed Project would significantly interfere with or limit access to recreation.

RAI LU-2

Please clarify the total areas that would be disturbed by proposed Project facilities, wellfields, and roads associated with each Satellite.

- A. Please clarify the amount of land that would be disturbed by each Satellite facility and its associated wellfields.
- B. Please clarify the correct width and length of each access road on the Ludeman Project and within the two-mile buffer zone, as well as the areas disturbed by each road at each Satellite.
- C. Please clarify whether fences are included as part of the acreage of the disturbed areas or provide the areas of disturbance for the fences at each Satellite.

The ER contains discrepancies (noted in the table below) in the road widths and the area of disturbance associated with the various Project facilities and wellfields. In addition, it is not clear what is included in various calculations of disturbance (e.g., infrastructure, wellfields, fences, surface impoundments) or whether disturbed area includes all of the acreage within a fenced area or just some part of it.

Discrepancies Regarding the Infrastructure Footprints in the ER and TR		
Section 4.9 of the ER	Section 2.4.2.5 of the TR	Section 5.1 of the ER
80- x 140-square-foot processing building	80- x 160-square-foot processing building	80- x 160-square-foot processing building and a 60- x 150-square-foot shop and laboratory complex
Other infrastructure within an approximate 1.5-acre area enclosed with security fencing	Other infrastructure within an approximate 2-acre area enclosed with security fencing	Other approximate 1.5 acre area enclosed with security fencing
Road disturbance acreage is calculated assuming approximately 7 miles of 25-foot-wide main road and approximately 18 miles of 8-foot-wide field roads.	Road disturbance acreage is calculated assuming approximately 7 miles of 25-foot-wide main road and approximately 18 miles of 8-foot-wide, 2-track field roads.	Road disturbance acreage is calculated assuming approximately 6 miles of 25-foot-wide main road and approximately 26 miles of 8-foot-wide, 2-track field roads.
Section 4.1 of the ER	Section 3.2.1.1 of the TR	
Disturbance associated with "satellite facilities" is noted as 15 acres plus 3.5 acres for 2 surge surface impoundments	Construction of the 3 Satellite facilities, associated structures and wellfield header houses will encompass approximately 160 acres.	

Resources that could be impacted by land disturbances include land use, soils, ecology, visual resources, cultural resources, and air quality as well as public and occupational health and safety. An accurate description of all Project-related land disturbances is needed for the NRC to accurately identify and evaluate potential direct and cumulative impacts that could result from the proposed Ludeman Project.

RAI LU-3

Please clarify the description of past, existing, and proposed energy projects in the vicinity of the Ludeman Project area.

- A. Please identify any renewable energy facilities (e.g., wind farms) in the vicinity of the Project area.
- B. Please identify past, existing, proposed, and/or pending oil and gas operations in the Project vicinity.

A complete identification of past, present, and RFFA related to energy development in the vicinity of the Ludeman Project area is needed by the NRC to accurately characterize nearby land use, to evaluate potential impacts from the Ludeman Project, and to assess cumulative impacts. For example, based on an examination of Converse County maps and land-use information, two existing wind farms are located northwest of Glenrock, and two wind farms were recently proposed (2011) southwest of Glenrock. In addition, the Powder River Basin has a history of oil and gas production, and hydrofracking of the Niobrara Formation within the Ludeman Project has recently been implemented. The energy activities described should include exploration, production, and transportation to provide a complete picture of energy-related land use in the vicinity surrounding the Project.

RAI LU-4

Please clarify the number of residences in the Negley Subdivision.

The presence of the Negley residential subdivision, which is contiguous to the northwest Project boundary and is located within the two-mile buffer zone, is not mentioned in the description of land use or in the evaluation of impacts presented in Section 4.1 of the ER. Although the locations of residences are mapped on Figure 3.1-2, the number of actual residences is not identified. The report entitled *Assessment of the Hydraulic Relationship of the Negley Subdivision to the Ludeman ISR Uranium Project* indicates that the Subdivision consists of approximately 30 individual landowners and notes the presence of 22 wells, but it does not specify the number of residences. The number of residences is needed for the NRC to accurately characterize existing, adjacent land use and to evaluate potential impacts to residential lands.

RAI LU-5

Please provide detail on the number of acres to be taken out of agricultural production.

- A. Please provide the number of acres that would be taken out of agricultural production for each Satellite facility and its associated wellfields for each of the four Project phases.
- B. Please describe the locations within the Ludeman Project where agricultural land would be removed from production.

Table 2-2 of the ER states up to eight acres would be taken out of agricultural production (i.e., livestock grazing) under the Proposed Action, but no detail is provided. Information on changes in land use is necessary to accurately assess impacts to land use, socioeconomics, and cultural resources.

Transportation

RAI TR-1

- A. Please provide additional information regarding the design of the primary access roads (e.g., pavement widths, design-basis speeds, current conditions, and current uses), other than State highways.
- B. Please provide information regarding the entity that currently maintains each of these roads (e.g., the county or private landowner) and traffic count data for all of the roads that would be used as the primary access route.

Section 3.2.1 of the ER includes a statement that county and local roads would be used to access the Ludeman Project. Section 2.1.2 of the TR references paved roads used as access to different portions of the Ludeman Project. Information is provided about State highways; however, additional information is needed regarding the other public roads that would be used for the Ludeman Project in order for the NRC to evaluate impacts to the road system and to other resources due to proposed changes to the road system.

RAI TR-2

Please explain the traffic-count data for State Highway 95 in the vicinity of the Ludeman Project area.

The TR and ER appear to cite conflicting traffic data for the two State roads that would be used to access the Ludeman Project area, as shown in the table below. Existing traffic data is required to evaluate potential impacts to area roads resulting from Ludeman Project-related traffic.

Road	Annual Average Daily Traffic Count	Section/Page	Report
Highway 95 near Rolling Hills	1,810	2.2.2.3/2.2-10	TR
Highway 95 between Glenrock and Highway 93	50	4.2.2/4-2	ER
Highway 95 and County Road 26	260	4.2.2/4-2	ER

RAI TR-3

Please provide additional information on anticipated traffic counts during each phase of the Project for every Satellite.

Transportation impacts must be evaluated for each phase of the Ludeman Project at each Satellite. Therefore, the estimated number of trips made by employees and trips for shipments and deliveries are required for each of the four Project phases (i.e., construction, operation, aquifer restoration, and decommissioning). For each of the phases at each Satellite, please provide the number of workers commuting to the Satellite each day; the number of supply or other deliveries; and the anticipated number of loaded-resin, byproduct material, solid-waste, and other shipments. This data is necessary for the NRC to evaluate potential impacts to the roads that would be used by Project-related traffic.

RAI TR-4

Please provide additional information on shipments of uranium-loaded resins, barren-eluted resins, and yellowcake to/from the Willow Creek CPP.

- A. Please provide traffic-count data along the proposed transportation route to Willow Creek.
- B. Please provide the current frequency of shipments (uranium-loaded resins, barren-eluted resins, and yellowcake) to and from Willow Creek.
- C. Please quantify the anticipated increase in yellowcake shipments from Willow Creek as a result of the Ludeman Project.

Shipments to the Willow Creek CPP would use several State and local roads. In order for the NRC to evaluate the potential impacts to these roads, additional information is needed. This information is required for an evaluation of potential impacts to these roads.

Geology and Soils

RAI Geology-1

Please provide information on the potential for seismicity induced by the deep-well injection of waste water proposed for the Ludeman Project.

In some areas of the United States, seismicity has been induced in response to the deep injection of waste waters or other fluids, due to fractures in weak rock and/or lubrication of existing faults. The potential for seismicity due to the operations proposed for the Ludeman Project is not addressed in Section 4.3.1 of the ER. If induced seismicity is not probable due to the nature of the geologic setting or the proposed operating methods, this improbability should be reported and explained. This information is necessary for the NRC to evaluate the potential geologic impacts of the Ludeman Project.

RAI Soil-1

Please describe the measures that would be implemented to mitigate impacts to soils from construction activities and other soil disturbances during the four Project phases.

Section 4.3.2 of the ER states that the soils at the proposed Satellite facilities have a severe potential for wind erosion and that the soils in the proposed wellfields have a moderate-to-severe risk of erosion from both water and wind. Additionally, this section of the ER states that soil-erosion mitigation would be conducted in accordance with applicable WDEQ/LQD rules, and then it discusses typical erosion-protection measures that could be implemented at the Ludeman Project. It is not clear what specific measures Uranium One intends to implement that would mitigate potential soil erosion related to the Proposed Action. A description of the specific mitigation measures is required for the NRC to assess the mitigation of potential impacts in the EA.

Water Resources

RAI WR-1

Please provide additional information on the isopach maps of the sand and shale units under the Ludeman Project area.

- A. Please extend the isopach maps to include the area between the southern Project boundary and the North Platte River.
- B. Please add outlines of all ore bodies on the isopach maps and identify the production sand unit for each ore body.

Uranium recovery operations at the Leuenberger Satellite could potentially affect the wells in the Negley Subdivision and operations at the Peterson Satellite could potentially affect the North Platte River. The requested revisions to the isopach maps will allow the NRC to evaluate the potential impacts of uranium recovery operations at the Leuenberger and Peterson Satellites on adjacent areas (i.e., the Negley Subdivision and the North Platte River).

RAI WR-2

Please identify the sand unit within which the production zone would be located for each wellfield at every Satellite.

The ER refers frequently to the “70, 80, and 90 sand” production zones, but it does not identify the respective sand units that would be developed in each of the individual wellfields in each Satellite area. This information will assist in the NRC’s evaluation of the potential impacts of uranium recovery operations at each Project Satellite on adjacent areas.

RAI WR-3

Please provide an assessment of the long-term drawdown in the 70, 80, 90, 100, 110, and 120 sands that would result from Uranium One’s development of the three wellfields at the Leuenberger Satellite and Wellfield 2 at the Peterson Satellite (as shown on ER Figure 1-6).

Section 3.4.2.4.1 of the ER discusses historical aquifer tests and Section 3.4.2.4.2 discusses the 2008 pump tests that were conducted by Uranium One to evaluate the hydraulic connection between the sand units at the Satellite areas. These tests, however, were of less than one week in duration and do not necessarily represent the hydraulic conditions that would be present during long-term pumping of the aquifers for uranium recovery. Projections of the effects of long-term uranium recovery on the sand units at the Leuenberger Satellite and Peterson Wellfield 2, as well as the surrounding areas, are necessary for the NRC to evaluate the potential impacts to nearby wells in the Negley Subdivision and the North Platte River. The projection of drawdown must explicitly address the connectivity between the sand units.

RAI WR-4

Please provide a potentiometric surface map for the 100 and 110 sands in the Leuenberger Satellite/Negley Subdivision area that is based on sufficient potentiometric data to provide a reliable evaluation of the potentiometric surface and groundwater flow direction in these units.

Many of the wells in the Negley Subdivision are screened in the 100 and 110 sand units. These sands are above the production-zone sands identified at the Leuenberger Satellite; therefore, the current potentiometric surface of these two sand units is needed to assess groundwater impacts on the Negley Subdivision. The potentiometric-surface maps for the 100 sand shown as Figures 3.4-16 and 3.4-17 in Section 3.4 of the ER are based upon data from three wells. The map for the 110 sand is based upon data from two wells. These data are not sufficient to construct potentiometric-surface maps for this area. More accurate maps of these sand units are necessary for the NRC to evaluate potential groundwater impacts from the Leuenberger Satellite on nearby wells.

RAI WR-5

Please provide additional information regarding water use during all four Project phases at each of the proposed Satellites areas.

- A. Please provide the consumptive use of ground water in gallons per day, or in an equivalent measure, for each of the four Project phases at each Satellite area.

- B. Please estimate the volumes of non-production water (e.g., domestic consumption, dust control, and crop irrigation) that would be used during each of the four Project phases at each of the Satellite areas.
- C. Please identify the source(s) of the volumes of water estimated above in B., including the location(s) of the source(s) and targeted aquifer zone if ground water would be used.

Section 2.2.3 of the TR describes existing uses of ground and surface waters within the Project area and the two-mile buffer zone. In addition, non-production water uses, such as domestic consumption and dust control, must be evaluated. These uses could vary during the different phases of the Proposed Action, and they could depend upon other factors, such as the size of the Satellite's workforce or seasonal dust-control requirements. Information regarding water use is necessary for the NRC to evaluate potential water-resource impacts.

RAI WR-6

Please clarify the measures that would be implemented to mitigate impacts from consumptive groundwater use by the Ludeman Project.

Section 5.4.2 of the ER describes potential impacts on ground water outside the Ludeman Project area due to consumptive use. In Section 5.4.2.1.2 of the ER, Uranium One identifies three mitigation measures that "would be considered" if water levels drop in affected non-Project-related wells. In order for measures to be considered in the EA as mitigating and reducing impacts, Uranium One must commit to implementing the measures. Specific information on mitigation measures committed to by Uranium One will support the environmental impact analysis of water resources.

RAI WR-7

Please provide information to verify that historical exploration drillholes have been located and properly abandoned.

Section 2.4.1.3 of the GEIS notes "improperly abandoned exploration drillholes" can cause an excursion of lixiviant from the production zone. Section 1.3 of the ER discusses exploration and aquifer testing that occurred in the Ludeman Project area during the late 1970s and early 1980s. If the drillholes from these activities were not properly plugged, this could increase the potential for vertical excursions that could impact water quality in adjacent aquifers. A discussion of the abandonment of these drillholes will support the environmental impact analysis in the EA.

RAI WR-8

Please provide additional information on the storm-water management approaches and proposed storm-water management infrastructure for each Satellite area.

- A. Please provide a general description of the storm-water management approaches (e.g., infiltration, evaporation, detention, or dispersion) that would be implemented at each of the Satellite areas.
- B. Please provide a figure illustrating the anticipated layout of each Satellite area, including proposed waste-management surface impoundments, other storm-water-management infrastructure, and any surface-water drainages to which this infrastructure discharges.

As described in Section 4.1 of the ER, each Satellite area would disturb approximately 1.5 acres, much of which would be for the construction of buildings and paved areas. Runoff from the impervious surfaces associated with these facilities could increase erosion or otherwise affect nearby ephemeral drainages. The NRC requires this information on the proposed storm-water-management techniques to assess the potential environmental impacts from storm-water runoff.

RAI WR-9

Please discuss the rationale for Uranium One's analyses of some chemical constituents in filtered-water samples and some analyses of unfiltered samples. Please provide this information for all water-quality data reported and referenced in the ER and for the proposed groundwater and surface-water monitoring plans and protocols.

The reporting of water-quality constituents as dissolved or total concentrations is a key aspect in the evaluation of water quality. The selection of analytical methods would be based upon regulations, rules, and guidance from the NRC, U.S. Environmental Protection Agency, and the WDEQ. A description of the rationale for chemical analyses of filtered or unfiltered samples is needed by the NRC to evaluate the water-quality data presented in the ER. This information will support the environmental impact analysis of water resources.

Ecology

RAI ECO-1

Please provide additional details regarding mitigation measures to minimize impacts to birds.

Birds specified in the Migratory Bird Species of Management Concern in Wyoming list that were observed on the Ludeman Project are summarized in Table 3.5-21 of Addendum 3.5-K of the ER. Section 5.5 of the ER describes measures that would be used to mitigate impacts to the habitat, nesting, and roosting of protected birds; however, it does not address the potential impacts to birds from the surface impoundments. If the design of the impoundments includes elements that would mitigate impacts to birds, please describe them. This information will support the NRC's environmental impact analysis of ecological resources.

Meteorology and Air Quality

RAI AQ-1

Please provide additional information on projected air emissions.

- A. Please provide the calculations that led to the conclusion that 15.5 tons of particulate matter <10 microns (PM₁₀) per year would be expected to be emitted from the Ludeman Project.
- B. Please provide information on projected emissions for each phase of the Project (i.e., construction, operation, aquifer restoration, and decommissioning).
- C. In the discussion of projected air emissions, please include other pollutants of concern, such as nitrogen oxides (NO_x), carbon monoxide (CO), sulfur dioxide (SO₂), volatile organic compounds (VOC), ozone (O₃), and particulate matter less than 2.5 microns in diameter (PM_{2.5}).

Sections 3.6 and 4.6 of the ER provide the estimate of 15.5 tons of PM₁₀ emissions resulting from vehicle traffic associated with the proposed Ludeman Project. These estimates are likely calculated based on expected Project activities as well as the emissions factors provided by the WDEQ; however, no detail is provided on the calculations. There is an apparent discrepancy between the 18.5 tons of PM₁₀ per year that is given in Section 3.6.3.6 of the ER and the 15.5 tons of PM₁₀ per year in Section 4.6 of the ER; please resolve this discrepancy. In addition, the ER does not provide separate estimates of air emissions from each Satellite area during each phase of the Project. Estimates for all emissions are necessary for the NRC to evaluate potential impacts to air quality from the Proposed Action and the Alternatives.

RAI AQ-2

Please justify the conclusions that air-quality impacts would be insignificant.

- A. Please provide a reference for the statement made in Section 3.6.3.6 of the ER, “Atmospheric dispersion modeling typically shows that fugitive PM₁₀ emissions on the order of 15 tons per year results in insignificant impacts to ambient air quality beyond a distance of a few hundred yards from the sources.”
- B. Please provide information on the distance and direction of any nearby Class I areas from the proposed Ludeman Project and provide an assessment of impacts for prevention of significant deterioration (PSD), visibility, and atmospheric deposition to each of the Class I areas.

Section 3.6.3.6 of the ER concludes that emissions on the order projected to be emitted at the Ludeman Project are insignificant; however, no reference or rationale for this conclusion is provided. In addition, Section 3.6.3.6 notes that the Thunder Basin National Grasslands is a Class I area in proximity to the proposed Ludeman Project; however, the impacts to that Class I area from the proposed Project are not addressed. Neither the distance nor the direction from the proposed Project to Class I area(s) are given. The determination of the air-quality impacts at the Project and in the vicinity is necessary to complete the EA.

RAI AQ-3

Please provide additional information regarding the specific mitigation measures to be used by Uranium One to control fugitive dust at the Ludeman Project site during each phase of the Proposed Action.

- A. Please provide a technical basis for the following statements made in Section 4.6 of the ER:
 - “Construction activities ... will cause minimal short-term impacts on local air quality.”
 - “The application of water to unpaved roads will reduce the amount of fugitive dust to levels equal to or less than the existing condition.”
 - “as periodic watering or chemical treatment of the unpaved roads will reduce emission factors by half or more.”
- B. Please identify the fugitive-dust levels that would trigger the implementation of control measures cited in Section 5.6 of the ER.

- C. Please discuss how fugitive dust would be monitored (i.e., does Uranium One intend to use observation or real-time particulate monitoring)?
- D. Please describe how measured dust concentrations would be compared to on-going land disturbances.
- E. Please specify the speed limits, water-application frequencies, dust suppressants, and road-surface types that would be used to minimize fugitive-dust emissions.

Dust-suppression methodologies that would be used in the disturbed areas of the Ludeman Project during all Project phases should be specified. The success of dust-suppression measures directly affects air-quality impacts. In order for the NRC to assess air-quality impacts, additional information is required regarding the implementation and the associated performance of dust-control measures.

RAI AQ-4

Please provide additional information on the meteorological data described in Section 3.6 of the ER.

- A. Please confirm that the 2005 and 2007 data described in Section 3.6.1 are the best available data to characterize the meteorological conditions at the Ludeman Project or update the data with the most current information. Also, please include a map identifying the locations of monitoring stations relative to the Project area.
- B. Newcastle is listed in Table 3.6-1 of the ER as one of the meteorological stations included in the climate-change analysis. Please address the absence of data for Newcastle in the text and subsequent figures.

The use of complete and best-available data is required for the NRC to characterize pre-licensing baseline conditions and to estimate air-quality impacts. These data will support the development of a defensible EA.

Visual

RAI VIS-1

Please provide additional information on the visual resource management (VRM) classes of the Ludeman Project area.

- A. Please provide documentation of the field reconnaissance of visual resources conducted in June and August 2008 and referred to in ER Section 3.9.6.
- B. Please provide a map that shows the VRM classes within the Ludeman Project area, the two-mile buffer zone, and a 25-mile radius of the Project area.
- C. Please provide a table that details the number of acres for each VRM class within the Ludeman Project, the two-mile buffer zone, and a 25-mile radius during each Project phase at each Satellite.

Section 3.9.6 of the ER refers to a field reconnaissance of visual resources that was conducted in 2008; however, documentation of this reconnaissance is not provided. This information related to the visual environment will provide a quantitative comparison of the area of anticipated land disturbance within each of the VRM classes and an overall comparison of the Project footprint versus the Project area. Information regarding management classes within the 25-mile radius of the Project will support an analysis of the cumulative visual impacts of the Project.

RAI VIS-2

Please describe the lighting impacts for the Proposed Action during each Project phase for every Satellite of the Ludeman Project.

- A. Please provide information on the proposed lighting fixture(s), bulb type, and light shielding at each Satellite.
- B. Please provide information on the locations of lights and hours of use at each Satellite.

More information is required to assess the environmental impacts of night-time lighting of the Ludeman Project area (i.e., the potential for light pollution) on the public views from the Negley Subdivision, other residential locations in the vicinity, local highways and roads, and the North Platte River. This specific information is necessary for the NRC to evaluate the magnitude of potential visual-resource impacts.

Socioeconomics

RAI SOC-1

Please clarify the time interval of ER Table 7-1, which summarizes the estimated employment effects of the Ludeman Project. Does it refer to calendar years or fiscal years?

Information on employment related to the Ludeman Project is necessary for NRC's assessment of socioeconomic impacts.

RAI SOC-2

Please confirm whether the subtotal rows on Figure 7-3 and Figure 7-4 of the ER should read "payroll" or "non-payroll."

It appears that there is an inconsistency between the figure titles, which indicate payroll data, and the subtotal rows, which indicate non-payroll data. This clarification is necessary for the NRC to accurately evaluate the socioeconomic impacts.

RAI SOC-3

Please provide the basis for the State and local tax revenue estimates presented in Table 7-2 of the ER and provide estimates of these revenues for each Satellite.

- A. Please provide the input data and rates used in the calculations of State and local tax revenues described in Section 7.3.3 of the ER.
- B. Please confirm that the “Enterprise Tax Revenues” listed in Table 7-2 of the ER refer to the corporate-dividend tax revenues as referenced in the text, or explain the difference between the two tax revenues and provide values for each.
- C. Please provide a more complete explanation regarding to whom these tax revenues accrue, specifically how much tax revenue would accrue to the State of Wyoming and to the local jurisdictions in the area, such as Converse County and Natrona County. Please provide this information for each Satellite area.

All of this information is necessary to verify the data presented in Table 7-2 and for the NRC to assess accurately the socioeconomic impacts of the Ludeman Project.

Environmental Justice

RAI EJ-1

Please identify whether any minority or low-income populations, at the *census-block-group* level, are located within a 4-mile-radius geographic area around the Ludeman Project site.

The NRC would like to ensure that there are no minority or low-income populations present within 4 miles of the Ludeman Project. The analysis in ER Section 3.10.4 used 2000 “census-block” data and a 50-mile geographic area as its bases in the environmental-justice assessment described in ER Sections 3.10.4.2.1 and 3.10.4.2.2. However, the NRC’s 2004 *Policy Statement on the Treatment of Environmental Justice Matters in NRC Regulatory and Licensing Actions* (69 FR 52040; August 24, 2004) indicates that the “census-block-group” level is to be used in environmental-justice analyses, not the census-block level. In addition, new data for the 2010 Census have become available (see EJ-2 below). Finally, because there do appear to be minority and/or low-income populations within 50 miles, as shown in ER Figures 3.10-3, 3.10-4, and 3.10-5, the NRC would like to determine whether any such populations are located within 4 miles of the Project. The resolution of the figures, however, is insufficient to determine whether any such census-block groups are located within the 4-mile-radius geographic area around the Ludeman Project. This information is needed for the NRC’s environmental-justice analysis in its EA.

RAI EJ-2

Please confirm that the best-available data were used in the ER's environmental-justice analysis.

- A. Please indicate if, and how, the conclusions of the environmental-justice analysis have changed as a result of the 2010 Census and its published *census-block-group*, best-available data (i.e., not the census-block level).
- B. Please provide a table of the 2010 Census data used in the re-evaluated environmental-justice analysis arranged by *census-block group*.

The economic downturn, which began in 2008 and thus would not be reflected in the 2000 Census data, as well as changes in the energy sector in Wyoming may have affected the characteristics of minority and low-income populations present in Wyoming. A review of the newer 2010 Census data is therefore necessary to ensure that the best-available data are used in the environmental-justice analysis. Also, as suggested in the NRC's 2004 environmental-justice guidance cited above, the environmental-justice analysis should be performed at the census-block-group level. This information will be used in the NRC's EA to provide a basis for the conclusions of the environmental-justice analysis.

Historical and Cultural Resources

RAI CR-1

Please define and justify the area of potential effect (APE) for the Ludeman Project used for the cultural-resource inventory's field work, as documented in the Class III Cultural Resource Inventory ("Class III Inventory") by J.C. Ferry and L.A. Peterson, dated March 2009, and included as Appendix B to the TR.

The Class III Inventory for the Ludeman Project defines the APE as the 19,888 acres within the proposed Project's boundaries. The APE may need re-assessment and/or revision should traditional cultural properties (TCPs) be identified by consulting Tribes during Section 106 consultation activities. Information about the selection of Uranium One's APE is necessary to evaluate historical- and cultural-resource impacts. This information is necessary for NRC to complete its evaluation of the impacts of the Ludeman Project.

RAI CR-2

Please provide a complete identification of historical (and cultural, if known) properties within the Ludeman Project area.

- A. Please provide a map showing the location of all proposed site-development activities and areas of ground disturbance, including wells, roads, structures, buildings, and all other improvements. This map should be overlain with the location of all identified historical- and cultural-resource properties within the Project area. A map identifying historical and cultural properties located in the areas of proposed ground-disturbing development was not provided in the license application.

- B. Please provide information about all areas that could be sensitive due to deeply buried sites that are typically not identifiable by surface examinations or shallow probing. These sites could contain important information about early, prehistoric settlement in the region. Please provide a plan to address the potential impacts to these sensitive areas by the activities that would be allowed by the proposed license as well as all proposed mitigation measures.

The maps requested above will provide critical information necessary to determine potential impacts to historical and cultural properties by the proposed uranium recovery activities. Sites with deeply buried properties are vulnerable to impacts from excavation activities associated with Project development, and a plan is necessary prior to Uranium One's developing these areas. The NRC requires this information in order to complete its assessment of the historical- and cultural-resource impacts associated with the Ludeman Project.

RAI CR-3

Please provide additional information regarding the recommendations for eligibility of historic Euroamerican properties for listing on the National Register of Historic Places (NRHP) presented in the Class III Inventory.

- A. Section 6.3 of the Class III Inventory identifies Site 48CO165 (Antelope Creek Crossing, Bozeman Trail), where the Bozeman Trail is already listed in the NRHP, as being located within the Project area. Section 3.8 of the ER states that this trail segment is "no longer able to convey its original character as a frontier trail." Section 6.3.1 of the Class III Inventory states, "[t]he observed segment of the trail no longer contains sufficient integrity to be recommended as a contributing element of the site." The Class III Inventory does not provide detailed maps, photographs, or a comprehensive justification for this recommendation. Please provide photographs and a detailed map for Site 48CO165. In addition, please provide the rationale and justification for the recommendation of "non-contributing" status for Site 48CO165. Specifically, please explain how the adaptive reuse of the road section and the impacts of a nearby highway, the fence line, and the stock pond have caused the Site to lose its integrity of setting, making it "non-contributing" as a NRHP-listed property.
- B. Section 6.3 of the Class III Inventory identifies five windmill sites (Sites 48CO3016, 48CO3017, 48CO3023, 48CP3027, and 48CO3038). The Inventory suggests that each of these properties retains integrity, but that each is "not significant." Clear justification, however, for these recommendations of NRHP ineligibility is not provided. Please clarify the rationale for the recommendation of NRHP ineligibility for each of these sites.

In order for the NRC to assess the impacts to historical and cultural resources within the Ludeman Project area, the eligibility of historical and cultural sites must be determined in consultation with the Wyoming State Historic Preservation Office (SHPO). The NRC requires the information requested above in order to provide a complete and comprehensive data package concerning the NRHP-eligibility determinations while in consultation with the Wyoming SHPO.

RAI CR-4

Please provide additional information on the recommendations concerning the eligibility of prehistoric properties for listing on the NRHP presented in the Class III Inventory.

- A. Section 6.2 of the Class III Inventory identifies 18 prehistoric properties that were recommended as "not eligible" for NRHP listing: 48CO2492, 48CO398, 48CO3009, 48CO3011, 48CO3018, 48CO3020, 48CO3025, 48CO3026, 48CO3028, 48CO3030, 48CO3032, 48CO3035, 48CO3036, 48CO3037, 48CO3045, 48CO3046, 48CO3047, and 48CO3048. These sites were not subjected to archaeological subsurface evaluation by way of shovel probing, auguring, or formal testing. Please explain the rationale for determining the ineligibility of these sites without conducting subsurface testing or geomorphological study.
- B. Section 4 of the Class III Inventory states that subsurface testing was conducted at Sites 48CO3009, 48CO3020, and 48CO3036, but no information is provided in the Inventory to identify the methodology, scope, and results of the subsurface testing. In order to reach a formal finding of eligibility for the NRHP for these three properties in consultation with the Wyoming SHPO, a comprehensive report on the subsurface-testing program is necessary. Please provide a description of the subsurface-testing methods and results, including descriptions of recovered artifacts and soil descriptions. Please provide the rationale for the eligibility recommendations based on the results of Uranium One's subsurface testing.
- C. The NRHP eligibility of six historical properties documented in the Class III Inventory (Sites 48CO3007, 48CO3008, 48CO3019, 48CO3029, 48CO3031, and 48CO3033) was categorized as "[u]nknown under D." Section 3.8 of the ER states, "[t]he National Register status of the remaining six sites cannot be determined without further investigation." A formal determination of NRHP eligibility is necessary for all historical and cultural properties within the APE. Please provide a plan to complete evaluations of historical and cultural properties whose eligibilities are yet to be determined.

In order for the NRC to assess formally the impacts to historical and cultural resources within the Ludeman Project area, the eligibility of prehistoric sites must be determined in consultation with the Wyoming SHPO. This information is needed for the NRC to provide complete and comprehensive data package concerning NRHP-eligibility determinations as it consults with the Wyoming SHPO.

Waste Management

RAI Waste-1

Please provide additional information regarding the management and disposal of solid wastes contaminated with byproduct material. In particular, please list each individual solid waste stream that would be contaminated with byproduct material and provide the total estimated quantities of these wastes that would be generated during the four Project phases at each of the proposed Satellites.

Section 4.13.1.4 of the ER, Solid 11e.(2) Byproduct Material Disposal, states that 100 to 200 shipments (of byproduct waste) per year would be expected during facility decommissioning. If the total byproduct-waste volume during facility decommissioning and site restoration were to be estimated at 4,000 cubic yards (yd³) (ER page 4-63), and each shipment would be approximately 20 yd³ (ER page 4-63), then a minimum of 200 shipments would be disposed of

at the Shirley Basin Facility. Please discuss the precision of the total estimated volume and the number of expected shipments, as the low estimate of 100 shipments is 50 percent of that calculated from the volume shown on page 4-63 of the ER. In order to assess the environmental impacts of the management of these wastes (i.e., solid byproduct wastes), a sound estimate of the total volume is critical.

RAI Waste-2

Please provide additional information regarding the total capacity for solid byproduct waste of the Pathfinder Mine Corporation's Shirley Basin Facility.

- A. Please clarify whether or not there is a limit on the volume of ISR-facility-generated byproduct waste that Uranium One could ship from the Ludeman Project to the Shirley Basin Facility. If there is a limit on the volume of solid byproduct waste that Uranium One could ship to the Shirley Basin Facility from the Ludeman Project, please provide a quantitative value for the limit (e.g., number of yd³).
- B. Please identify at least one alternative waste-disposal facility that Uranium One would use if the Shirley Basin Facility "stops accepting byproduct wastes," as noted on page 4-65 of the ER.

The bulleted text in Section 4.13.1.4 of the ER, under the heading of "Solid 11e.(2) Byproduct Material Management Potential Impacts," includes the sentence "[t]here is a disposal limit of 10,000 cubic yards of byproduct material from generators other than ISR facilities." It is unclear whether the Applicant is indicating that, as an ISR-facility waste generator, it would have no limit on the volume it could ship to the Shirley Basin Facility.

In addition, the discussion in Section 4.13.1.4 of the ER notes that "[w]hile there is potentially sufficient capacity to accept all of the solid 11e.(2) byproduct material from the Proposed Action at the Shirley Basin Facility, Uranium One might be required to find an alternate disposal facility..." Uranium One should identify another byproduct waste disposal facility, in the event it cannot use the Shirley Basin Facility. This information is necessary for the NRC to assess the environmental impacts of waste management at the Ludeman Project.

RAI Waste-3

Please provide additional information regarding Uranium One's management of non-radioactive solid waste streams.

- A. Please provide the estimated volume of non-radioactive solid waste stream that would be generated per unit time during the four Project phases at every proposed Satellite area.
- B. Please confirm Uranium One's intent to dispose of non-radioactive, non-hazardous solid waste at the Glenrock Area Solid Waste Disposal Facility.
- C. Please identify the hazardous-waste disposal facility to which Uranium One proposes to ship the Ludeman Project's hazardous waste (other than used oil and batteries).

Sections 4.13.1.5.1 and 4.13.1.5.2 in the ER discuss the disposal facilities to which the Ludeman Project's non-radioactive, non-hazardous solid wastes could potentially be shipped for disposal. The Glenrock Area Solid Waste Disposal Facility is noted as the nearest facility;

however, Section 3.12.2.1 states that “[t]he nearest solid waste disposal facility ... is a landfill in Gillette [Wyoming].” The text does not explicitly state at which facility Uranium One intends to dispose of its non-radioactive, non-hazardous solid waste. The ER also does not identify the hazardous-waste disposal facility(ies) to which Ludeman hazardous wastes would be shipped and disposed. In order to evaluate the impacts of waste management at the Ludeman Project, waste-disposal facilities should be explicitly identified for both non-radioactive, non-hazardous solid waste and non-radioactive, liquid and solid hazardous wastes. This information is necessary for the NRC to evaluate effectively the environmental impacts of waste management at the Ludeman Project.

RAI Waste-4

Please describe the measures that Uranium One would implement to mitigate the impacts of managing solid byproduct waste.

The discussion of Uranium One’s management of solid byproduct wastes in Section 5.13.8 of the ER should be expanded to include measures that would be implemented to mitigate the impacts of managing these wastes. The NRC requires this information for its environmental impact analysis.

RAI Waste-5

Please provide the projected volumes of brine, excess permeate, and other liquid byproduct wastes that would be generated and disposed of during the four Project phases at each of the proposed Satellite areas.

Section 4.13.1 of the ER describes the generation of byproduct liquid waste that would be managed in the surface impoundments and disposed of by deep-well injection. The waste disposed of by deep-well injection would include brine, excess permeate, and other byproduct liquid wastes generated at the Satellite areas and well “work-over” operations in the wellfields. The volumes of all liquid byproduct waste streams are needed for the NRC to assess the impacts of proposed waste management and disposal at the Ludeman Project. This information will support the NRC’s assessment of waste-management impacts.

RAI Waste-6

Please provide the expected chemical composition of excess permeate.

Section 4.13.1.1 of the ER describes the injection of excess permeate into wellfields for recovery or restoration. Assessment of any related impacts to water quality from excursions into the aquifers adjacent to the exempt aquifer will require an understanding of the chemical composition of the excess permeate. This information will support the assessment of waste-management impacts.

RAI Waste-7

Please provide additional information on the mud pits associated with Uranium One’s drilling of exploration and delineation holes and its installation of production, injection, and monitoring wells.

- A. Please describe the dimensions of the mud pits and the methodology that would be used by Uranium One to excavate and close the pits.
- B. Please provide estimates of the volumes of drill cuttings, other liquid wastes, and ground water that would be managed in the mud pits.

Mud pits associated with well drilling are noted as an impact to land use in Section 5.1 of the ER and as a source of radon-222 in Section 4.1 of the TR. In addition, the EA will consider the mud pits in its waste-management-impact analysis. Although restoration of the mud pits is discussed in Sections 1.8.1.2 and 5.1 of the ER, no information is provided on the design of the pits or on the volume of drill cuttings, other liquid wastes, and ground water that could be discharged to the pits. Information on the dimensions and other features of the pits, as well as the materials that would be contained in the pits, is necessary to assess waste-management impacts.

RAI Waste-8

Please provide additional information on the ground water discharged from wells during well development and groundwater sample collection.

- A. Please specify the disposal method for the ground water that would be pumped and discharged during the development of injection, recovery, and monitoring wells and that would be purged before routine sample collection.
- B. Please provide an estimate of the volume of ground water that would be pumped and discharged during the above activities.

Information on the disposal of ground water pumped and discharged from injection, production, and monitoring wells as well as ground water pumped from monitoring wells to purge them before routine sampling is necessary to assess waste-management impacts. Uranium One's pumping of ground water to develop wells is described in Section 1.8.1.3 of the ER and Section 3.1.3.3 of the TR. The purging of ground water from monitoring wells before sample collection is discussed in Section 6.2.2 of the ER. No information is provided, however, on the discharge and disposal of the excess ground water. The disposal methods proposed by Uranium One for waste ground water will support the NRC's analysis of waste-management impacts.

RAI Waste-9

Please provide information on the ground water discharged from the aquifer tests that would be performed at each wellfield at each Satellite area.

- A. Please estimate the volume of ground water that would be discharged from the aquifer test that would be performed at each wellfield, as well as the assumptions required to produce the estimate.
- B. Please specify the proposed disposal method for the ground water generated during each aquifer test.

Section 7.5.3 of the TR notes that aquifer tests would be conducted on each wellfield to assess the hydraulic communication between the production zone and the overlying and underlying aquifers. Assessment of waste-management impacts must consider the volume and disposal of the ground water that would be discharged from these aquifer tests.