AREVA

10 CFR 70.5

September 25, 2009

AES-O-NRC-09-00136-0

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

AREVA Enrichment Services LLC
Eagle Rock Enrichment Facility
NRC Docket No: 70-7015

Subject: Response to Request for Additional Information – AREVA Enrichment Services LLC Environmental Report for the Eagle Rock Enrichment Facility – RAI 1 and RAI 3 Responses

On April 23, 2009, AREVA Enrichment Services LLC (AES) submitted a revised License Application to the U.S. Nuclear Regulatory Commission (NRC) to construct and operate the Eagle Rock Enrichment Facility (EREF) in Bonneville County, Idaho (Ref. 1).

On August 10, 2009, the NRC transmitted to AES the Request for Additional Information (RAI) for the EREF Environmental Report (ER) (Ref. 2).

On September 9, 2009, AES submitted the ER RAI responses to the NRC (Ref. 3). In this letter, AES committed to provide the impacts to the EREF License Application in response to ER RAI 1.b, and to provide the response to ER RAI 3 (parts a, b, and c) by September 25, 2009. AES hereby submits the supplemental information in response to ER RAI 1.b and the complete response to ER RAI 3.

Additionally, a correction to the previous ER RAI 1.b response changes the estimated VOC emissions during construction from 688 to 865 pounds per year. The VOC emissions during construction (688 pounds per year) provided in the September 9, 2009 response (Ref. 3) considered working losses from the two above-ground storage tanks, but did not include vehicle fuel tanks being filled.

Enclosure 2 provides the AES response to ER RAI 1.b and ER RAI 3. The AES responses include a description of each RAI, the AES response, and the associated markups of the Environmental Report, ISA Summary, Safety Analysis Report, Emergency Plan, Fundamental Nuclear Material Control Plan, Physical Security Plan, and Standard Practices and Procedure Plan.

AREVA ENRICHMENT SERVICES LLC

Solomon Pond Park - 400 Donald Lynch Boulevard, Marlborough, MA 01752
Tel. : 508 229 2100 - Fax : 508 573 6610 - www.areva.com

NMSS01

Enclosure 3.1 provides markup pages for ER RAI 1.b. Enclosure 3.2 provides markup pages for ER RAI 3.

Enclosure 4 provides markups pages for ER RAI 1.b that are SUNSI and should be withheld in accordance with 10 CFR 2.390.

The markups of the Environmental Report, ISA Summary, Safety Analysis Report, Emergency Plan, Fundamental Nuclear Material Control Plan, Physical Security Plan, and Standard Practices and Procedure Plan provided in Enclosure 4 contain security-related sensitive unclassified non-safeguards information (SUNSI). This information was identified as SUNSI by using the guidance in NRC Regulatory Issue Summary (RIS) 2005-31, "Control of Security-Related Sensitive Unclassified Non-Safeguards Information Handled by Individuals, Firms, and Entities Subject to NRC Regulation of the Use of Source, Byproduct, and Specific Nuclear Material." Enclosure 1 provides an affidavit supporting our request to withhold this information in accordance with 10 CFR 2.390(b).

The EREF License Application will be revised to include the markup pages of the Environmental Report, ISA Summary, Safety Analysis Report, Emergency Plan, Fundamental Nuclear Material Control Plan, Physical Security Plan, and Standard Practices and Procedure Plan provided in Enclosures 3.1, 3.2, and 4 in Revision 2 of the EREF License Application.

If you have any questions, please contact me at 508-573-6554.

Respectfully,

J. G. Kay

Jim A. Kay
Licensing Manager

References:

1) S. Shakir (AES) Letter to the U.S. Nuclear Regulatory Commission, Revision 1 to License Application for the Eagle Rock Enrichment Facility, dated April 23, 2009.
2) B. Reilly (U.S. Nuclear Regulatory Commission) Letter to Jim Kay, Licensing Manager, Eagle Rock Enrichment Facility, AREVA Enrichment Services LLC, Request for Additional Information - AREVA Enrichment Services LLC Environmental Report for the Eagle Rock Enrichment Facility, dated August 10, 2009.
3) J. Kay (AES) Letter to the U.S. Nuclear Regulatory Commission, Response to Request for Additional Information – AREVA Enrichment Services LLC Environmental Report for the Eagle Rock Enrichment Facility, dated September 9, 2009.

Enclosures:

1) Affidavit of Jim A. Kay
2) Responses to ER RAI 1.b and ER RAI 3
3) Non-SUNSI Supporting Information
4) SUNSI Supporting Information

Commitments:

The EREF License Application will be revised to include the markup pages of the Environmental Report, ISA Summary, Safety Analysis Report, Emergency Plan, Fundamental Nuclear Material Control Plan, Physical Security Plan, and Standard Practices and Procedure Plan provided in Enclosures 3.1, 3.2, and 4 in Revision 2 of the EREF License Application.

CC:
Breeda Reilly, U.S. NRC Senior Project Manager
Gloria Kulesa, U.S. NRC Senior Project Manager

a) I am the Licensing Manager for the AREVA Enrichment Services LLC (AES), and as such have the responsibility of reviewing the proprietary and confidential information sought to be withheld from public disclosure in connection with our application to construct and operate a uranium enrichment facility. I am authorized to apply for the withholding of such proprietary and confidential information from public disclosure on behalf of AES.

b) I am making this affidavit in conformance with the provisions of 10 CFR 2.390 of the regulations of the Nuclear Regulatory Commission (NRC), and in conjunction with AES's request for withholding, which is accompanied by this affidavit.

c) I have knowledge of the criteria used by AES in designating information as proprietary or confidential.

d) By this submittal, AES seeks to protect from disclosure certain security-related sensitive unclassified non-safeguards information (SUNSI) contained in the markups of the Environmental Report, ISA Summary, Safety Analysis Report, Emergency Plan, Fundamental Nuclear Material Control Plan, Physical Security Plan, and Standard Practices and Procedure Plan (Enclosure 4).

   1. This information is previously determined to be security-related information.

   This affidavit discusses the bases for withholding certain portions of this submittal, as indicated therein, from public disclosure.

e) Pursuant to the provisions of 10 CFR 2.390(b)(4), the following is furnished for consideration by the NRC in determining whether the security-related (SUNSI) information sought to be protected should be withheld from public disclosure.

   1. This information is previously determined to be security-related information.

   2. The information sought to be withheld is being provided to the NRC in confidence, and, under the provisions of 10 CFR 2.390, it is to be received in confidence by the NRC.

   3. The information sought to be withheld is not available in public sources, to the best of AES's knowledge and belief.

For all of the reasons discussed above, AES requests that the identified security-related (SUNSI) information be withheld from public disclosure.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on September 25, 2009.

J. A. Kay

Mr. Jim A. Kay
Licensing Manager of AES LLC
400 Donald Lynch Boulevard
Marlborough, MA 01752

Maureen Lyons

Notary Public

ER RAI 1.b

Provide additional information regarding air emissions during construction and operation of the Eagle Rock Enrichment Facility (EREF).

b. Provide details regarding the combined gasoline and diesel fueling station that will be operational on site, including size and design of storage tanks, spill prevention measures, fuel delivery systems, fuel dispensing equipment, and other factors that must be addressed to safely incorporate such fueling operations into site operating plans (e.g. safe distances from buildings housing UF_6, the Full Tails, Full Feed and Empty Cylinder Storage Pads, Full Product Cylinder Storage Pad, and Cylinder Transportation Path, amendments to Hazardous material management plans and training regimens, fire safety, etc.). Provide an air impact analysis for the fuel storage and dispensing activities.

The evaluation of air quality impacts requires consideration of all sources of potential air emissions for evaluation against the National Ambient Air Quality Standards. Because vehicle and equipment refueling on-site would be required during construction and operation of the EREF, impacts to air quality would occur. Sections 4.6.1 and 4.6.2 (AES, 2009a) do not consider refueling emissions.

AES Response to NRC RAI:

b. The combined gasoline and diesel fueling station that will be operational on site will consist of one, 2000-gallon aboveground tank for gasoline storage and one, 2000-gallon aboveground tank for diesel fuel storage. The tanks will be constructed of welded steel, insulated by 1/4 inch Styrofoam and 30 mil high density polyethylene (HDPE) membrane and encased in six inch reinforced concrete. The tank system includes a 5-gallon spill containment surrounding the fill pipe.

   Best management practices for fueling activities will be implemented to reduce the potential for releases or other incidents at the fueling facility. These can include: requiring delivery contractors to undergo training prior to being allowed on-site, having reduced speeds for tanker trucks delivering fuel to the facility, posting warning signs at the fueling facility, use of liquid-level gauges to prevent overfills, paving the unloading areas and installing curbing to control small spills, requiring delivery contractors to carry spill kits, and other measures to reduce the potential for environmental impacts at the fueling facility.

   The potential air quality impacts from on-site fueling activities would consist of VOC (petroleum distillates) emissions from the fuel storage and dispensing activities. These VOC emissions are estimated to be ***865 pounds per year during construction*** and 657 pounds per year during operations, based on EPA AP-42 Fifth Edition, Volume 1, Chapter 7.1, November, 2006, and the EPA TANKS (Version 4.09) computer program. In accordance with IDAPA 58.01.01, Section 317 b.i.(3):

   - operation, loading and unloading of volatile organic compound storage tanks, ten thousand gallons capacity or less, with lids or other appropriate closure, vapor pressure not greater than eighty (80) mm Hg at 21 degrees C, and

- operation, loading and unloading of gasoline storage tanks, ten thousand gallons capacity or less, with lids or other appropriate closure,

are considered insignificant activities.

The potential emissions from the on-site fueling facility will not cause exceedances of air quality standards.

An evaluation of a gasoline tanker spill and fire was performed to assess any potential for impacting material-at-risk (MAR) (UF_6 or byproducts) that might result in a release exceeding the performance requirements of 10CFR70.61. The sequence postulated a failure of the fuel transfer hose and the inventory of the largest anticipated delivery vehicle at the offload area for the proposed Gasoline and Diesel Refueling Station. This fire event did not result in exposures that would result in a release of MAR. The revised Fire Risk Assessment is available for review by the NRC in AES's office.

An existing set of Integrated Safety Assessment (ISA) sequences previously considered the possibility of a fire involving a bulk fuel delivery vehicle occurring near areas with material-at-risk storage. An Item Relied on For Safety (IROFS) is in place to control the delivery route and staging of fuel delivery vehicles as well as ensuring spill containment measures are in-place at designated offload areas. These sequences and the IROFS will be revised and extended to include the addition of gasoline and diesel fuel deliveries to the Gasoline and Diesel Refueling Station.

Associated EREF License Application Revisions:

The EREF License Application will be revised to include the markups in response to ER RAI 1.b as shown in Enclosures 3.1 and 4.1.

Attachments:

Enclosures 3.1 and 4.1 provide the markups in response to ER RAI 1.b:

Commitments:

The EREF License Application will be revised to include the markups in Enclosures 3.1 and 4.1 in Revision 2 of the License Application.

ER RAI 3

Provide air impact analyses that follow the latest guidance with the most up-to-date and most relevant available data.

a. Air dispersion analyses to assess human health impacts used recent meteorological data from the EBR station (now known as MFC) on the Idaho National Laboratory (INL) site (Section 4.6.2.3). This data is representative of the climate at the EREF site. However, older data from the Pocatello Municipal Airport (which is less representative than EBR data) was used in Section 4.6.1 (AES 2009a) to evaluate air emissions during construction. Provide revised impacts for construction and operation from the application of the AERMOD dispersion model, substituting the most recent 5 years of meteorological data available from INL's station EBR for the 1988-1992-era data.

b. Provide revised calculations for fugitive particulate emissions resulting from unpaved roads, using the Particulate Matter (PM) 10/PM30 and PM2.5/PM30 ratios in the U.S. Environmental Protection Agency's Modeling and Inventories AP-42: Fifth Edition, Section 13.2.2 - see Table 13.2.2-2 (1.5/4.9 and 0.15/4.9, respectively).

c. Provide an expanded discussion on how a 90% reduction in fugitive dust generation will result from proposed twice/day watering; demonstrate how this rate of watering will result in a sustained moisture ratio M of 4.5 necessary to ensure 90% reduction (see Figure 13.2.2-2 of U.S. Environmental Protection Agency's AP-42: Fifth Edition, Section 13.2.2). Revise fugitive dust reduction percentages in accordance with the expected moisture ratio, averaged over the typical construction day.

Update and revise Section 4.6 using the most up-to-date information such that an accurate assessment of the air impacts can be completed.

AES Response to NRC RAI:

RAI 3.a and 3.b

In response to RAI 3.a, an updated AERMOD dispersion modeling analysis was performed using the most recent five years (2003-2007) of hourly surface meteorological data from the EBR station on the INL site (determined to be representative of the EREF site) and from the National Weather Service (NWS) station at Pocatello Municipal Airport in Pocatello, Idaho along with concurrent upper air sounding data collected at the Boise International Airport in Boise, Idaho. The three sets of data (two surface and one upper air) were input into AERMOD's general purpose meteorological preprocessor AERMET, which organizes and processes meteorological data and estimates the boundary layer parameters necessary for dispersion calculations. AERMET processed the meteorological data by utilizing the Pocatello data only when the EBR station data was not available. Note that the wind speed and wind direction data, which is most critical to the estimated pollutant concentrations, was obtained from the EBR station and was used in the dispersion modeling analysis.

In response to RAI 3.b, the construction activity emission factor, (obtained from AP-42 Chapter 13.2.3, Heavy Construction Equipment and used in the dispersion modeling analysis), was updated to adjust the ratio of Total Suspended Particulate (TSP) to PM_{10} and $PM_{2.5}$. The ratio of TSP to PM_{10} and $PM_{2.5}$ was updated to reflect the methodology contained in AP-42 Chapter 13.2.2 - Introduction to Fugitive Dust Sources – Unpaved Roads. The fugitive dust construction activity TSP emission factor was updated based on industrial unpaved road factors contained in AP-42. The ratio of TSP that is PM_{10} is 0.31 and the ratio of TSP that is $PM_{2.5}$ is 0.03.

The factor to account for the high silt content of the site soil was also updated based on information obtained from a University of Idaho report titled "Hydraulic Conductivity and Moisture Retention of Southern Idaho's Silt Loam Soils", January 1977. This report states that the soil silt content in the area of the site is approximately 60%. Therefore, the correction factor for silt content is 60% / 30% = 2.0.

The updated dispersion modeling was conducted at the sixty-two potential property line receptors selected for the previous refined modeling analysis to determine the maximum estimated air quality impacts caused by construction site preparation activity. In addition to these potential property line receptors, fifty potential receptor locations were modeled along U.S. Highway 20, which is the major roadway to the south of the proposed site. These receptors (approximately 100 meters apart along U.S. Highway 20) were selected because U.S. Highway 20 is the closest area where the general public would have reasonable access to the site location. Therefore, human exposure to any activity conducted at the proposed facility would most likely occur at these U.S. Highway 20 receptor locations.

The dispersion modeling analysis for the property line receptors included the use of an updated workday emission rate (in g/s) assuming approximately 89 ha (221 acres) of the construction site would be under heavy construction at any given time. For the potential property line receptors, the resulting estimate of workday emission rate is 13.7 g/s (108.9 lb/hr) for PM_{10} emissions and 1.4 g/s (10.9 lb/hr) for $PM_{2.5}$ emissions.

For the U.S. Highway 20 receptor locations, the workday emission rate (in g/s) was calculated assuming 208 ha (515 acres) of the entire construction site would be under heavy construction at any given time. The resulting estimate of the workday emission rate for PM_{10} was determined to be 31.8 g/s (252.4 lb/hr) and 3.2 g/s (25.2 lb/hr) for $PM_{2.5}$ emissions.

All other assumptions and methodologies that were utilized for the previous dispersion modeling analysis were used for this updated analysis including support vehicle and construction equipment operations and emissions data, construction site operations data, dust control goals, background concentrations and the AERMOD processing methodologies used in AERMAP and AERSURFACE remain unchanged.

The results of the updated air quality impact AERMOD dispersion modeling analysis for the EREF construction site preparation activities are presented in Table 1 for the potential property line receptor locations and Table 2 for the potential U.S. Highway 20 receptor locations. All predicted concentrations shown in the tables include an ambient background level. As shown in Tables 1 and 2, none of the modeled pollutant concentrations exceed any National Ambient Air Quality Standards (NAAQS).

The updated air modeling does not impact the evaluation of air emissions during operations.

Table 1
Updated Results of Air Quality Impact AERMOD Dispersion Modeling for EREF Construction Site Preparation Activity
Property Line Receptor Locations

Pollutant	Averaging Period	Standard	Modeled Maximum Concentration	Units	Exceedance?
Carbon Monoxide (CO)	8-Hour	9 ppm	2.2	ppm	No
	1-Hour	35 ppm	4.6	ppm	No
Nitrogen Dioxide (NO_2)	Annual	100 μg/m^3	11.9	ug/m^3	No
Sulfur Dioxide (SO_2)	Annual	80 μg/m^3	15.7	ug/m^3	No
	24-Hour	365 μg/m^3	63.8	ug/m^3	No
	3-Hour	1300 μg/m^3	165.7	ug/m^3	No
Particulate Matter - PM_{10}	Annual	Revoked 2006	27.3	ug/m^3	NA
	24-Hour	150 μg/m^3	150.0	ug/m^3	No
Particulate Matter - $PM_{2.5}$	Annual	15 μg/m^3	7.0	ug/m^3	No
	24-Hour	35 μg/m^3	28.0	ug/m^3	No

Note:
All Modeled Maximum Concentrations include an ambient background concentration.
NA means not applicable.

Table 2
Results of Air Quality Impact AERMOD Dispersion Modeling for EREF Construction Site Preparation Activity
U.S. Highway 20 Receptor Locations

Pollutant	Averaging Period	Standard	Modeled Maximum Concentration	Units	Exceedance?
Carbon Monoxide (CO)	8-Hour	9 ppm	2.1	ppm	No
	1-Hour	35 ppm	4.4	ppm	No
Nitrogen Dioxide (NO_2)	Annual	100 μg/m^3	11.3	ug/m^3	No
Sulfur Dioxide (SO_2)	Annual	80 μg/m^3	15.7	ug/m^3	No
	24-Hour	365 μg/m^3	63.3	ug/m^3	No
	3-Hour	1300 μg/m^3	162.3	ug/m^3	No
Particulate Matter - PM_{10}	Annual	Revoked 2006	23.2	ug/m^3	NA
	24-Hour	150 μg/m^3	113.5	ug/m^3	No
Particulate Matter - $PM_{2.5}$	Annual	15 μg/m^3	6.6	ug/m^3	No
	24-Hour	35 μg/m^3	24.3	ug/m^3	No

Note: All Modeled Maximum Concentrations include an ambient background concentration.
NA means not applicable.

RAI 3.c

An estimated emission control efficiency of 90 percent was used in the evaluation of fugitive dusts from construction activities. This control factor was taken from Figure 13.2.2-2 of U.S. Environmental Protection Agency's (EPA's) AP-42: Fifth Edition, Section 13.2.2, which shows that an up to 90 percent reduction can be achieved with dust suppression by watering when watering achieves a soil moisture ratio of 4.5 (controlled soils/uncontrolled soils). As discussed in the EREF ER Section 4.2.5, mitigation measures will be undertaken to reduce potential impacts from fugitive dusts. These measures will include using water or surfactants for dust suppression on dirt roads, in clearing and grading operations, and in construction activities; covering open-bodied trucks that transport materials likely to give rise to airborne dust; promptly removing earthen materials on paved roads carried onto the roadway by wind, trucks, or earth moving equipment; and promptly stabilizing or covering bare areas once roadway and highway entrance earth moving activities are completed.

To quantitatively assess the amount of water that could be needed for dust suppression, the maximum amount of watering required to achieve the 90% goal, based on obtaining the 4.5 moisture ratio shown in Figure 13.2.2-2, was estimated using a spreadsheet developed by the EPA. The spreadsheet calculates moisture content of a road surface over time. Inputs into the spreadsheet include monthly Class A pan evaporation values, hourly meteorological data for precipitation and humidity, vehicle information and road surface material information. Meteorological data from the EBR station was used in the spreadsheet. Vehicle information was based on support vehicle and construction equipment data used in the previous dispersion modeling analysis. All other inputs were obtained from tables presented in AP-42 Chapter 13.2.2.

In order to determine the worst case watering requirement for the construction project site, the driest month (July) was selected based on the EBR station meteorological data inputs. The calculated uncontrolled road surface moisture content was multiplied by 4.5 to determine what road surface moisture content would be needed to achieve the 90% dust control goal. The spreadsheet was adjusted to calculate the amount of precipitation that would be needed to obtain the desired moisture content. The amount of precipitation was converted to the amount of water that needs to be applied using an equivalent of 5.6 gallons of water applied for every inch of precipitation. Based on this calculation, in order to achieve the 90% dust control goal for the worst case scenario, the project would be required to apply approximately 18,000 gallons per day onto unpaved roads where vehicles will be traveling. It was estimated that approximately 50 acres of the project site would be road surface, which equates to about 20 miles of roads traversing the site.

The watering needs for a typical construction day was calculated using the equations found in AP-42 Chapter 13.2.2 for calculating emissions from vehicles traveling on unpaved surfaces at industrial sites. The calculation was based on the road surface silt content, mean vehicle weight of support vehicles and construction equipment traveling on site, vehicle miles traveled and the number of days in a calendar year with at least 0.254 mm (0.01 in) of precipitation. Watering requirements were determined by estimating the number of precipitation days that would be needed to achieve the 90% dust control goal above the number of natural precipitation days (54 days) that occurred throughout the year. Based on this calculation, the project would be required to apply approximately 15,000 gallons of water on the typical construction day to achieve the 90% dust control goal.

Referring to AES letter AES-O-NRC-09-01234-0 to the NRC, Response to Requests for Additional Information – AREVA Enrichment Services, LLC, Environmental Report for the Eagle Rock Enrichment Facility, dated September 9, 2009 (refer to the response for RAI 16 and markups for ER Table 3.4-15), note that the calculated amounts of water, to be applied to unpaved roads for the worst case and typical construction day scenarios (i.e., 18,000 gal/day and 15,000 gal/day, respectively), are less than the estimate of 55,000 gal/day of water for dust control during the period of heavy construction.

In addition to dust suppression by the application of water or surfactants, additional dust mitigation measures will be taken as presented in AES letter AES-O-NRC-09-00079-0 to the NRC, Response to Information Needs Identified by the U.S. Nuclear Regulatory Commission for the AREVA Enrichment Services Eagle Rock Enrichment Facility - Environmental Report, dated July 7, 2009 (refer to Response 1.3 and the markups shown in Attachment 1.3):

Mitigation measures will be used to minimize the release of dirt and other matter onto U.S. Highway 20 during construction. These measures were discussed in an AES letter to NRC dated July 7, 2009 (AES-0-NRC-09-00079-0) and will include the following:

- Gravel pads will be built at the EREF entry/exit points along U.S. Highway 20 in accordance with the Idaho Department of Environmental Quality (IDEQ) Catalog of Stormwater Best Management Practices for Idaho Cities and Counties, Volume 2, Erosion and Sediment Controls. Periodic top dressing of clean stone will be applied to the gravel pads, as needed, to maintain effectiveness of the stone voids. Tire washing will be performed as needed, on a stabilized stone (gravel) area which drains to a sediment trap.
- Vehicles will be inspected for cleanliness from dirt and other matter that could be released onto Highway 20 prior to entering U.S. Highway 20.
- Open-bodied trucks will be covered (e.g., the installation of tarps over open beds) to prevent debris from falling off or blowing out of vehicles onto the highway.

AES will comply with IDAPA 58.01.01 Part 650 for the prevention of the generation of fugitive dusts through its Best Management Practices (mitigation measures) described above, and will prepare and implement a Dust Prevention and Control Plan in accordance with IDEQ guidance.

Associated EREF License Application Revisions:

The EREF License Application will be revised to include the markups in response to ER RAI 3 as shown in Enclosure 3.2.

Attachments:

Enclosure 3.2 provides the markups in response to ER RAI 3.

Commitments:

The EREF License Application will be revised to include the markups in Enclosures 3.2 in Revision 2 of the License Application.

ENCLOSURE 3.1

ER RAI 1.b – MARKUP PAGES

The Gasoline and Diesel Fueling Station (GDFS) will be used for vehicle repair and maintenance and for fuel dispensing from an adjacent pump island.

The EREF "Cylinder Preparation System" uses a process similar to the Claiborne Enrichment Center design in conditioning empty, clean or used (i.e., with heel) 30B or 48Y cylinders except the EREF has six conditioning stations rather than the four the Claiborne Enrichment Center design has. The EREF also has a Cylinder Evacuation System which is used to reduce the heel in used 30B and 48Y cylinders and the Claiborne Enrichment Center and NEF designs does not. This system uses six donor stations, two receiver stations and two large capacity cold traps arranged in two subsystems.

The major structures and areas of the EREF are described below and shown in Figure 1.2-4, EREF Buildings. A more detailed discussion of these structures and areas, which are different than the corresponding structures and areas for the Claiborne Enrichment Center and the NEF, is provided in the Integrated Safety Analysis Summary, Section 3.3, "Facility Description."

The Guard House serves as the primary access control point for the facility. It also contains the necessary space and provisions for an alternate Emergency Operations Center (EOC) should the primary facility become unusable.

The Separations Building Modules (SBM) house two, essentially identical, plant process units. Each SBM is comprised of a UF_6 Handling Area, two Cascade Halls, and a Process Services Corridor. The EREF has four SBMs. UF_6 is fed into the Cascade Halls and enriched UF_6 and depleted UF_6 are removed.

The Centrifuge Assembly Building (CAB) is used to assemble centrifuges before the centrifuges are moved to the Separations Building Modules and installed in the cascades.

The Technical Support Building (TSB) contains various laboratories and maintenance facilities necessary to safely operate and maintain the facility. The Operation Support Building (OSB) contains a Medical Room and the Control Room. In an emergency, the Control Room serves as the primary Emergency Operations Center (EOC) for the facility. Most site infrastructure facilities (i.e., laboratories for sample analysis) are located in the TSB and the OSB.

The Electrical Services Building (ESB) houses four standby diesel generators (DGs) that provide power to protect selected equipment in the unlikely event of loss of off-site supplied power. The ESB also contains electrical equipment. The ESB for the CAB houses four transformers and switchgear, and control and lighting panels which provide the CAB and the adjacent long term warehouse with power. The Mechanical Services Buildings (MSBs) house air compressors, the demineralized water system and portions of the centrifuge cooling water system.

INSERT

The Cylinder Receipt and Shipping Building (CRSB) is used to receive, inspect, and weigh cylinders of natural UF_6 sent to the facility and ship cylinders of enriched UF_6 to customers.

The Cylinder Storage Pads are a series of concrete pads designed to temporarily store empty and full feed, product, and tails cylinders. The Full Tails Cylinder Storage Pads would need to accommodate a total of 25,718 cylinders generated over the lifetime of the facility. Two single-lined Cylinder Storage Pads Stormwater Retention Basins will be used specifically to retain runoff from the Cylinder Storage Pads during heavy rainfalls. These basins will also receive treated effluent from the packaged domestic sanitary sewage treatment plant. The unlined Site Stormwater Detention Basin will receive rainfall runoff from the balance of the developed plant site. No other liquid effluent will be discharged from the facility.

1.2.4 Schedule of Major Steps Associated with the Proposed Action

The EREF will be constructed in eight phases corresponding to the successive completion of eight centrifuge Cascade Halls. All construction will be completed in 2022. Each phase will subject to permit review. The threshold emission rate for nitrogen dioxide shall be based on total oxides of nitrogen.

Operating Permits (under Title V) are required for major sources that have a potential to emit more than 4.5 kg (10 lbs) per hour or 91 MT (100 tons) per year for criteria pollutants, or for landfills greater than 2.5 million m^3 (88 million ft^3). In addition, major sources also include facilities that have the potential to emit greater than 9.1 MT (10 tons) per year of a single Hazardous Air Pollutant, or 22.7 MT (25 tons) per year of any combination of Hazardous Air Pollutants. Air emissions for the proposed EREF during operations will be less than the limits identified by the standards; therefore, a permit is not required. Similarly, the proposed EREF would not require a National Emissions Standards for Hazardous Air Pollutants (NESHAPS) permit since it would not be a major source of criteria air pollutants and would not be a source of hazardous air pollutants.

For this facility, the potential applicable state permit is the permit to construct (PTC) which is issued by the IDEQ. Specifically, an air quality PTC is required prior to construction or modification of stationary sources, such as buildings, structures, and other installations that emit, or may emit, pollutants into the air. A PTC is also required for certain portable equipment such as generators. The State of Idaho uses a self-exemption process for air quality permits (IDAPA, 2008i). The Rules for Control of Air Pollution in Idaho provide for exemptions to the PTC. These conditions are as follows:

1. Idaho Administrative Code (IDAPA) 58.01.01.220 (IDAPA, 2008i) states the general exemption criteria to be used by owners or operators to exempt certain sources from the requirement to obtain a permit to construct. No permit to construct is required for a source that satisfies the following criteria in subparts (01.a and 01.b):

    a. (01.a) Maximum capacity of a source to emit an air pollutant under its physical and operational design without consideration of limitations on emissions such as air pollutant control equipment, restriction on hours of operation and restrictions on the type and amount of material combusted, stored or processed would not (i.) equal or exceed one hundred (100) tons per year of any regulated air pollutant and (ii.) cause an increase in the emissions of a major facility that equals or exceeds the significant emission rates set out in the definition of significant at Section 006.

    b. (01.b) The source is not part of a proposed new major facility or part of a proposed major modification.

2. IDAPA 58.01.01.222.01(d) (IDAPA, 2008i) states that a source is exempt if it satisfies the criteria set forth in section 220 and if stationary internal combustion engines are used exclusively for emergency purposes, which are operated less than or equal to aggregate of five hundred (500) hours total per year and are fueled by natural gas, propane gas, liquefied petroleum gas, distillate fuel oils, residual fuel oils, and diesel fuel.

    Insert A

    The other exemption in IDAPA 58.01.01.222.02(c) (IDAPA, 2008i) is for fuel burning equipment used for indirect heating and for reheating furnaces using natural gas, propane gas, liquefied petroleum gas, or biogas (gas produced by the anaerobic decomposition of organic material through a controlled process) with hydrogen sulfide concentrations less than two hundred (200) parts per million by volume (ppmv) exclusively with a capacity of less than (50) million (British thermal units) BTUs per hour input.

3. Record Retention (IDAPA 58.01.01.220.02) (IDAPA, 2008i) states that the owner or operator shall maintain documentation on-site which shall identify the exemption determined to apply to the source and verify that the source qualifies for the identified exemption. The records and documentation shall be kept for a period of time not less than five (5) years

Insert B

from the date of when the exemption determination has been made or for the life of the source for which the exemption has been determined to apply, which ever is greater, or until such time as a permit to construct or an operating permit is issued which covers the operation of the source. The owner or operator shall submit the documentation to the Department upon request.

The proposed facility qualifies for these exemptions and, therefore, a permit is not required for the following reasons:

1. The six diesel generators (standby (4), security, and fire pump), will be used exclusively for emergency purposes and for the purpose of testing these generators, the generators will be meet the hours of operation for testing specified in the IDAPA 58.01.01.222.01(d) (IDAPA, 2008i). Records will be maintained to document the hours of operation for each diesel generator.
2. The six (6) diesel generators have the potential to emit less than 25 tons per year of critical air pollutants (oxides of nitrogen (NOx), carbon monoxide (CO), oxides of sulfur dioxide (SO_2), particulate matter (PM_{10}), and volatile organic compounds (VOC)).

Insert C

Idaho Water Quality Division

To implement the Safe Drinking Water Act (SDWA) requirements on a state level, the Idaho Environmental Protection and Health Act (Idaho Code Chapter 1, Title 39) (IDAHO Code, 2008c) gives the Idaho Department of Environmental Quality (IDEQ) the authority to promulgate rules governing quality and safety of drinking water (IDAPA, 2008b). The Water Quality Division (WQD) is delegated responsibility to implement the SDWA. The state 1) ensures that water systems are tested for contaminants, 2) reviews plans for water system improvements, 3) conducts on-site inspections and sanitary surveys, 4) provides training and technical assistance, and 5) takes action against water systems not meeting standards (EPA, 2004). In addition, a state has primary enforcement responsibility for drinking water systems in the state (CFR, 2008q).

Therefore, drinking water provided at the proposed facility will be governed by the SDWA as a public drinking water system. Rules governing quality and safety of drinking water in Idaho have been promulgated in IDAPA 58.01.08 (IDAPA, 2008b). No person may construct a drinking water system until it is demonstrated to the WQD that the water system will have adequate technical, financial, and managerial capacity (IDAPA, 2008b). Although there is not a permit required for a drinking water system, AES must have a drinking water facility plan that includes sufficient detail to demonstrate that the proposed project meets applicable criteria. The facility plan generally addresses the overall system-wide plan. The facility plan shall identify and evaluate problems related to the drinking water system, assemble basic information, present criteria and assumptions, examine alternative solutions with preliminary layouts and cost estimates, describe financing methods, set forth anticipated charges for users, and review organizational and staffing requirements.

The WQD requires facility owners of drinking water systems to place the direct supervision and operation of their systems under a properly licensed operator. All drinking water systems are also required to have a licensed backup or substitute operator. Operators are licensed by the Idaho State Board of Drinking Water and Wastewater Professionals.

Water systems serving fewer than 10,000 persons are considered to be small systems. IDAPA 58.01.08.005(02)(b) (IDAPA, 2008b) and 40 CFR 142 (CFR, 2008r) provide authorization for obtaining variances from the requirement to comply with Maximum Contaminant Level (MCL) or treatment techniques to systems serving fewer than 10,000 persons. Although a permit is not required for a drinking system serving fewer than 10,000 persons, the IDEQ requires a

Insert A

IDAPA 58.01.01.223.02.d. (IDAPA, 2008i) states that no permit to construct for toxic air pollutants is required for a source where the uncontrolled ambient concentration for all toxic air pollutants shall be less than or equal to all applicable screening emission levels listed in Sections 585 and 586.

Insert B

IDAPA 58.01.01.223.05 (IDAPA, 2008i) states that an annual certified report for the toxic pollutant exemption will be submitted to the Idaho DEQ.

Insert C

3. Based on estimated volatile organic compound (VOC) emissions from fueling operations at the onsite gasoline and diesel fueling station, the onsite fueling facility will have an emission rate for toxic air pollutants (petroleum hydrocarbons) less than the applicable screening levels.

2.1.2.3 Facility Description

The EREF is designed to separate a feed stream containing the naturally occurring proportions of uranium isotopes into a product stream enriched in ^{235}U and a uranium stream depleted in the ^{235}U isotope. Following is a summary description of the EREF process, buildings and related operation. The EREF ISA Summary contains a detailed description of facility characteristics, including plant design and operating parameters.

The feed material for the enrichment process is uranium hexafluoride (UF_6), with a natural composition of isotopes ^{234}U, ^{235}U, ^{236}U, and ^{238}U. The enrichment process involves the mechanical separation of isotopes using a fast rotating cylinder (centrifuge) and is based on a difference in centrifugal forces due to differences in the molecular weight of the uranic isotopes. No chemical or nuclear reactions take place. The feed, product, and depleted uranium streams are all in the form of UF_6.

The UF_6 feed arrives from conversion facilities as a solid under partial vacuum in 122-cm (48-in) diameter transportation cylinders. Product material is collected in 76-cm (30-in) diameter containers and transported to a fuel fabricator. The depleted UF_6 material is collected in 122-cm (48-in) diameter containers and removed for temporary storage onsite.

The plant design capacity is 6.6 million separative work units (SWU) per year i.e., a nominal 6 MSWU per year production rate. At full production in a given year, the plant will receive approximately 17,518 MT (19,310 tons) of UF_6 feed, supply 2,252 MT (2,482 tons) of low enriched UF_6, and yield 15,270 MT (16,832 tons) of depleted UF_6. The principal EREF operational structures are shown on Figure 2.1-4, EREF Buildings, and include the following:

- Separations Building Modules (includes UF_6 Handing Area, Cascade Halls, Process Service Corridor)
- Blending, Sampling and Preparation Building (BSPB)
- Technical Support Building (TSB)
- Operation Support Building (OSB)
- Centrifuge Assembly Building (CAB)
- Cylinder Receipt and Shipping Building (CRSB)
- Electrical Services Building (ESB)
- ESB for the CAB
- Mechanical Services Buildings (MSBs) – 2 Buildings
- Cylinder Storage Pads
- Administration Building
- Security and Secure Administration Building
- Guard House
- Visitor Center
- Gasoline and Diesel Fueling Station (GDFS)

Information on items used, consumed, or stored at the site during construction and operation is provided in ER Section 3.12.4, Resources and Materials Used, Consumed or Stored During Construction and Operation.

2.1.2.3.15 Gasoline and Diesel Fueling Station ~~[struck through]~~

A Gasoline and Diesel Fueling Station is located to the northeast of the CAB. The GDFS supports vehicle fueling from an adjacent fuel pump island and on-site vehicle repair and maintenance conducted inside the building.

Personnel requiring access to facility areas or the CAA must pass through the EECP. The EECP is designed to facilitate and control the passage of authorized facility personnel and visitors.

Entry to the plant area from the Security and Secure Administration Building is only possible through the EECP. Approximately 20 work locations are provided for the plant office staff. The office environment consists of private, semiprivate, and open office space. It also contains a kitchen, break room, conference rooms, building service facilities such as the janitor's closet and public telephone, and a mechanical equipment room.

2.1.2.3.12 Guard House

The Guard House is located at the entrance to the plant. It functions as a security checkpoint for all incoming and outgoing traffic. Employees, visitors and trucks that have access approval will be screened at the main Guard House.

2.1.2.3.13 Visitor Center

A Visitor Center is located outside the security fence area near Highway 20.

2.1.2.3.14 Electrical Services Building for the CAB (ESB-CAB)

The ESB-CAB houses four transformers and switchgear, which provide the CAB and the adjacent long term warehouse with power. The building contains switchgear, transformers, and control and lighting panels. The rooms are sized with adequate provisions made for maintenance, as well as equipment removal and equipment replacement.

INSERT

2.1.2.4 Process Control Systems

The EREF uses various operations and Process Controls Systems to ensure safe and efficient plant operations. The principal process systems include:

- Decontamination System
- Liquid Effluent Collection and Treatment System
- Solid Waste Collection System
- Gaseous Effluent Ventilation System
- Centrifuge Test Facility and Post Mortem Gaseous Effluent Ventilation System
- Centrifuge Test and Post Mortem Facilities Exhaust Filtration System
- Technical Support Building Contaminated Area Heating, Ventilation and Air Conditioning (HVAC) System
- Ventilated Room Heating, Ventilation and Air Conditioning (HVAC) System

2.1.2.4.1 Decontamination System

The Decontamination System is designed to remove radioactive contamination - in the form of uranium hexafluoride (UF_6), uranium tetrafluoride (UF_4) and uranyl fluoride (UO_2F_2), i.e., uranium compounds from contaminated materials and equipment. The system consists of a

Table 2.1-1 Chemical Hazard Classification [1]
(Page 1 of 2)

Chemical	Formula	Phase(s) [2]	Radioactive	Toxic	Corrosive	Water Reactive	Flammable	Combustible	Oxidizer	Other	Comments
uranium hexafluoride [3]	UF_6	S/L/G	●	●	●	●					
uranic compounds	UO_2F_2, UF_4, U_3O_8,	S/L	●	●	●	●					UF_6 reaction byproducts, deposits & in solution
hydrogen fluoride	HF	G		●	●	●					UF_6 reaction byproduct
sodium fluoride	NaF	S		●							granules
aluminum oxide (activated)	Al_2O_3	S								●	irritant, powder / granules
carbon (activated)	C	S						●			powder / granules
paper, polymers		S						●			ventilation filter media, anti-contamination clothing, ion exchange resin, etc.
potassium hydroxide	KOH	S		●	●						
phosphate		S								●	surfactant, irritant, P-3 Plastoclin 4100 B
scrap metals		S	●								contaminated scrap/parts
citric acid	$C_6H_8O_4$	S/L			●						crystals & solution (5-10%)
sodium hydroxide	NaOH	S/L		●	●						powder & solution (0.1N)
hydrocarbon oils / greases	varies	S/L						●			
hydrocarbon sludges	varies	S/L						●			
perfluoropolyether fluids	varies	L								●	irritant, long chain perfluorocarbons
methylene chloride	CH_2Cl_2	L								●	Health hazard
polydimethylsiloxane (silicone oil)	varies	L						●			
hydrocarbon / polar solvents and liquids	varies	L					●				gasoline, ethanol, acetone, toluene, petroleum ether, paint, cutting oils
nitric acid	HNO_3	L			●						(50-70%) weight concentration
hydrofluoric acid	HF (H_2O)	L			●						38% weight concentration
hydrogen peroxide	H_2O_2	L							●		
sulfuric acid	H_2SO_4	L			●						
phosphoric acid	H_3PO_4	L			●						(10-25%) weight concentration

Table 3.12-5 Commodities Used, Consumed, or Stored at the Eagle Rock Enrichment Facility During Construction

(Page 1 of 1)

Item Description	Quantity
Asphalt Paving	186,165 m^2 (222,652 yd^2)
Chain Link Fence	31,892 m (104,633 ft)
Concrete (including embedded items	198,341 m^3 (259,420 yd^3)
Concrete Paving (Sidewalks/Islands)	1,561 m^2 (1,867 yd^2)
Copper and Aluminum Wiring	619,133 m (2,031,275 ft)
Crushed Stone (roads and fencing)	313,174 m^2 (374,553 yd^2)
Electrical Conduit	272,461 m (893,900 ft)
Fence Gates	16 each
HVAC Units	150 each
Permanent Metal Structures	(1) Cylinder Receipt and Shipping Building
Piping (Carbon & Stainless Steel & Non-Metallic)	49,621 m (162,800 ft)
Roofing Materials	86,147 m^2 (927,279 ft^2)
Ductwork	1,133,981 kg (2,500,000 lbs)

Gasoline	<206,684 L (54,600 gal)
Diesel Fuel	< 5,905,242 L (1,560,000 gal)

Table 3.12-6 Commodities Used, Consumed, or Stored at the Eagle Rock Enrichment Facility During Operation
(Page 1 of 1)

Item	Quantity	Comments
Electrical Power	64 MVA	Separation Plant
Diesel Fuel	302,832 L (80,000 gal)	Periodic start tests and runs of standby diesel generators
Silicon Oil	100 L (26.4 gal)	–
Corrosion Inhibitor	None Expected	–
Growth Inhibitor	1,471 kg (3,244 lb)	Water systems biocide: consumed, not stored on site

Gasoline	29,526 L (7,800 gal)	On-site vehicle fuel
Diesel Fuel	29,526 L (7,800 gal)	On-site vehicle fuel

stormwater diversions. The purpose of the diversions is to divert surface runoff away from the EREF structures during extreme precipitation events. Retention or attenuation of flows in the diversions is not expected. Since there are no modifications or attenuation of flows, there are no adverse impacts and no mitigative measures will be required.

4.4.7.1 Mitigations

Mitigation measures will be in place to minimize potential impacts on water resources during construction and operation. These include employing BMPs and the control of hazardous materials and fuels. In addition, the following controls will also be implemented:

- Construction equipment will be in good repair without visible leaks of oil, grease, or hydraulic fluids.
- The control and mitigation of spills during construction will be in conformance with the SPCC plan.
- Use of the BMPs will control stormwater runoff to prevent releases to nearby areas to the extent possible. See ER Section 4.1.1, Construction Impacts, for descriptions of construction BMPs.
- BMPs will also be used for dust control associated with excavation and fill operations during construction. Water conservation will be considered when deciding how often dust suppression sprays will be applied.
- Silt fencing and/or sediment traps will be used.
- External vehicle washing will use only water (no detergents).
- Stone construction pads will be placed at entrance/exits if unpaved construction access adjoins a state road.
- All temporary construction and permanent basins will be 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 NPDES – Construction General Permit requirements and by applying BMPs as detailed in the site SWPPP.
- A SPCC plan will be implemented for the facility to identify potential spill substances, sources and responsibilities.
- All above-ground diesel storage tanks will be bermed or self contained.
- Any hazardous materials will be handled by approved methods and shipped off site to approved disposal sites. Sanitary wastes generated during site construction will be handled by portable systems until the Domestic Sanitary Sewage Treatment Plant is available for site use. An adequate number of these portable systems will be provided.
- The Liquid Effluent Collection and Treatment System will use evaporators, eliminating the need to discharge treated process water to an on-site basin.
- Control of surface water runoff will be required for activities covered by the NPDES Construction General Permit.

The proposed EREF is designed to minimize the use of water resources as shown by the following measures:

The results of the air quality impact analysis of the EREF construction site preparation activities are presented in Table 4.6-3, Results of Air Quality Impact AERMOD Dispersion Modeling for EREF Construction Site Preparation Activity. All predicted concentrations shown in Table 4.6-3, Results of Air Quality Impact AERMOD Dispersion Modeling for EREF Construction Site Preparation Activity, include the appropriate ambient background level noted in Table 4.6-2, Background Air Quality Concentrations for AERMOD Modeling Analysis. No NAAQS has been set for hydrocarbons; however, the total annual emissions of hydrocarbons predicted from the site (approximately 4,045 kg (4.5 tons)) are well below the level of 36,287 kg (40 tons) that defines a significant source of volatile organic compounds (40 CFR 52.21(b)(23)(i)) (CFR, 2008qq).

As shown in Table 4.6-3, Results of Air Quality Impact AERMOD Dispersion Modeling for EREF Construction Site Preparation Activity, the maximum predicted one-hour and eight-hour CO concentrations for the EREF construction site preparation were 4.6 ppm and 2.1 ppm, respectively. All CO concentrations were generated by vehicle exhaust from support vehicles and construction equipment utilized on-site. None of the modeled CO concentrations exceed the NAAQS noted in Table 4.6-3, Results of Air Quality Impact AERMOD Dispersion Modeling for EREF Construction Site Preparation Activity.

The maximum predicted annual nitrogen dioxide (NO_2) concentration was estimated to be 11.6 $\mu g/m^3$. As with CO concentrations, all NO_2 concentrations were generated from vehicle exhaust and do not exceed the NAAQS.

For SO_2 concentrations, the estimated maximum annual concentration was 15.7 $\mu g/m^3$, 63.4 $\mu g/m^3$ for the 24-hour averaging period, and 163.1 $\mu g/m^3$ for the 3-hour averaging period. SO_2 concentrations were generated by vehicle exhaust from construction equipment. None of the predicted SO_2 concentrations exceeded the NAAQS.

PM_{10} concentrations were mainly generated by fugitive dust caused by construction activity. To a lesser extent, vehicle exhaust from construction equipment contributed to the PM_{10} concentrations. As can be seen in Table 4.6-3, Results of Air Quality Impact AERMOD Dispersion Modeling for EREF Construction Site Preparation Activity, the maximum predicted annual PM_{10} concentration was 25.8 $\mu g/m^3$ while the 24-hour PM_{10} concentration was estimated to be 150 $\mu g/m^3$. The NAAQS for the annual averaging period was revoked in 2006 and therefore does not apply. The 24-hour PM_{10} concentration is at the NAAQS but does not exceed the limit noted in Table 4.6-3, Results of Air Quality Impact AERMOD Dispersion Modeling for EREF Construction Site Preparation Activity. This maximum 24-hour PM_{10} concentration is predicted to occur at a location on the property boundary that is closest to the southwest portion of the area of disturbance.

Predicted maximum $PM_{2.5}$ annual concentrations were estimated to be 7.1 $\mu g/m^3$ and the 24-hour concentration was 30 $\mu g/m^3$. These concentrations do not exceed the annual and 24-hour NAAQS shown in Table 4.6-3, Results of Air Quality Impact AERMOD Dispersion Modeling for EREF Construction Site Preparation Activity. Fugitive dust generated by construction activity and vehicle exhaust is a contributor to the $PM_{2.5}$ concentrations.

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 the EREF will 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 the standby diesel generators. Construction emission types, source locations, and emission quantities are presented in Table 4.6-4, Construction Emission Types.

Petroleum hydrocarbon emissions from the Gasoline and Diesel Fueling Station are estimated at 298 kg (657 lb) per year.

- Emissions from the operation of four emergency generators will be small. These emission units are exempt from permitting requirements.
- Vehicular emissions are predicted to be extremely low in the vicinity of the site.
- Emissions of hazardous air pollutants are predicted to be insignificant and are well below permitting thresholds.

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 19.5 MBq (528 μCi) per year for the purposes of bounding routine operational impacts. European experience indicates that uranium discharges from gaseous effluent ventilation systems are less than 20 g (0.71 ounces) per year. Therefore, 19.5 MBq (528 μCi) is a very conservative estimate and is consistent with an NRC estimate (NRC, 1994) for a 6.6 million SWU plant that has been scaled for the 3.3 million SWU EREF.

Nonradioactive gaseous effluents include hydrogen fluoride (HF), ethanol, ~~and~~ methylene chloride, and petroleum hydrocarbons. HF releases are estimated to be 2.0 kg (4.4 lbs) each year. Approximately 173 kg (382 lbs) and 1,684 kg (3,713 lbs) of ethanol and methylene chloride, respectively, are estimated to be released each year. These values are based on European operational experience.

In addition, on-site diesel engines include four standby diesel generators for use as standby power sources, a security diesel generator, and a fire pump diesel. Their use will be administratively controlled (i.e., only run a limited number of hours per year to limit emissions) and are exempt from air permitting requirements of the state of Idaho (IDAPA, 2008i).

4.6.2.2 Description of Gaseous Effluent Ventilation Systems and Exhaust Filtration Systems

The principal functions of the gaseous effluent ventilation system (GEVS) is to protect both the operator during connection/disconnection of 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 UF_6, hydrogen fluoride (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 ten Gaseous Effluent Ventilation Systems for the plant: (1) the Separations Building Modules (SBM) Safe-by-Design GEVS (one in each of the four modules), (2) the Separations Building Modules Local Extraction GEVS (one in each of the four modules), (3) the Technical Support Building (TSB) GEVS and (4) the Centrifuge Test and Post Mortem Facilities GEVS within the Centrifuge Assembly Building (CAB). In addition, the TSB, the Blending, Sampling & Preparation Building (BSPB), and the Centrifuge Test and Post Mortem Facilities have HVAC systems that function to maintain negative pressure and exhaust filtration for rooms served by these systems.

The SBM Safe-by-Design GEVS transports potentially contaminated gases to a set of redundant filters (pre-filter, high efficiency particulate air filter, potassium carbonate impregnated activated carbon filter, a final high efficiency particulate air filter) and fans. The cleaned gases

Table 4.6-4 Construction Emission Types
(Page 1 of 1)

Emission Type	Source Location	Quantity
Fugitive Dust PM_{10} $PM_{2.5}$	Onsite	21.8 g/s (172.7 lb/hr) 3.3 g/s (25.9 lb/hr)
Vehicle Exhaust	Onsite	4,045 kg/yr (4.5 tons/yr)
Paint Fumes	Onsite buildings	NA[1]
Welding Torch Fumes	Onsite buildings	NA[1]
Solvent Fumes	Onsite buildings	NA[1]
Petroleum Hydrocarbons	Gasoline and Diesel Fueling Station	392 kg/yr (865 lb/yr)
Air Compressors	NA[1]	NA[1]
Portable Generators	NA[1]	NA[1]
Standby Diesel Generator Exhaust[2]	Electrical Services Building	61 kg/yr (0.067 ton/yr) of PM_{10} 8,437 kg/yr (9.3 ton/yr) of NO_x 726 kg/yr (0.80 ton/yr) of CO 168 kg/yr (0.185 ton/yr) of VOC

Notes:

[1]Information is not available at this time.

[2]*This emission category includes emissions from four (4)* 2,500 kW *standby diesel generators* and two (2) smaller diesel generators (security diesel generator and fire pump diesel). For the purpose of calculating aggregate emissions from this emission category, it was conservatively assumed that all six generators each had a capacity of 2,500 kW and that each generator was tested for 1.6 hours per week for 52 weeks per year.

A small quantity of VOCs will also be emitted during vehicle refueling that will occur during construction and plant operations.

1 These effluents are significantly below regulatory limits. Mitigation measures associated with air quality impacts are listed in Section 5.2.6, Air Quality.

5.1.7 Noise

The potential impacts related to noise generated by the facility have been characterized in Section 4.7, Noise Impacts. No substantive impacts will exist related to the following activities:

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

Noise levels will increase during construction and operation of the EREF, but not to a level that will cause significant impact to nearby residents or users of the Bureau of Land Management Hell's Half Acre Wilderness Study Area (WSA) and the Wasden Complex. The nearest residence is about 7.7 km (4.8 mi) east of the proposed site. While the WSA borders the south boundary of the site, the WSA is approximately 2.4 km (1.5 mi) away from the proposed EREF footprint. Mitigation measures associated with noise impacts are listed in Section 5.2.7, Noise.

5.1.8 Historical and Cultural Resources

The potential impacts to historical and cultural resources have been characterized in Section 4.8, Historical and Cultural Resources Impacts. No substantive impacts are anticipated pursuant 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.

Most of the facilities, when constructed, would be obscured due to an intervening ridgeline and due to distance from the EREF. Construction activities would also be difficult to observe due to these topographical features. As a result of consultation between AES and the Idaho State Historic Preservation Officer, AES is considering planting 0.6 m to 0.9 m (2 ft. to 3 ft.) tall native vegetation to further mask the portions of the EREF buildings that may be visible from the Wasden Complex. Within the EREF area of direct effects, impacts to historical and cultural resources are expected to be small. Mitigation measures associated with these impacts, if required, are listed in Section 5.2.8, Historical and Cultural Resources.

5.1.9 Visual/Scenic Resources

The potential impacts to visual/scenic resources have been characterized in Section 4.9, Visual/Scenic Resources Impacts. No substantive negative impacts will exist related to the following:

- Impacts on 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.

- BMPs will also be used for dust control associated with excavation and fill operations during construction. Water conservation will be considered when deciding how often dust suppression sprays will be applied.
- Silt fencing and/or sediment traps will be used.
- External vehicle washing will use only water (no detergents).
- Stone construction pads will be placed at entrance/exits where unpaved construction access adjoins a state road.
- All temporary construction and permanent basins will be 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 (NPDES) - Construction General Permit requirements and by applying BMPs as detailed in the site Stormwater Pollution Prevention Plan (SWPPP).
- A SPCC plan will be implemented for the facility to identify potential spill substances, sources, and responsibilities.
- All above ground gasoline and diesel fuel storage tanks will be bermed or self contained.
- Any hazardous materials will be handled by approved methods and shipped off site to approved disposal sites. Sanitary wastes generated during site construction will be handled by portable systems until the Domestic Sanitary Sewage Treatment Plant is available for site use. An adequate number of these portable systems will be provided.
- The Liquid Effluent Collection and Treatment System will use evaporators, eliminating the need to discharge treated process water to an on-site basin.
- Water from the EREF Domestic Sanitary Sewage Treatment Plant will meet required levels for all contaminants stipulated in any permit or license required for that activity.
- Control of surface water runoff will be required for activities covered by the NPDES Construction General Permit.

The proposed EREF will be designed to minimize the use of 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.
- Localized floor washing using mops and self-contained cleaning machines reduces water usage compared to conventional washing with a hose.
- Laundry services will not be performed on site resulting in use of less water and laundry wash water will not have to be treated and disposed.
- Closed-loop cooling systems have been incorporated to reduce water usage.
- Cooling towers will not be used resulting in the use of less water since evaporative losses and cooling tower blowdown are eliminated.

The facility design will include two types of basins. The Site Stormwater Detention Basin will collect runoff from parking lots, roofs, roads, landscaped areas and diversions from unaltered

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

5.2.6 Air Quality

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

- The SBM Safe-by-Design GEVS and SBM Local Extraction GEVS 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 hydrogen fluoride (HF) in the exhaust system that will trip the system to a safe condition in the event of effluent detection beyond routine operational limits.
- The TSB GEVS is designed to collect and clean all potentially hazardous gases from the serviced areas in the TSB 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.
- The Centrifuge Test and Post Mortem Facilities GEVS is designed to collect and clean all potentially hazardous gases from the serviced areas in the Centrifuge Assembly Building 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.
- The TSB Contaminated Area HVAC, the Ventilated Room HVAC System in the BSPB, and the Centrifuge Test and Post Mortem Facilities Exhaust Filtration System are designed to collect and clean all potentially hazardous gases from the serviced areas prior to release into the atmosphere.
- Construction BMPs will be applied to minimize fugitive dusts.
- Applying gravel to the unpaved surface of secondary access road.
- Imposing speed limits on unpaved secondary access road.
- Air concentrations of the Criteria Pollutants resulting from vehicle emissions and fugitive dust will be below the National Ambient Air Quality Standards.

5.2.7 Noise

Mitigation of the operational noise sources will occur primarily from the plant design, whereby cooling systems, valves, transformers, pumps, generators, and other facility equipment, will mostly reside inside plant structures. The buildings themselves will absorb the majority of the noise located within. Natural land contours, vegetation (such as scrub brush), and site buildings and structures will mitigate the impact of other equipment located outside of structures that contribute to site noise levels.

The nearest home is located approximately 7.7 km (4.8 mi) east of the proposed site; and the Bureau of Land management Hell's Half Acre Wilderness Study Area (WSA) is located immediately south of the proposed site. Both the residence and the WSA are near U.S.

Fuel dispensing at the Gasoline and Diesel Fueling Station will be via automated, approved dispensing equipment to minimize emissions and spill potential.

the facility or prior to the storage of oil on site in excess of de minimis quantities and will contain the following information:

- Identification of potential significant sources of spills and a prediction of the direction and quantity of flow that will likely result from a spill from each source.
- Identification of the use of containment or diversionary structures such as dikes, berms, culverts, booms, sumps, and diversion ponds at the facility to control discharged oil.
- Procedures for inspection of potential sources of spills and spill containment/diversion structures.
- Assigned responsibilities for implementing the plan, inspections, and reporting.
- As part of the SPCC Plan, other measures will include control of drainage of rain water from diked areas, containment of oil, gasoline, and diesel fuel in bulk storage tanks, above ground tank integrity testing, and oil, gasoline, and diesel fuel transfer operational safeguards.

Currently, the EREF construction plan has not been developed enough to determine how much of construction debris will be recycled. As such, there is no plan in place at this time to recycle construction materials. A construction phase recycling program will be developed as the construction plan progresses to final design.

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

Table 7.1-5 Total Annual Impact of EREF Purchases During Operations in the 11-County Area (Page 1 of 1)

Item	Local Purchases	Final Demand Multipliers			Total Impact		
	(Direct Impact-2007 dollars-Provided by AES)	Output	Earnings	Employment*	Output	Earnings	Employment
Landscaping	$60,000	1.7339	0.5908	33.0365	$104,034	$35,448	2
Protective Clothing	$72,000	1.4548	0.3210	10.6240	$104,746	$23,112	1
Laboratory Chemicals	$140,000	1.9313	0.3405	9.1357	$270,382	$47,670	1
Plant Spare Equipment	$500,000	1.4839	0.3308	9.5108	$741,950	$165,400	5
Office Equipment	$183,000	1.6636	0.4518	15.1490	$304,439	$82,679	3
Engineered Parts	$400,000	1.5593	0.4076	10.9617	$623,720	$163,040	4
Electrical/Electronic Parts	$640,000	1.6299	0.4222	10.1705	$1,043,136	$270,208	7
Electricity	$18,500,000	1.4492	0.3282	6.8767	$26,810,200	$6,071,700	127
Natural Gas	$0	1.4756	0.2690	5.8119	$0	$0	0
Waste Water	$170,000	1.6529	0.4546	13.2552	$280,993	$77,282	2
Solid Waste Disposal	$60,000	1.8148	0.5391	17.5413	$108,888	$32,346	1
Insurance	$0	1.6957	0.4722	13.6573	$0	$0	0
Catering	$92,000	1.8266	0.6153	43.9806	$168,047	$56,608	4
Building Maintenance	$650,000	1.7339	0.5908	33.0365	$1,127,035	$384,020	21
Custodial Services	$3390,000	1.7339	0.5908	33.0365	$676,221	$230,412	13
Professional Services	$360,000	1.7562	0.6916	18.9169	$632,232	$248,976	7
Security Services	$942,500	1.7204	0.7588	39.8107	$1,621,477	$715,169	38
Mail, Document Services	$170,000	1.6236	0.5383	25.3657	$276,012	$91,511	4
Office Supplies	$236,000	1.6580	0.5356	23.0050	$391,288	$126,402	5
Diesel **	$205,000	1.6300	0.5112	14.6460	$334,150	$104,769	3
Total	$23,770,500	* The employment multiplier is measure on the basis of $1-million change in output delivered to final demand			**$35,618,950**	**$8,926,779**	**248**

** This is diesel fuel consumed by on-site diesel generators. Vehicle fuel purchases are not included in this Table.

emergency purposes. Their use will be administratively controlled and they will only run a limited number of hours per year. As a result, these engines will be exempt from air permitting requirements of the State of Idaho. Due to their limited use, the diesel generators will have negligible health and environmental impacts.

INSERT ER 7.2.2.3 (attached)

7.2.2.4 Visual/Scenic

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

7.2.2.5 Socioeconomics

AREVA Enrichment Services (AES) applied the Regional Input-Output Modeling System (RIMS) II to estimate the socioeconomic impact from operation of the EREF. The results of the analysis are presented below and are in 2007 dollars. The EREF is expected to employ up to 550 people in high paying jobs relative to the region. Its operation's payroll will generate $36.3 million annually in earnings for households and another $82.8 million in additional household earnings due to indirect impacts. Annual purchases for goods and services are expected to add another $8.9 million in household income for a total increase in household earnings of $128.0 million. An annual increase of 2,987 indirect new jobs (3,537 minus the 550 direct jobs at the EREF) is anticipated during operation.

In general, no significant impacts are expected to occur on population characteristics, economic trends, housing, community services and the tax structure and tax distribution in Bonneville and Bingham Counties.

7.2.2.6 Radiological Impacts

Potential radiological impacts from operation of the EREF would result from controlled releases of small quantities of UF_6 during normal operations and releases of UF_6 under hypothetical accident conditions. As described in ER 4.12.2, Radiological Impacts, the major sources of potential radiation exposure are the gaseous effluent from the Separations Buildings, Technical Support Building and direct radiation from the Cylinder Storage Pads. It is anticipated that the total amount of uranium released to the environment via airborne effluent discharges from the EREF will be less than 20 grams (13.7 μCi or 0.506 MBq) per year. Due to the anticipated low volume of contaminated liquid waste and the effectiveness of the treatment processes, no waste in the form of liquid effluent are expected.

The estimated maximum annual effective dose equivalent and maximum annual organ (lung) committed dose to transient individuals at the maximum site boundary for the ground plane (NNE sector at 1.1 km (0.67 mi)), cloud immersion (N sector at 1.1 km (0.67 mi)), and inhalation exposure (N sector at 1.1 km (0.67 mi)) pathways are 1.5 E-04 mSv/yr (1.5 E-02 mrem/yr) and 1.2 E-03 mSv/yr (1.2E-01 mrem/yr), respectively. Although there are no residences within 8 km (5 mi) from the center of the EREF structures, for a hypothetical residence at the site boundary, the maximum annual effective dose equivalent and maximum annual organ dose (lung) to an individual for all airborne exposure pathways are 8.8 E-04 mSv/yr (8.8E-02 mrem/yr) and 6.4 E-03 mSv/yr (6.4 E-01 mrem/yr), respectively.

The dose equivalent due to external radiation (direct and sky shine) from the Full Tails, Full Feed, and Empty Cylinder Storage Pads and direct dose from product cylinders stored on the Full Product Cylinder Storage Pad, to an individual (2,000 hrs/yr) at the maximum impacted site

1a

INSERT ER 7.2.2.3

An onsite fueling facility consisting of two 2,000-gallon above ground storage tanks, dispenser pumps, and appurtenances will service the facility. One above ground tank will store unleaded gasoline. The other above ground tank will store diesel fuel. Because of the low estimated petroleum hydrocarbon emissions from the fueling facility and the associated estimated ambient air concentrations, the fueling facility is exempt from air permitting requirements of the State of Idaho and presents no significant impact to the environment.

, including hydrocarbon emissions from the onsite fueling facility,

Insert

1.0 INTRODUCTION

Refined dispersion modeling was performed in order to demonstrate that air quality impacts from construction site preparation activities at the proposed Eagle Rock Enrichment Facility (EREF) will not cause exceedances of any National Ambient Air Quality Standards (NAAQS) (CFR, 2008a). The dispersion modeling analysis includes combustion sources, such as support vehicles and construction equipment and fugitive dust generated by activity on unpaved surfaces onsite. This report describes the specific dispersion modeling methods and procedures used in this analysis, which is consistent with the Environmental Protection Agency (EPA) Guideline on Air Quality Models (40 CFR Part 51, Appendix W (CFR, 2008b) and with other modeling guidance. Air quality impacts from the construction activity were determined for the following criteria air pollutants: carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2) and particulate matter (PM_{10} and $PM_{2.5}$). There are no NAAQS for hydrocarbon emissions. As such, hydrocarbon emissions are not included in this Appendix B. Hydrocarbon emissions are discussed in Section 4.6, Air Quality Impacts.

2.0 SITE DESCRIPTION

The proposed EREF is located along Route 20 approximately 300 km (186 mi) east of Boise, Idaho. *The topography of the site is primarily flat in relation to the property line receptors and* the construction site preparation area. Even though the terrain is unlikely to have a significant effect on plume transport and dispersion, terrain elevations were included in the modeling analysis.

3.0 MODELING METHODOLOGY

3.1 SELECTION OF DISPERSION MODEL

For this modeling analysis, the latest version of the EPA's AERMOD modeling system (version 07026) (EPA, 2008a) was used. AERMOD is a refined, steady-state, multi-source, Gaussian dispersion model that is EPA's preferred model for a wide range of regulatory applications in all types of terrain.

The AERMOD modeling system also includes the following major components:

- AERMET – The AERMOD system's general purpose meteorological preprocessor that organizes and processes meteorological data and estimates the boundary layer parameters necessary for dispersion calculations.
- AERMAP – The AERMOD system's terrain preprocessor module that processes digitized terrain elevation data files to produce terrain base elevations and hill height scale values for each receptor.
- AERSURFACE – A recently developed tool to aid in obtaining realistic and reproducible surface characteristic values for albedo, Bowen ratio, and surface roughness length for AERMET.

All modeling was performed using AERMOD's regulatory default option.

3.2 METEOROLOGICAL DATA AND SURFACE CHARACTERISTICS

The AERMOD modeling analysis was performed using five years (1988-1992) of hourly surface meteorological data from the National Weather Service (NWS) station at Pocatello Municipal Airport in Pocatello, Idaho and concurrent upper air sounding data collected at the Boise

Gasoline and Diesel Fueling Station (GDFS)

A Gasoline and Diesel Fueling Station is located to the northeast of the CAB. The GDFS supports vehicle fueling from an adjacent fuel pump island and on-site vehicle repair and maintenance conducted inside the building.

Mechanical Services Buildings (MSBs)

The two MSBs are located south of the SBMs. They house air compressors, the demineralized water system, the centrifuge cooling water system pumps, heat exchangers, and expansion tanks. The MSB is presented in Figure 1.1-15.

Electrical Services Building for the CAB

An Electrical Services Building that supports the CAB (ESB-CAB) is located to the east of the CAB. The ESB-CAB houses four transformers and switchgear, which provide the CAB and the adjacent long term warehouse with power. The ESB-CAB also contains control and lighting panels. The ESB-CAB is presented in Figure 1.1-17.

Visitor Center

A Visitor Center is located outside the security fence area near Highway 20.

1.1.3 Process Descriptions

This section provides a description of the various processes analyzed as part of the Integrated Safety Analysis. A brief overview of the entire enrichment process is provided followed by an overview of each major process system.

1.1.3.1 Process Overview

The enrichment process at the EREF is basically the same process described in the SAR for the National Enrichment Facility (LES, 2005). The Nuclear Regulatory Commission (NRC) staff documented its review of the National Enrichment Center license application and concluded that LES's application provided an adequate basis for safety and safeguards of facility operations and that operation of the National Enrichment Facility would not pose an undue risk to worker and public health and safety (NRC, 2005). The design of the EREF incorporates the latest safety improvements and design enhancements from the enrichment facilities currently operating and under construction in Europe.

The primary function of the facility is to enrich natural uranium hexafluoride (UF_6) by separating a feed stream containing the naturally occurring proportions of uranium isotopes into a product stream enriched in ^{235}U and a tails stream depleted in the ^{235}U isotope. The feed material for the enrichment process is uranium hexafluoride (UF_6) with a natural composition of isotopes ^{234}U, ^{235}U, and ^{238}U. The enrichment process is a mechanical separation of isotopes using a fast rotating cylinder (centrifuge) based on a difference in centrifugal forces due to differences in molecular weight of the uranic isotopes. No chemical changes or nuclear reactions take place. The feed, product, and tails streams are all in the form of UF_6.

1.1.3.2 Process System Descriptions

An overview of the enrichment process systems and the enrichment support systems is discussed below.

Numerous substances associated with the enrichment process could pose hazards if they were released into the environment. Chapter 6, Chemical Process Safety, contains a discussion of the criteria and identification of the chemicals of concern at the EREF and concludes that uranium hexafluoride (UF_6) is the only chemical of concern that will be used at the facility. Chapter 6, Chemical Process Safety, also identifies the locations where UF_6 is stored or used in

- The Gasoline and Diesel Fueling Station is designed to meet the construction type, occupancy, and exiting requirements of the IBC (ICC, 2006)
- The Gasoline and Diesel Fueling Station is designed to resist the normal load conditions as defined by the IBC (ICC, 2006), using structural steel framing.
- The two Mechanical Services Buildings are designed to meet the construction type, occupancy and exiting requirements of the IBC (ICC, 2006).
- Each Mechanical Services Building structure is designed to resist the normal load conditions as defined by the IBC (ICC, 2006), using structural steel framing.
- The Administration Building is designed to meet the construction type, occupancy and exiting requirements of the IBC (ICC, 2006).
- The Administration Building superstructure is designed to resist normal load conditions as defined by the IBC (ICC, 2006), using structural steel framing.
- The Security and Secure Administration Building is designed to meet the construction type, occupancy and exiting requirements of the IBC (ICC, 2006).
- The Security and Secure Administration Building structure is designed to resist normal load conditions as defined by the IBC (ICC, 2006), using structural steel framing.
- The Guard House is designed to meet the occupancy and exiting requirements set by the IBC (ICC, 2006).
- The Guard House structure is designed to resist normal load conditions as defined by the International Building Code (ICC, 2006), using structural steel framing.
- The Visitor Center will be a commercial building constructed to the provisions of the local building code.

3.3.4 Structural Design Criteria

- As part of the Integrated Safety Analysis for external events, the following structures (buildings and areas) were determined to be required to withstand the design basis natural phenomena hazards and external hazards defined in the ISA Summary:
  - Separations Building Modules (UF_6 handling area, process service corridors, and cascade halls including the link corridors, electrical support rooms and second floor mechanical rooms)
  - BSPB
  - Cylinder Receipt and Shipping Building
  - TSB
- The above structures shall be designed to withstand the effects of external events (i.e., seismic, winds, snow, and local intense precipitation).
- The determination of normal wind pressure loadings and the design for wind loads for all structures and structural components exposed to wind are based on the requirements of the IBC (ICC, 2006), Section 1609 which further refers to the wind design requirements of ASCE 7-05, Chapter 6.0 (ASCE, 2005a).
- The structures and components listed above exposed to wind are designed to withstand the Extreme Environmental wind as defined in the ISA Summary Section.
- Protection against flooding is provided by establishing the facility floor level at 0.15 m (0.5 ft) above the high point of the finished grade elevation and all roads are set below this. At roof access doors, the door threshold is set at least 0.15 m (0.5 ft) above the top of the roofing material.

7.3 FACILITY DESIGN

The design of the facility incorporates the following:

- Liimits on areas and equipment subject to contamination
- Design of facilities, equipment, and utilities to facilitate decontamination.

7.3.1 Building Construction

The facility consists of several different process-related buildings and functional areas:

Separations Building Modules (SBMs) which include the following areas:

  - Cascade Halls
  - Process Service Corridor
  - Link Corridor
  - Electrical and Mechanical Equipment Rooms
- UF_6 Handling Area
- Cylinder Receipt and Shipping Building (CRSB)
- Blending, Sampling, and Preparation Building (BSPB)
- Centrifuge Assembly Building (CAB)
- Full Feed, Full Product, Full Tails, and Empty Cylinder Storage Pads
- Technical Support Building (TSB)
- Operation Support Building (OSB)

There are also numerous utility support and non-process structures and areas including:

- Electrical Services Building (ESB)
- Electrical Services Building for the Centrifuge Assembly Building
- Mechanical Services Buildings (MSBs)
- Visitor Center
- Guard House
- Administration Building
- Security and Secure Administration Building
- Long and Short-Term Warehouses
- Electrical Switchyard
- Domestic Sanitary Sewage Treatment Plant
- Fire, Process, and Domestic Water Tanks and Pump Buildings
- Fuel Oil Storage Tanks
- Liquid Nitrogen (N_2) Package
- Gasoline and Diesel Refueling Station

The SBMs, UF_6 Handling Area, BSPB, TSB, and OSB are protected steel frame buildings with insulated metal panel exterior walls. Structural elements of these buildings are protected structural steel columns and trusses with built-up composite roofing on metal deck. Select interior walls are concrete or masonry as required by code or to support equipment loads. These process buildings all share at least one wall. Accordingly, to meet building code allowable area requirements, these are classified as Type IB in accordance with the IBC (ICC, 2006). This is equivalent to Type II, 222 construction per NFPA 220 (NFPA, 2006c).

The CRSB is separated from the other process buildings and will also be a protected steel frame building with insulated metal panel exterior walls and protected columns and trusses with built-up composite roofing on metal deck meeting Type IB construction requirements.

The CAB will be an unprotected steel frame building with insulated metal panel exterior walls and with built-up composite roofing on metal deck. This construction is classified as non-combustible Type IIB in accordance with the International Building Code (IBC) (ICC, 2006). This is equivalent to Type II, 000 construction per NFPA 220 (NFPA, 2006c). The CAB shares a portion of one wall with the SBMs. The separating construction at this interface will be fire-rated as required to separate the CAB from the adjoining process structures.

The remaining utility and non-process related structures including the Visitor Center, Security Buildings, Administration Building, Warehouses, Electrical and Mechanical Services Buildings, a Sanitary Sewage Treatment Plant are all independent from the main plant process buildings. These structures will be unprotected steel frame buildings with insulated metal panel exterior meeting Type IIB construction.

All of the cylinder storage pads are open lay-down areas each consisting of a concrete pad with a dedicated collection and drainage system. Concrete saddles are used for fixed location storage of cylinders. Other stillages or stops may be used for interim storage or to secure cylinders temporarily during movement. There are no structures over any of the cylinder storage pads.

7.3.2 Fire Area Determination and Fire Barriers

The facility is subdivided into fire areas by barriers with fire resistance as required by the IBC (ICC, 2006), as required for specific hazards (e.g., National Electrical Code, NFPA 70 (NFPA, 2008c) requirements for transformer vaults), or as determined necessary by the FHA to ensure licensed material safety consistent with the ISA. The design and construction of fire barrier walls is in accordance with NFPA 221 (NFPA, 2006d). These fire areas are provided to limit the spread of fire, protect personnel and limit the consequential damage to the facility. Fire barriers for the main process structures are shown in Figures 7.3-1 through 7.3-8 . The fire resistance rating of fire barrier assemblies is determined through testing in accordance with NFPA 251 (NFPA, 2006e). Openings in fire barriers are protected consistent with the designated fire resistance rating of the barrier. Penetration seals provided for electrical and mechanical openings are listed to meet the guidance of ASTM E-814-02 (ASTM, 2002) or UL 1479 (UL, 2003). Penetration openings for ventilation systems are protected by fire dampers having a rating matched to that of the barrier per code. Door openings in fire rated barriers are protected with fire rated doors, frames and hardware in accordance with NFPA 80 (NFPA, 2007g).

7.3.3 Electrical Installation

All electrical systems at the facility are installed in accordance with NFPA 70 (NFPA, 2008c). Switchgear, motor control centers, panel boards, variable frequency drives, uninterruptible power supply systems and control panels are mounted in metallic enclosures and contain

7.3.9 Hydrogen Control

Hydrogen is used as an analytical gas in laboratories. In order to prevent the possibility of fire or explosion in the laboratory areas where hydrogen might accumulate will be protected by one or a combination of following features:

- Hydrogen piping will be provided with excess flow control.
- Hydrogen supply will be isolated by emergency shutoff valves interlocked with hydrogen detection in the area(s) served by the hydrogen piping.
- Natural or mechanical ventilation will be provided to ensure that hydrogen concentrations do not exceed 25% of the lower explosive limit. If mechanical ventilation is provided, it will be continuous or will be interlocked to start upon the detection of hydrogen in the area. Mechanical ventilation will also be provided with airflow sensors to sound an alarm if the fan becomes inoperative.

Hydrogen may also be generated at battery charging stations in the facility. In order to prevent the possibility of explosion or fire, areas where hydrogen might accumulate will be protected by a design which incorporates the following measures, as necessary, that are identified in NFPA 70E (NFPA, 2004a) and/or ANSI-C2, National Electrical Safety Code (ANSI/IEEE, 2007).

- Natural or mechanical ventilation will be provided to ensure that hydrogen concentrations do not exceed 25% of the lower explosive limit. If mechanical ventilation is provided, it will be continuous or will be interlocked to start upon the detection of hydrogen in the area. Mechanical ventilation will also be provided with airflow sensors to sound an alarm if the fan becomes inoperative.

7.3.10 Diesel Fuel Oil and Gasoline Storage

INSERT B

Diesel fuel oil is stored in exterior aboveground tanks to supply the facility standby diesel generators. These tanks will be provided with suitable separation, spill containment, and other protection features as required for "aboveground storage tanks" as defined in NFPA 30 (NFPA, 2008b).

The storage tanks are located over 50 m (164 ft) from the nearest building housing UF_6, over 50 m (164 ft) from cylinder trailer delivery routes, and over 150 m (492 ft) from exterior pathways where UF_6 cylinders are handled in other than interstate transport configuration. The tanks will be diked or otherwise protected to ensure spills are contained in a manner that does not threaten process structures or cylinder transport routes.

7.3.11 Environmental Concerns

Radiological and chemical monitoring and sampling will be performed as specified in EREF Environmental Report, Chapter 6, Environmental Measurements and Monitoring Programs, on the contaminated and potentially contaminated facility liquid effluent discharge including water used for fire fighting purposes. Surface water runoff will be diverted into water collection basins. Water runoff from the Full Tails Cylinder, Full Feed Cylinder, Full Product Cylinder and Empty Cylinder Storage Pads will be collected in the Cylinder Storage Pads Stormwater Retention Basins. Water runoff from the remaining portions of the site will be collected in the Site Stormwater Detention Basin.

INSERT B

Both gasoline and diesel fuel oil are stored adjacent to the Gasoline and Diesel Refueling Station ~~(Maintenance Facility~~ (GDFS). These tanks will be provided with suitable separation, spill containment, and other protection features as required for "protected, aboveground storage tanks" as defined in NFPA 30.

GDFS operations and fuel dispensing will be in accordance with requirements of NFPA 30A (NFPA, 2008g). Fuel dispensing will be done using approved, automated dispensing equipment.

NFPA, 2006c. Standard on Type of Building Construction, NFPA 220, National Fire Protection Association, 2006.

NFPA, 2006d. Standard for High Challenge Fire Walls, Fire Walls, and Fire Barrier Walls, NFPA 221, National Fire Protection Association, 2006.

NFPA, 2006e. Standard Methods of Tests of Fire Endurance of Building Construction and Materials, NFPA 251, National Fire Protection Association, 2006.

NFPA, 2007a. Standard for Portable Fire Extinguishers, NFPA 10, National Fire Protection Association, 2007.

NFPA, 2007b. Installation of Sprinkler Systems, NFPA 13, National Fire Protection Association, 2007.

NFPA, 2007c. Standard for the Installation of Standpipe, Private Hydrants and Hose Systems, NFPA 14, National Fire Protection Association, 2007.

NFPA, 2007d. Standard for the Installation of Stationary Pumps for Fire Protection, NFPA 20, National Fire Protection Association, 2007.

NFPA, 2007e. Standard for the Installation of Private Fire Service Mains and Their Appurtenances, NFPA 24, National Fire Protection Association, 2007.

NFPA, 2007f. National Fire Alarm Code®, NFPA 72, National Fire Protection Association, 2007.

NFPA, 2007g. Standard for Fire Doors and Fire Windows, NFPA 80, National Fire Protection Association, 2007.

NFPA, 2008a. Standard for Water Tanks for Private Fire Protection, NFPA 22, National Fire Protection Association, 2008.

NFPA, 2008b. Flammable and Combustible Liquids Code, NFPA 30, National Fire Protection Association, 2008.

NFPA, 2008c. National Electric Code®, NFPA 70, National Fire Protection Association, 2008.

NFPA, 2008d. Standard for the Installation of Lightning Protection Systems, NFPA 780, National Fire Protection Association, 2008.

NFPA, 2008e. Standard for Fire Protection for Facilities Handling Radioactive Materials, NFPA 801, National Fire Protection Association, 2008.

NFPA, 2008f. Standard on Carbon Dioxide Extinguishing Systems, NFPA 12, National Fire Protection Association, 2008

NFPA, 2008f. Standard on Clean Agent Fire Extinguishing Systems, NFPA 2001, National Fire Protection Association, 2008

NRC, 1995. NRC Staff Technical Position on Fire Protection for Fuel Cycle Facilities, Generic Letter 95-01, U.S. Nuclear Regulatory Commission, January 1995.

NRC, 1998. Nuclear Fuel Cycle Facility Accident Analysis Handbook, NUREG/CR-6410, U.S. Nuclear Regulatory Commission, May 1998.

NRC, 2001. Integrated Safety Analysis Guidance Document, NUREG–1513, U.S. Nuclear Regulatory Commission, May 2001.

NFPA, 2008g. Code for Motor Fuel Dispensing Facilities and Repair Garages, NFPA 30A, National Fire Protection Association, 2008.

ENCLOSURE 3.2

ER RAI 3 – MARKUP PAGES

from the date of when the exemption determination has been made or for the life of the source for which the exemption has been determined to apply, which ever is greater, or until such time as a permit to construct or an operating permit is issued which covers the operation of the source. The owner or operator shall submit the documentation to the Department upon request.

The proposed facility qualifies for these exemptions and, therefore, a permit is not required for the following reasons:

1. The six diesel generators (standby (4), security, and fire pump), will be used exclusively for emergency purposes and for the purpose of testing these generators, the generators will be meet the hours of operation for testing specified in the IDAPA 58.01.01.222.01(d) (IDAPA, 2008i). Records will be maintained to document the hours of operation for each diesel generator.
2. The six (6) diesel generators have the potential to emit less than 25 tons per year of critical air pollutants (oxides of nitrogen (NOx), carbon monoxide (CO), oxides of sulfur dioxide (SO_2), particulate matter (PM_{10}), and volatile organic compounds (VOC)).

Insert A

Idaho Water Quality Division

To implement the Safe Drinking Water Act (SDWA) requirements on a state level, the Idaho Environmental Protection and Health Act (Idaho Code Chapter 1, Title 39) (IDAHO Code, 2008c) gives the Idaho Department of Environmental Quality (IDEQ) the authority to promulgate rules governing quality and safety of drinking water (IDAPA, 2008b). The Water Quality Division (WQD) is delegated responsibility to implement the SDWA. The state 1) ensures that water systems are tested for contaminants, 2) reviews plans for water system improvements, 3) conducts on-site inspections and sanitary surveys, 4) provides training and technical assistance, and 5) takes action against water systems not meeting standards (EPA, 2004). In addition, a state has primary enforcement responsibility for drinking water systems in the state (CFR, 2008q).

Therefore, drinking water provided at the proposed facility will be governed by the SDWA as a public drinking water system. Rules governing quality and safety of drinking water in Idaho have been promulgated in IDAPA 58.01.08 (IDAPA, 2008b). No person may construct a drinking water system until it is demonstrated to the WQD that the water system will have adequate technical, financial, and managerial capacity (IDAPA, 2008b). Although there is not a permit required for a drinking water system, AES must have a drinking water facility plan that includes sufficient detail to demonstrate that the proposed project meets applicable criteria. The facility plan generally addresses the overall system-wide plan. The facility plan shall identify and evaluate problems related to the drinking water system, assemble basic information, present criteria and assumptions, examine alternative solutions with preliminary layouts and cost estimates, describe financing methods, set forth anticipated charges for users, and review organizational and staffing requirements.

The WQD requires facility owners of drinking water systems to place the direct supervision and operation of their systems under a properly licensed operator. All drinking water systems are also required to have a licensed backup or substitute operator. Operators are licensed by the Idaho State Board of Drinking Water and Wastewater Professionals.

Water systems serving fewer than 10,000 persons are considered to be small systems. IDAPA 58.01.08.005(02)(b) (IDAPA, 2008b) and 40 CFR 142 (CFR, 2008r) provide authorization for obtaining variances from the requirement to comply with Maximum Contaminant Level (MCL) or treatment techniques to systems serving fewer than 10,000 persons. Although a permit is not required for a drinking system serving fewer than 10,000 persons, the IDEQ requires a

Insert A

IDAPA 58.01.01 650 and 651 (IDAPA, 2008i) are the Idaho State air quality regulations associated with control of fugitive dusts. Those regulations state that all reasonable precautions shall be taken to prevent particulate matter from becoming airborne. Examples of reasonable precautions listed in the regulations include, use of water or chemicals, application of dust suppressants, use of control equipment, covering of trucks, paving, and removal of materials from streets.

AES will comply with IDAPA 58.01.01 Part 650 for the prevention of the generation of fugitive dusts and will prepare and implement a Dust Prevention and Control Plan in accordance with Idaho Department of Environmental Quality (IDEQ) guidance. Fugitive dust control measures will be implemented during construction of the facility to comply with these regulations.

Insert A

equipment, 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 (PM_{10}) in diameter and less than or equal to 2.5 micrometers ($PM_{2.5}$) in diameter. ~~The calculated total work day average emissions result for PM_{10} emissions was determined to be 21.8 g/s (172.7 lb/hr) and 3.3 g/s (25.9 lb/hr) for $PM_{2.5}$ emissions.~~

Fugitive air emissions were modeled as a uniform area source with emissions occurring 10 hours per day, 5 days per week, and 52 weeks per year. PM_{10} emissions from fugitive dust were also below the National Ambient Air Quality Standards (NAAQS) (CFR, 2008nn). Fugitive dust emissions estimates were assumed to occur throughout the year and a 90% reduction in the fugitive dust emissions was assumed for dust suppressant activities.

As discussed in Section 4.9, Visual/Scenic Resources Impacts, impacts to visual and scenic resources from construction of the highway entrances and access roads will include the presence of construction equipment and dust. Construction equipment will be out of character with the current uses and features of the site, and the surrounding properties. Construction of the highway entrances and access roads near U.S. Highway 20 will be most visible to the public, including traffic along U.S. Highway 20 and visitors to the Hell's Half Acre Wilderness Study Area (WSA). Road and road access construction will be relatively short-term; construction equipment will not be tall, thereby minimizing the potential for the equipment to obstruct views, and dust suppression mitigations will be used to minimize visual impacts. Therefore, impacts to visual resources from construction of the highway entrances and access roads will be small.

Noise levels up to 60 dBA are considered "clearly acceptable" under the U.S. Department of Housing and Urban Development (HUD) Land Use Compatibility Guideline for Residential and Livestock Farming Land Uses, "normally acceptable" between 60 and 65 dBA for Residential Land Uses, and "normally acceptable" between 60 and 75 dBA for Livestock Farming Land Uses. Noise levels under 55 dBA would not exceed the U.S. Environmental Protection Agency (EPA) defined goal of 55 dBA for Day-Night Average Sound Level (Ldn) for outdoor spaces (EPA, 1974). As detailed in Section 4.7, Noise Impacts, equipment used during construction of the highway entrances and access roads will generate noise levels that will range from 80 to 95 dBA at 15 m (50 ft). Maximum noise levels from construction of the proposed access roads will be about 89 dBA at the nearest site boundary, about 37 m (120 ft) west of the proposed access roads. These noise levels will only occur during construction of the access road.

Noise associated with construction of the access roads is estimated to be reduced to approximately 51 to 66 dBA at the Hell's Half Acre Wilderness Study Area (WSA) nearest trail point which is about 0.5 km (0.3 mi) from the nearest proposed highway entrance. Similarly, noise will be reduced to about 45 to 60 dBA at the WSA trailhead which is about 860 m (2,821 ft) from the nearest proposed highway entrance and noise will be reduced to about 37 to 52 dBA at the Wasden Complex archaeological sites which are about 2.3 km (1.4 mi) from the nearest portion of the proposed EREF footprint. Construction noise levels will diminish to about 46 to 61 dBA at the nearest site boundary to the proposed EREF footprint, about 762 m (2,500 ft). As a result, access road construction will be audible at the WSA and along U.S. Highway 20 during certain periods but only during construction activities associated with the highway entrances and a short portion of the access roads.

Noise from construction activities will be similar to traffic noise along U.S. Highway 20 during working hours. Noise levels recorded during peak commute times on U.S. Highway 20 were found to be 57 dBA at 15 m (50 ft) in June 2008. As a result, overall impacts from noise

Insert A

Two air dispersion modeling efforts were conducted to assess the potential air impacts during construction. The first effort modeled potential impacts to the closest downwind property line. The second effort modeled potential impacts at U.S. Highway 20, which is the major roadway to the south of the proposed site. Potential impacts at U.S. Highway 20 were assessed because U.S. Highway 20 is the closest area where the general public would have reasonable access to the site location, and therefore, is where greatest potential for exposure to emissions during construction exists.

For the evaluation of potential impacts at the property line, the total work-day average emission for PM_{10} was 13.7 g/s (108.9 lb/hr) and the total work-day average emission for $PM_{2.5}$ was 1.4 g/s (10.9 lb/hr). For the evaluation of potential receptors at U.S. Highway 20 locations the total work-day average emission was 31.8 g/s (252.4 lb/hr) and the total work-day average emission for $PM_{2.5}$ was 3.2 g/s (25.2 lb/hr).

As discussed below, higher dust emission rates were demonstrated not to exceed standards at the area where potential off-site exposures during construction are greatest, (on U.S. Highway 20). Dust emission rates that are lower than these were developed for potential property line exposures. For the potential property line exposures, it

4.6 AIR QUALITY IMPACTS

This section describes the air quality impacts of the proposed action (construction, operation, and decommissioning of the Eagle Rock Enrichment Facility (EREF)).

4.6.1 Air Quality Impacts from Construction

Air quality impacts from site preparation for the EREF were evaluated using emission factors and air quality dispersion modeling. Emission rates of criteria pollutants were estimated for exhaust emissions from construction vehicles and for fugitive dust using emission factors provided in the United States Environmental Protection Agency's (EPA) AP-42, *Compilation of Air Pollutant Emission Factors* (EPA, 2008f). The total emission rates were used to scale the output from the American Meteorological Society (AMS)/EPA Regulatory Model (AERMOD), based upon a unit source term as input to the model, to estimate both short-term and annual average ambient air concentrations at the facility property boundary. AERMOD is a refined, steady-state, multi-source, Gaussian dispersion model that is EPA's preferred model for a wide range of regulatory applications in all types of terrain (EPA, 2008g). The air emissions calculations and air dispersion modeling are discussed in more detail in Appendix B.

Emission rates from vehicle exhaust and fugitive dust, as listed in Table 4.6-1, Peak Emission Rates, were estimated for a 10-hour workday 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 fractions of total suspended particulate that are expected to be in the particulate matter less than 10 microns (PM_{10}) and particulate matter less than 2.5 microns ($PM_{2.5}$) size ranges. ~~It~~ was assumed that no more than ~~75 ha (185 ac)~~ 89 ha (221 acres) of the construction site would be involved in construction work at any one time. The area limitation on construction activities is based on the need to maintain compliance with the 24-hour PM_{10} ambient air quality standard. A more detailed discussion of this issue and a possible remedy to increase the percentage of allowable disturbed area is presented later in this section.

Of the combustion sources, vehicle exhaust will be the dominant source. Fugitive volatile emissions will occur because vehicles will be refueled on-site. Estimated vehicles that will be operating on the site during construction will consist of two types: support vehicles and construction equipment. The support vehicles will include fifty pickup trucks, forty gators (gas-powered carts), three fuel trucks, four stakebody trucks and three mechanic's trucks. Emission factors in EPA's MOBILE6.2 emission estimation model (EPA, 2003) were used to estimate emissions of criteria pollutants and non-methane hydrocarbons for these vehicles. Use of MOBILE6.2 requires that mobile sources be categorized by vehicle size. The gators were assumed to be Light Duty Vehicles, the pickup trucks and the mechanic's trucks Category I Light Duty Trucks, the stakebody trucks Category II Light Duty Trucks and the fuel trucks were assumed to be Heavy Duty Trucks. Baseline emission factors for each of the vehicle categories were provided in MOBILE6.2 as a function of the calendar year. Emission factors used included vehicle model years for the last 25 years.

The construction equipment that will be operating on the site during peak construction consists of five bulldozers, four graders, five pans (diesel-powered fill transporters), twenty dump trucks, nine backhoes, eight loaders, six rollers, four water trucks, five telehandlers, 16 manlifts, nine track drills, three 25-ton cranes and four cranes at 250-ton or greater, three concrete pump trucks, nine concrete delivery trucks and one tractor. Emission factors, in units of grams per

Insert A

hour of operation, provided in MOBILE6.2 for diesel-powered construction equipment, were compiled. In calculating emissions, it was conservatively assumed that all equipment would be in continuous operation throughout the 10-hour workday.

Emissions were modeled in AERMOD as a uniform area source with emissions occurring 10 hours per day, 5 days per week, and 52 weeks per year (Note: Construction activities are planned to occur for 50 weeks per year; however, since it was impossible to determine which two weeks of the year to eliminate from the meteorological data base, the dispersion model was conservatively run for all 52 weeks of the year). ~~The modeling analysis was performed using five years (1988-1992) of hourly surface meteorological data from the National Weather Service (NWS) station at Pocatello Municipal Airport in Pocatello, Idaho and concurrent upper air sounding data collected at the Boise International Airport in Boise, Idaho. The Pocatello Airport surface data for this period (EPA had filled in missing data) are readily available from EPA's Support Center for Regulatory Atmospheric Modeling (SCRAM) (EPA, 2008h) web site~~.

Pocatello Airport is located 77 kilometers (48 miles) south of the EREF and both sites are characterized by predominantly rural surroundings with no significant nearby terrain influences. Therefore, the surface data collected at Pocatello Airport was adequately representative to conduct the modeling analysis to evaluate maximum impacts at the EREF site. For the upper air data, Boise Airport was the closest available data and therefore was used in this analysis.

Sixty-two (62) property line receptors were selected for the refined modeling analysis to determine the maximum air quality impacts caused by construction site preparation activity.

In order to demonstrate that the construction site preparation activities comply with the applicable National Ambient Air Quality Standards (NAAQS) (CFR, 2008nn), maximum predicted air quality impacts for each pollutant must be added to representative background air quality concentrations that represent the contribution from all un-modeled emissions sources. Background concentrations must be obtained for each pollutant and each averaging period for which an NAAQS exists. Insert B

Insert C

There is a network of air pollutant monitoring sites throughout the State of Idaho. The nearest monitoring sites to the EREF are located in Pocatello, Idaho, where multiple monitoring sites are in operation for most of the criteria pollutants. Because of the general proximity of the Pocatello monitors to the EREF site, the air quality data at these sites will be assumed to be representative of air quality at the EREF site. For criteria pollutants not monitored in Pocatello, the next closest monitoring location was selected. In order to determine background concentrations for the modeling analysis, monitoring data reports for the most recent two years (2006 and 2007) were obtained from EPA's AIRData web-site (EPA, 2008i).

Table 4.6-2, Background Air Quality Concentrations for AERMOD Modeling Analysis, summarizes the monitored concentration data that were used in the background analysis and presents the calculated background concentrations that were used in the AERMOD modeling analysis. Because the NAAQS typically allow for a single exceedance of a short-term (24-hour average or less) standard without causing a violation, the short-term background concentrations for carbon monoxide (CO) and sulfur dioxide (SO_2) are based on the second-highest concentration measured at each monitor during each year. The higher of the two second-highest values was selected as the background concentration. In addition, based on modeling guidelines, the 24-hour average background concentrations for PM_{10} are based on the third highest concentration measured over the two-year period and $PM_{2.5}$ are based on the 98th percentile monitored concentration (i.e., 98 percent of the monitored concentrations are less than that value).

Insert A

The modeling analysis was performed using the most recent five years (2003-2007) of hourly surface meteorological data from the EBR station on the INL site (determined to be representative of the EREF site) and from the National Weather Service (NWS) station at Pocatello Municipal Airport in Pocatello, Idaho along with concurrent upper air sounding data collected at the Boise International Airport in Boise, Idaho. The three sets of data (two surface and one upper air) were input into AERMOD's general purpose meteorological preprocessor AERMET, which organizes and processes meteorological data and estimates the boundary layer parameters necessary for dispersion calculations. AERMET processed the meteorological data by utilizing the Pocatello data only when the EBR station data was not available.

Insert B

Two air dispersion modeling efforts were conducted to assess the potential air impacts during construction. The first effort modeled potential impacts to the closest downwind property boundary. The second effort modeled potential impacts at U.S. Highway 20, which is the major roadway to the south of the proposed site. Potential impacts at U.S. Highway 20 were assessed because U.S. Highway 20 is the closest area where the general public would have reasonable access to the site location, and therefore, is where greatest potential for exposure to emissions during construction exists.

Insert C

Fifty potential receptor locations were modeled along U.S. Highway 20 at intervals approximately 100 meters apart.

Tables 4.6-3a and 4.6-3b,

The results of the air quality impact analysis of the EREF construction site preparation activities are presented in ~~Table 4.6-3~~, Results of Air Quality Impact AERMOD Dispersion Modeling for EREF Construction Site Preparation Activity. All predicted concentrations shown in Table 4.6-3, Results of Air Quality Impact AERMOD Dispersion Modeling for EREF Construction Site Preparation Activity, include the appropriate ambient background level noted in Table 4.6-2, Background Air Quality Concentrations for AERMOD Modeling Analysis. No NAAQS has been set for hydrocarbons; however, the total annual emissions of hydrocarbons predicted from the site (approximately 4,045 kg (4.5 tons)) are well below the level of 36,287 kg (40 tons) that defines a significant source of volatile organic compounds (40 CFR 52.21(b)(23)(i)) (CFR, 2008qq).

a | 2.2

As shown in Table 4.6-3, Results of Air Quality Impact AERMOD Dispersion Modeling for EREF Construction Site Preparation Activity, the maximum predicted one-hour and eight-hour CO concentrations for the EREF construction site preparation were 4.6 ppm and ~~2.1~~ ppm, respectively. All CO concentrations were generated by vehicle exhaust from support vehicles and construction equipment utilized on-site. None of the modeled CO concentrations exceed the NAAQS noted in Table 4.6-3, Results of Air Quality Impact AERMOD Dispersion Modeling for EREF Construction Site Preparation Activity.

Property Line Receptor Locations | 11.9

The maximum predicted annual nitrogen dioxide (NO_2) concentration was estimated to be ~~11.6~~ µg/m^3. As with CO concentrations, all NO_2 concentrations were generated from vehicle exhaust and do not exceed the NAAQS.

63.8

For SO_2 concentrations, the estimated maximum annual concentration was 15.7 µg/m^3, ~~63.4~~ µg/m^3 for the 24-hour averaging period, and ~~163.1~~ µg/m^3 for the 3-hour averaging period. SO_2 concentrations were generated by vehicle exhaust from construction equipment. None of the predicted SO_2 concentrations exceeded the NAAQS.

165.7 | Property Line Receptor Locations | 27.3 | a

PM_{10} concentrations were mainly generated by fugitive dust caused by construction activity. To a lesser extent, vehicle exhaust from construction equipment contributed to the PM_{10} concentrations. As can be seen in Table 4.6-3, Results of Air Quality Impact AERMOD Dispersion Modeling for EREF Construction Site Preparation Activity, the maximum predicted annual PM_{10} concentration was ~~25.8~~ µg/m^3 while the 24-hour PM_{10} concentration was estimated to be 150 µg/m^3. The NAAQS for the annual averaging period was revoked in 2006 and therefore does not apply. The 24-hour PM_{10} concentration is at the NAAQS but does not exceed the limit noted in Table 4.6-3, Results of Air Quality Impact AERMOD Dispersion Modeling for EREF Construction Site Preparation Activity. This maximum 24-hour PM_{10} concentration is predicted to occur at a location on the property boundary that is closest to the southwest portion of the area of disturbance.

at the property boundary

Predicted maximum $PM_{2.5}$ annual concentrations were estimated to be ~~7.1~~ µg/m^3 and the 24-hour concentration was ~~30~~ µg/m^3. These concentrations do not exceed the annual and 24-hour NAAQS shown in Table 4.6-3, Results of Air Quality Impact AERMOD Dispersion Modeling for EREF Construction Site Preparation Activity. Fugitive dust generated by construction activity and vehicle exhaust is a contributor to the $PM_{2.5}$ concentrations.

28.0 | 7.0

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 the EREF will 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 the standby diesel generators. Construction emission types, source locations, and emission quantities are presented in Table 4.6-4, Construction Emission Types.

Insert D

Insert D

As shown in Table 4.6-3b, Results of Air Quality Impact AERMOD Dispersion Modeling for EREF Construction Site Preparation Activity U.S. Highway 20 Receptor Locations, the maximum predicted one-hour and eight-hour CO concentrations for the EREF construction site preparation at U.S. Highway 20 locations were 4.4 and 2.1 ppm, respectively. The predicted CO concentrations do not exceed the NAAQS noted in Table 4.6-3b.

The maximum predicted annual NO_2 concentration at U.S. Highway 20 locations was estimated to be 11.3 ug/m^3, below the standard shown in Table 4.6-3b.

For SO_2 concentrations at U.S. Highway 20 locations, the estimated maximum annual concentration was 15.7 ug/m^3. The 24-hour average was 63.3 ug/m^3. The 3-hour average was 162.3 ug/m^3. All predicted SO_2 concentrations were below the standards shown in Table 4.6-3b.

The maximum predicted annual PM_{10} concentration at U.S. Highway 20 locations was 23.2 ug/m^3. The 24-hour average PM_{10} concentration was 113.5 ug/m^3. Neither concentration exceeded the standards shown in Table 4.6-3b. The maximum predicted annual $PM_{2.5}$ concentration at U.S. Highway 20 locations was 6.6 ug/m^3. The 24-hour average $PM_{2.5}$ concentration was 24.3 ug/m^3. The predicted PM_{10} and $PM_{2.5}$ concentrations do not exceed the standards shown in Table 4.6-3b.

Table 4.6-1 Peak Emission Rates
(Page 1 of 1)

Pollutant	Total Work-Day Average Emissions g/s (lbs/hr)
Vehicle Emissions:	
Hydrocarbons	0.34 (2.67)
Carbon Monoxide	3.55 (28.19)
Nitrogen Oxides	1.30 (10.29)
Sulfur Oxides	0.10 (0.77)
Particulates[1]	0.02 (0.17)
Fugitive Emissions: U.S. Highway 20 Receptor Locations	
PM_{10}	~~21.8 (172.7)~~ 31.8 g/s (252.4 lb/hr)
$PM_{2.5}$	~~3.3 (25.9)~~ 3.2 g/s (25.2 lb/hr)

Note:

[1]Conservatively assumed all vehicle particulate emissions were $PM_{2.5}$, which means $PM_{2.5}$=PM_{10}.

Fugitive Emissions: Property Line Receptor Locations	
PM_{10}	13.7 g/s (108.9 lb/hr)
$PM_{2.5}$	1.4 g/s (10.9 lb/hr)

Table 4.6-3 Results of Air Quality Impact AERMOD Dispersion Modeling for EREF Construction Site Preparation Activity

(Page 1 of 1)

Pollutant	Averaging Period	Standard	Modeled Maximum Concentration[1]	Units	Exceedance?
Carbon Monoxide (CO)	8 Hour	9 ppm	2.1	ppm	No
	1 Hour	35 ppm	4.6	ppm	No
Nitrogen Dioxide (NO_2)	Annual	100 $\mu g/m^3$	11.6	ug/m^3	No
Sulfur Dioxide (SO_2)	Annual	80 $\mu g/m^3$	15.7	ug/m^3	No
	24 Hour	365 $\mu g/m^3$	63.4	ug/m^3	No
	3 Hour	1300 $\mu g/m^3$	163.1	ug/m^3	No
Particulate Matter PM_{10}	Annual	Revoked in 2006	25.8	ug/m^3	Not Applicable
	24 Hour	150 $\mu g/m^3$	150.0	ug/m^3	No
Particulate Matter $PM_{2.5}$	Annual	15 $\mu g/m^3$	7.1	ug/m^3	No
	24 Hour	35 $\mu g/m^3$	30.0	ug/m^3	No

Note:

[1]Modeled Maximum Concentrations include an ambient background concentration (see Table 4.6-2).

Replace with 4.6-3a and 4.6-3b attached.

4.6-3a

Table ~~B-4a~~ Results of Air Quality Impact AERMOD Dispersion Modeling for EREF Construction Site Preparation Activity Property Line Receptor Locations

Pollutant	Averaging Period	Standard	Modeled Maximum Concentration	Units	Exceedance?
Carbon Monoxide (CO)	8-Hour	9 ppm	2.2	ppm	NO
	1-Hour	35 ppm	4.6	ppm	NO
Nitrogen Dioxide (NO_2)	Annual	100 μg/m^3	11.9	ug/m^3	NO
Sulfur Dioxide (SO_2)	Annual	80 μg/m^3	15.7	ug/m^3	NO
	24-Hour	365 μg/m^3	63.8	ug/m^3	NO
	3-Hour	1300 μg/m^3	165.7	ug/m^3	NO
Particulate Matter - PM_{10}	Annual	Revoked 2006	27.3	ug/m^3	NA
	24-Hour	150 μg/m^3	150.0	ug/m^3	NO
Particulate Matter - $PM_{2.5}$	Annual	15 μg/m^3	7.0	ug/m^3	NO
	24-Hour	35 μg/m^3	28.0	ug/m^3	NO

Note:
All Modeled Maximum Concentrations include an ambient background concentration.
NA means not applicable.

4.6-3b

Table ~~B-4b~~ Results of Air Quality Impact AERMOD Dispersion Modeling for EREF Construction Site Preparation Activity U.S. Highway 20 Receptor Locations

Pollutant	Averaging Period	Standard	Modeled Maximum Concentration	Units	Exceedance?
Carbon Monoxide (CO)	8-Hour	9 ppm	2.1	ppm	NO
	1-Hour	35 ppm	4.4	ppm	NO
Nitrogen Dioxide (NO_2)	Annual	100 μg/m^3	11.3	ug/m^3	NO
Sulfur Dioxide (SO_2)	Annual	80 μg/m^3	15.7	ug/m^3	NO
	24-Hour	365 μg/m^3	63.3	ug/m^3	NO
	3-Hour	1300 μg/m^3	162.3	ug/m^3	NO
Particulate Matter - PM_{10}	Annual	Revoked 2006	23.2	ug/m^3	NA
	24-Hour	150 μg/m^3	113.5	ug/m^3	NO
Particulate Matter - $PM_{2.5}$	Annual	15 μg/m^3	6.6	ug/m^3	NO
	24-Hour	35 μg/m^3	24.3	ug/m^3	NO

Note: All Modeled Maximum Concentrations include an ambient background concentration.
NA means not applicable.

U.S. Highway 20 Receptor Locations

Table 4.6-4 Construction Emission Types
(Page 1 of 1)

31.8 g/s (252.4 lb/hr)
3.2 g/s (25.2 lb/hr)

Emission Type	Source Location	Quantity
Fugitive Dust PM$_{10}$ PM$_{2.5}$	Onsite	~~21.8 g/s (172.7 lb/hr)~~ ~~3.3 g/s (25.9 lb/hr)~~
Vehicle Exhaust	Onsite	4,045 kg/yr (4.5 tons/yr)
Paint Fumes	Onsite buildings	NA[1]
Welding Torch Fumes	Onsite buildings	NA[1]
Solvent Fumes	Onsite buildings	NA[1]
Air Compressors	NA[1]	NA[1]
Portable Generators	NA[1]	NA[1]
Standby Diesel Generator Exhaust[2]	Electrical Services Building	61 kg/yr (0.067 ton/yr) of PM$_{10}$ 8,437 kg/yr (9.3 ton/yr) of NO$_x$ 726 kg/yr (0.80 ton/yr) of CO 168 kg/yr (0.185 ton/yr) of VOC

Notes:

[1]Information is not available at this time.

[2]This emission category includes emissions from four (4) 2,500 kW standby diesel generators and two (2) smaller diesel generators (security diesel generator and fire pump diesel). For the purpose of calculating aggregate emissions from this emission category, it was conservatively assumed that all six generators each had a capacity of 2,500 kW and that each generator was tested for 1.6 hours per week for 52 weeks per year.

Fugitive Dust Property Line Receptor Locations PM$_{10}$ PM$_{2.5}$	Onsite	13.7 g/s (108.9 lb/hr) 1.4 g/s (10.9 lb/hr)

U.S Highway 20 Receptor Locations

Table 4.6-15 Decommissioning Emission Types
(Page 1 of 1)

Emission Type[1]	Source Location	Quantity
Fugitive Dust (U.S Highway 20 Receptor Locations) PM_{10} $PM_{2.5}$	Onsite	31.8 g/s (252.4 lb/hr) 3.2 g/s (25.2 lb/hr) ~~21.8 g/s (172.7 lb/hr)~~ ~~3.3 g/s (25.9 lb/hr)~~
Vehicle Exhaust	Onsite	4,045 kg/yr (4.5 tons/yr)
Portable Generator Exhaust	Onsite buildings	NA[2]
Cutting Torch Fumes	Onsite buildings	NA[2]
Solvent Fumes	NA[2]	NA[2]
Standby Diesel Generator Exhaust[3]	Electrical Services Building	61 kg/yr (0.067 ton/yr) of PM_{10} 8,437 kg/yr (9.3 ton/yr) of NO_x 726 kg/yr (0.80ton/yr) of CO 168 kg/yr (0.185ton/yr) of VOC
Air Compressors	Onsite buildings	NA[2]

Notes:

[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.

[3]This emission category includes emissions from four (4) 2,500 kW standby diesel generators and two (2) smaller diesel generators (security diesel generator and fire pump diesel). For the purpose of calculating aggregate emissions from this emission category, it was conservatively assumed that all six generators each had a capacity of 2,500 kW and that each generator was tested for 1.6 hours per week for 52 weeks per year.

Fugitive Dust Property Line Receptors PM_{10} $PM_{2.5}$	Onsite	13.7 g/s (108.9 lb/hr) 1.4 g/s (10.9 lb/hr)

LIST OF TABLES

ER RAI #3

1.0 INTRODUCTION

Refined dispersion modeling was performed in order to demonstrate that air quality impacts from construction site preparation activities at the proposed Eagle Rock Enrichment Facility (EREF) will not cause exceedances of any National Ambient Air Quality Standards (NAAQS) (CFR, 2008a). The dispersion modeling analysis includes combustion sources, such as support vehicles and construction equipment and fugitive dust generated by activity on unpaved surfaces onsite. This report describes the specific dispersion modeling methods and procedures used in this analysis, which is consistent with the Environmental Protection Agency (EPA) Guideline on Air Quality Models (40 CFR Part 51, Appendix W (CFR, 2008b) and with other modeling guidance. Air quality impacts from the construction activity were determined for the following criteria air pollutants: carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2) and particulate matter (PM_{10} and $PM_{2.5}$). There are no NAAQS for hydrocarbon emissions. As such, hydrocarbon emissions are not included in this Appendix B. Hydrocarbon emissions are discussed in Section 4.6, Air Quality Impacts.

2.0 SITE DESCRIPTION

The proposed EREF is located along Route 20 approximately 300 km (186 mi) east of Boise, Idaho. The topography of the site is primarily flat in relation to the property line receptors and the construction site preparation area. Even though the terrain is unlikely to have a significant effect on plume transport and dispersion, terrain elevations were included in the modeling analysis.

3.0 MODELING METHODOLOGY

3.1 SELECTION OF DISPERSION MODEL

For this modeling analysis, the latest version of the EPA's AERMOD modeling system (version 07026) (EPA, 2008a) was used. AERMOD is a refined, steady-state, multi-source, Gaussian dispersion model that is EPA's preferred model for a wide range of regulatory applications in all types of terrain.

The AERMOD modeling system also includes the following major components:

- AERMET – The AERMOD system's general purpose meteorological preprocessor that organizes and processes meteorological data and estimates the boundary layer parameters necessary for dispersion calculations.
- AERMAP – The AERMOD system's terrain preprocessor module that processes digitized terrain elevation data files to produce terrain base elevations and hill height scale values for each receptor.
- AERSURFACE – A recently developed tool to aid in obtaining realistic and reproducible surface characteristic values for albedo, Bowen ratio, and surface roughness length for AERMET.

the most recent

All modeling was performed using AERMOD's regulatory default option.

3.2 METEOROLOGICAL DATA AND SURFACE CHARACTERISTICS

2003-2007

The AERMOD modeling analysis was performed using five years (~~1988-1992~~) of hourly surface meteorological data from the National Weather Service (NWS) station at Pocatello Municipal Airport in Pocatello, Idaho and concurrent upper air sounding data collected at the Boise

the National Oceanic and Atmospheric Administration (NOAA) Idaho National Laboratory (INL) Materials & Fuels Complex site (formerly known as the EBR) and from

Insert A

International Airport in Boise, Idaho. The Pocatello Airport surface data for this period are readily available from EPA's Support Center for Regulatory Atmospheric Modeling (SCRAM) website (EPA, 2008b).

Pocatello Airport is located 77 km (48 mi) south of the EREF and both sites are characterized by predominantly rural surroundings with no significant nearby terrain influences. Therefore, the surface data collected at Pocatello Airport was adequately representative to conduct the modeling analysis to evaluate maximum impacts at the EREF site. For the upper air data, Boise Airport was the closest available data and therefore was used in this analysis.

AERMOD requires more detailed meteorological information than predecessor regulatory air quality models. In addition to surface meteorological and upper air sounding data, the AERMET preprocessor also requires values of surface characteristics, including albedo, Bowen ratio, and surface roughness length, that are representative of conditions in the vicinity of the meteorological tower. To aid modelers in obtaining realistic and reproducible surface characteristic values, the AERSURFACE tool was developed by EPA. AERSURFACE requires the input of land cover data from the U.S. Geological Survey (USGS) National Land Cover Data 1992 (NLCD92) archives (USGS, 2008a) in order to identify the land cover for a specific location. Values of surface characteristics are then calculated based on the land cover data for the study area.

An AERSURFACE analysis was performed for the ~~Pocatello Airport~~ INL site location. Seasonal surface characteristics were determined for each of twelve 30-degree sectors. Seasonal categories were assigned as follows, using AERSURFACE's default setting:

- "Midsummer" – June, July, August
- "Autumn" – September, October, November
- "Late Autumn/Winter without continuous snow on ground" – December, January, February
- "Transitional spring" – March, April, May.

Insert B

~~The site was also identified as an airport site so that the calculated surface characteristics reflect an area more dominated by transportation land cover. In addition, the airport site was noted to be in an arid region and the modeled five years of meteorological data as having a site surface moisture drier than other years when compared to the last 30 years.~~ As recommended in EPA's AERMOD Implementation Guide (revised January 9, 2008) (EPA, 2008c), an upwind distance of 1 km (0.62 mi) was used to determine the effective surface roughness values for input to AERMET. A domain of 10 km (6.2 mi) by 10 km (6.2 mi) was used for the determination of albedo and Bowen ratio.

3.3 LAND USE CLASSIFICATION

AERMOD contains algorithms for evaluating dispersion for source locations in both urban and rural areas. Based on the land use classification procedure described in the AERMOD modeling guidelines and on a review of topographic maps and aerial photographs, the land use in the area within 3 km (1.9 mi) of the EREF is predominantly rural. Therefore, AERMOD was run using the rural dispersion option.

3.4 EMISSION SOURCE DATA

The refined AERMOD dispersion modeling analysis for the construction site preparation activities included vehicle exhaust and fugitive dust generation. Fugitive dust is caused by vehicle traffic on unpaved surfaces, earth moving, excavating and bulldozing and to a lesser

Fugitive Dust

Fugitive dust emissions are dependent on the area of land being worked on and also the level of construction vehicle operations occurring at any given time. A fugitive dust emission factor of 2.69 Mg per hectare (1.2 tons per acre) per month of construction activity is provided in AP-42 (EPA, 2008d) for heavy construction operation activities. This factor includes all site-related sources of particulates. The value is most applicable to construction sites with: (1) medium activity level, (2) moderate silt content and (3) a semi-arid climate.

Insert C

The ~~AP-42~~ emission factor applies to total suspended particulates (TSP), whereas the NAAQS for particulates ~~applies~~ to PM_{10} (i.e., particles 10 µm or less in size) and $PM_{2.5}$ (i.e., particles 2.5 µm or less in size). ~~Based on particle size multipliers presented in AP-42 for fugitive dust sources, a correction factor of 0.5 was applied to the TSP construction emission factor in order to determine the PM_{10} emission factor. Similarly, AP-42 provides an adjustment factor to determine the amount of $PM_{2.5}$ present in the fugitive dust. Based on AP-42, a correction factor of 0.15 was applied to the PM_{10} emission factor to make the adjustment to $PM_{2.5}$. Therefore, a correction factor of 0.08 (i.e., 0.5 x 0.15 = 0.08) was applied to the TSP construction emission factor to obtain $PM_{2.5}$.~~

Since the derivation of the AP-42 emission factor assumed construction activity on 30 days per month, a second correction factor to account for actual number of workdays was applied. The average number of workdays per month will be 21.4 (4 major holidays were excluded). The second correction factor that was used is 21.4/30 or 0.71.

The AP-42 emission factor also assumes uncontrolled emissions, whereas the EREF construction site will undergo watering for dust suppression. Water conservation will be considered when deciding how often dust suppression sprays will be applied. The EPA suggests that a twice-daily watering program will reduce dust emissions by up to 90%. Therefore, a third correction factor of 0.1 was applied to the AP-42 emission factor to account for fugitive dust controls.

Insert D

An additional factor to account for the high silt content of the site soil was also included since AP-42 considers moderate silt content in the emission factor value. Since the site soil silt content is estimated to be approximately ~~70~~% and the fact that moderate silt content used in the AP-42 emission factor is defined to be about 30%, a silt content correction factor was established by taking the ratio of the "high to moderate" silt content. Therefore, a correction factor for silt content that was used is ~~70~~% / 30% = ~~2.3.~~

The workday emission rate (in g/s) was calculated assuming approximately ~~75~~ hectares (~~185~~ acres) of the construction site would be under construction at any given time and that emissions occur entirely within the 10-hour workday. This workday emission rate was assumed to occur 214 hours per month (i.e., 21.4 average work days/month x 10-hour work day) for the entire year.

The resulting estimate of workday emission rate for PM_{10} was determined to be ~~21.8~~ g/s (~~172.7~~ lb/hr) and ~~3.3~~ g/s (~~25.9~~ lb/hr) for $PM_{2.5}$ emissions.

For the property line receptor locations, t

Insert E

3.5 RECEPTORS

Sixty-two property line receptors were selected for the refined modeling analysis to determine the maximum air quality impacts caused by construction site preparation activity.

The AERMAP terrain preprocessor was used to define the receptor terrain elevations based on USGS Digital Elevation Model (DEM) data (USGS, 2008b). The DEM data consist of arrays of regularly spaced elevations and correspond to the 7.5-minute (1:24,000 scale) topographic quadrangle map series. The points in the elevation data arrays are spaced at approximately 30-m (98-ft) intervals and were interpolated by AERMAP to determine the elevation at each defined receptor. AERMAP also computes the hill height scale associated with each receptor to estimate the influence of complex terrain. The AERMAP processing domain was selected to cover all property line receptors and included any important terrain features located onsite.

3.6 BACKGROUND AIR QUALITY CONCENTRATIONS

In order to demonstrate that the construction site preparation activities comply with the applicable NAAQS concentration levels, maximum predicted air quality impacts for each pollutant must be added to representative background air quality concentrations that represent the contribution from all un-modeled emissions sources. Background concentrations must be obtained for each pollutant and each averaging period for which an NAAQS exists.

There is a network of air pollutant monitoring sites throughout the State of Idaho. The nearest monitoring sites to the EREF are located in Pocatello, Idaho, where multiple monitoring sites are in operation for most of the criteria pollutants. Because of the general proximity of the Pocatello monitors to the EREF site, the air quality data at these sites will be assumed to be representative of air quality at the EREF site. For criteria pollutants not monitored in Pocatello, the next closest monitoring location was selected. In order to determine background concentrations for the modeling analysis, monitoring data reports for the most recent two years (2006 and 2007) were obtained from EPA's AirData website (EPA, 2008).

Table B-3, Background Air Quality Concentrations for AERMOD Modeling Analysis, summarizes the monitored concentration data that were used in the background analysis and presents the calculated background concentrations that were used in the AERMOD modeling analysis. Because the NAAQS typically allow for a single exceedance of a short-term (24-hour average or less) standard without causing a violation, the short-term background concentrations for CO and SO_2 are based on the second-highest concentration measured at each monitor during each year. The higher of the two second-highest values was selected as the background concentration. In addition, based on modeling guidelines, the 24-hour average background concentrations for PM_{10} are based on the 3rd highest concentration measured over the two-year period and $PM_{2.5}$ are based on the 98th percentile monitored concentration (i.e., 98 percent of the monitored concentrations are less than that value).

4.0 MODELING RESULTS AND CONCLUSIONS

The results of the air quality impact AERMOD dispersion modeling analysis for the EREF construction site preparation activities are presented in Table B-4, Results of Air Quality Impact AERMOD Dispersion Modeling for EREF Construction Site Preparation Activity. All predicted concentrations shown in Table B-4 include an ambient background level noted in Table B-3.

As shown in Table B-4, the maximum predicted one- and eight-hour CO concentrations for the EREF construction site preparation were 4.6 ppm and 2.1 ppm, respectively. All CO concentrations were generated by vehicle exhaust from support vehicles and construction equipment utilized onsite. None of the modeled CO concentrations exceed the NAAQS noted in Table B-4.

The maximum predicted annual NO_2 concentration was estimated to be 11.6 μg/m^3. As with CO concentrations, all NO_2 concentrations were generated from vehicle exhaust and do not exceed the NAAQS.

For SO_2 concentrations, the estimated maximum annual concentration was 15.7 μg/m^3, 63.4 μg/m^3 for the 24-hour averaging period and 163.1 μg/m^3 for the 3-hour averaging period. SO_2 concentrations were generated by vehicle exhaust from construction equipment. None of the predicted SO_2 concentrations exceeded the NAAQS.

PM_{10} concentrations were mainly generated by fugitive dust caused by construction activity. To a lesser extent, vehicle exhaust from construction equipment contributed to the PM_{10} concentrations. As can be seen in Table B-4, the maximum predicted annual PM_{10} concentration was 25.8 μg/m^3 while the 24-hour PM_{10} concentration was estimated to be 150 μg/m^3. The 24-hour PM_{10} concentration is at the NAAQS but does not exceed the limit noted in Table B-4. The NAAQS for the annual averaging period was revoked in 2006 and therefore does not apply.

Similarly, predicted maximum $PM_{2.5}$ annual concentrations were estimated to be 7.1 μg/m^3 and the 24-hour concentration was 30 μg/m^3. These concentrations do not exceed the annual and 24-hour NAAQS shown in Table B-4. Fugitive dust generated by construction activity and vehicle exhaust are both contributors to the $PM_{2.5}$ concentrations.

5.0 REFERENCES

CFR, 2008a. Title 40, Code of Federal Regulations Part 50, National primary and secondary ambient air quality standards, 2008.

CFR, 2008b. Title 40 Code of Federal Regulations Part 51, Appendix W, Guideline of Air Quality Models, 2008.

EPA, 2003. User's Guide for MOBILE6.1 and MOBILE6.2 Mobile Source Emission Factor Model, EPA420-R-03-010, August 2003.

EPA, 2008a. AERMOD Modeling System, U.S. Environmental Protection Agency, Website: http://www.epa.gov/scram001/dispersion_prefrec.htm#aermod, Date accessed: August 2008.

EPA, 2008b. Surface and Upper Air Meteorological Databases, Support Center for Regulatory Atmospheric Modeling (SCRAM), U.S. Environmental Protection Agency, Website: http://www.epa.gov/scram001/metobsdata_databases.htm, Date accessed: August 2008.

EPA, 2008c. AERMOD Implementation Guide, U.S. Environmental Protection Agency, January 9, 2008.

EPA, 2008d. Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition (with Supplements), U.S. Environmental Protection Agency, Website: www.epa.gov/ttn/chief, Date accessed: August 2008.

EPA, 2008e. AirData, Monitor Values Report, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Website: www. epa.gov/air/data, Date accessed August 2008.

USGS, 2008a. Land Cover Data 1992 (NLCD92), U.S. Geological Survey, Website: http://edcftp.cr.usgs.gov/pub/data/landcover/states, Date accessed: August 2008.

USGS, 2008b. U.S. Geological Survey Digital Elevation Model (DEM) Data obtained from WEBGIS, Website: http://www.webgis.com/terr_pages/terr_dem75_id.html, Date accessed: August 2008.

add attached references

Add these references

University of Idaho, 1977: "Hydraulic Conductivity and Moisture Retention Characteristics of Southern Idaho's Silt Loam Soils", Robbins, January 1997

NOAA, 2008, MFC/EBR and KET Hourly Meteorological Data 2003-2007

Table B-4 Results of Air Quality Impact AERMOD Dispersion Modeling for EREF Construction Site Preparation Activity (Page 1 of 1)

Pollutant	Averaging Period	Standard	Modeled Maximum Concentration	Units	Exceedance
Carbon Monoxide (CO)	8-Hour	9 ppm	2.1	ppm	No
	1-Hour	35 ppm	4.6	ppm	No
Nitrogen Dioxide (NO_2)	Annual	100 µg/m^3	11.6	ug/m^3	No
Sulfur Dioxide (SO_2)	Annual	80 µg/m^3	15.7	ug/m^3	No
	24-Hour	365 µg/m^3	63.4	ug/m^3	No
	3-Hour	1300 µg/m^3	163.1	ug/m^3	No
Particulate Matter -PM_{10}	Annual	Revoked 2006	25.8	ug/m^3	Not Applicable
	24-Hour	150 µg/m^3	150.0	ug/m^3	No
Particulate Matter - $PM_{2.5}$	Annual	15 µg/m^3	7.1	ug/m^3	No
	24-Hour	35 µg/m^3	30.0	ug/m^3	No

Note: All Modeled Maximum Concentrations include an ambient background concentration (see Table B-3).

replace with attached Tables B-4a and B-4b

Table B-4a Results of Air Quality Impact AERMOD Dispersion Modeling for EREF Construction Site Preparation Activity Property Line Receptor Locations

Pollutant	Averaging Period	Standard	Modeled Maximum Concentration	Units	Exceedance?
Carbon Monoxide (CO)	8-Hour	9 ppm	2.2	ppm	NO
	1-Hour	35 ppm	4.6	ppm	NO
Nitrogen Dioxide (NO_2)	Annual	100 μg/m^3	11.9	ug/m^3	NO
Sulfur Dioxide (SO_2)	Annual	80 μg/m^3	15.7	ug/m^3	NO
	24-Hour	365 μg/m^3	63.8	ug/m^3	NO
	3-Hour	1300 μg/m^3	165.7	ug/m^3	NO
Particulate Matter - PM_{10}	Annual	Revoked 2006	27.3	ug/m^3	NA
	24-Hour	150 μg/m^3	150.0	ug/m^3	NO
Particulate Matter - $PM_{2.5}$	Annual	15 μg/m^3	7.0	ug/m^3	NO
	24-Hour	35 μg/m^3	28.0	ug/m^3	NO

Note:
All Modeled Maximum Concentrations include an ambient background concentration.
NA means not applicable.

Table B-4b Results of Air Quality Impact AERMOD Dispersion Modeling for EREF Construction Site Preparation Activity U.S. Highway 20 Receptor Locations

Pollutant	Averaging Period	Standard	Modeled Maximum Concentration	Units	Exceedance?
Carbon Monoxide (CO)	8-Hour	9 ppm	2.1	ppm	NO
	1-Hour	35 ppm	4.4	ppm	NO
Nitrogen Dioxide (NO_2)	Annual	100 μg/m^3	11.3	ug/m^3	NO
Sulfur Dioxide (SO_2)	Annual	80 μg/m^3	15.7	ug/m^3	NO
	24-Hour	365 μg/m^3	63.3	ug/m^3	NO
	3-Hour	1300 μg/m^3	162.3	ug/m^3	NO
Particulate Matter - PM_{10}	Annual	Revoked 2006	23.2	ug/m^3	NA
	24-Hour	150 μg/m^3	113.5	ug/m^3	NO
Particulate Matter - $PM_{2.5}$	Annual	15 μg/m^3	6.6	ug/m^3	NO
	24-Hour	35 μg/m^3	24.3	ug/m^3	NO

Note: All Modeled Maximum Concentrations include an ambient background concentration.
NA means not applicable.

Insert A

The INL site was determined to be representative of the climate at the EREF site. Pocatello surface data was only utilized when the INL site data was not available. Note the wind speed and wind direction data, which is most critical to the estimated pollutant concentrations, was obtained from the INL site and was used in the dispersion modeling analysis.

The INL site is approximately 16 kilometers (10 miles) west of the EREF site. The area immediately surrounding the INL and EREF sites is nearly flat with vegetation consisting of grasses and low sagebrush. Southeast Idaho temperatures, cloud cover and surface winds are influenced by the subtle topography and higher elevation along the southern perimeter of the INL and EREF sites.

Insert B

The INL site was noted to be in an arid region and the modeled five years of meteorological data as having average site surface moisture compared to other areas surrounding the site.

Insert C

The construction activity emission factor, (obtained from AP-42 Chapter 13.2.3, Heavy Construction Equipment and used in the dispersion modeling analysis), was updated to adjust for the ratio of Total Suspended Particulate (TSP) to PM_{10} and $PM_{2.5}$. The correction factor for PM_{10} and $PM_{2.5}$ as a ratio of TSP were based on the empirical constant k, contained in AP-42 Chapter 13.2.2 - Introduction to Fugitive Dust Sources – Unpaved Roads. The ratios between constants for TSP, $PM_{10,}$ and $PM_{2.5}$ were used to determine the amount of TSP that is PM_{10} and $PM_{2.5}$ respectively. Based on the ratio of PM_{10} and TSP k constants, a correction factor of 0.31 (i.e., 1.5 / 4.9 = 0.31) was applied to the TSP construction emission factor in order to determine the PM_{10} emission factor. Similarly, the ratio of $PM_{2.5}$ and TSP k constants was used to calculate the correction factor of 0.03 (i.e., 0.15 / 4.9 = 0.03) to make the adjustment to $PM_{2.5}$.

Insert D

To quantitatively assess the amount of water that could be needed for dust suppression, the maximum amount of watering required to achieve the 90% goal, based on obtaining the 4.5 moisture ratio shown in Figure 13.2.2-2, was estimated using a spreadsheet developed by the EPA. The spreadsheet calculates moisture content of a road surface over time. Inputs into the spreadsheet include monthly Class A pan evaporation values, hourly meteorological data for precipitation and humidity, vehicle information and road surface material information. Meteorological data from the EBR station was used in the spreadsheet. Vehicle information was based on support vehicle and construction equipment data discussed above. All other inputs were obtained from tables presented in AP-42 Chapter 13.2.2.

In order to determine the worst case watering requirement for the construction project site, the driest month (July) was selected based on the EBR station meteorological data inputs. The calculated uncontrolled road surface moisture content was multiplied by 4.5 to determine what road surface moisture content would be needed to achieve the 90% dust control goal. The spreadsheet was adjusted to calculate the amount of precipitation that would be needed to obtain the desired moisture content. The amount of precipitation was converted to the amount of water that needs to be applied using an equivalent of 5.6 gallons of water applied for every inch of precipitation. Based on this calculation, in order to achieve the 90% dust control goal for the worst case scenario, the project would be required to apply approximately 18,000 gallons per day onto unpaved roads where vehicles will be traveling. It was estimated that approximately 50 acres of the project site would be road surface, which equates to about 20 miles of roads traversing the site.

The watering needs for a typical construction day was calculated using the equations found in AP-42 Chapter 13.2.2 for calculating emissions from vehicles traveling on unpaved surfaces at industrial sites. The calculation was based on the road surface silt content, mean vehicle weight of support vehicles and construction equipment traveling on site, vehicle miles traveled and the number of days in a calendar year with at least 0.254 mm (0.01 in) of precipitation. Watering requirements were determined by estimating the number of precipitation days that would be needed to achieve the 90% dust control goal above the number of natural precipitation days (54 days) that occurred throughout the year. Based on this calculation, the project would be required to apply approximately 15,000 gallons of water on the typical construction day to achieve the 90% dust control goal.

Insert E

For the U.S Highway 20 receptor location assessment, the emission rate was calculated assuming 208 ha (515 acres) of the entire construction site would be under heavy construction at any given time and that emissions occur entirely within the 10-hour work day. This work day emission rate was assumed to occur 214 hours per month (i.e. 21.4 average work days/month x 10-hour work day) for the entire year.

For the U.S. Highway 20 receptor locations, the emission rate for PM_{10} was determined to be 31.8 g/s (252.4 lb/hr). The emission rate for $PM_{2.5}$ was determined to be 3.2 g/s (25.2 lb/hr).

Insert ~~X~~ F

As shown in Table B-4b, Results of Air Quality Impact AERMOD Dispersion Modeling for EREF Construction Site Preparation Activity U.S. Highway 20 Receptor Locations, the maximum predicted one-hour and eight-hour CO concentrations for the EREF construction site preparation at Route 20 locations were 4.4 and 2.1 ppm, respectively. The modeled CO concentrations did not exceed the NAAQS noted in Table B-4b.

The maximum predicted annual NO_2 concentration at U.S. Highway 20 locations was estimated to be 11.3 ug/m^3, below the standard shown in Table 4.6-3b.

For SO_2 concentrations at U.S. Highway 20 locations, the estimated maximum annual concentration was 15.7 ug/m^3. The 24-hour average was 63.3 ug/m^3. The 3-hour average was162.3 ug/m^3 All predicted SO_2 concentrations were below the standards shown in Table 4.6-3b.

The maximum predicted annual PM_{10} concentration at U.S. Highway 20 locations was 23.2 ug/m^3. The 24-hour average PM_{10} concentration was 113.5 ug/m^3. Neither concentration exceeded the standards shown in Table 4.6-3b. The maximum predicted annual $PM_{2.5}$ concentration at U.S. Highway locations was 6.6 ug/m^3. The 24-hour average $PM_{2.5}$ concentration was 24.3 ug/m^3. Neither predicted concentration exceeded the standards shown in Table 4.6-3b.