DOE/EA-2064

DRAFT A

ENVIRONMENTAL ASSESSMENT FOR THE ABOVE GROUND STORAGE CAPABILITY AT THE WASTE ISOLATION PILOT PLANT

U.S. DEPARTMENT OF ENERGY
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Acronyms and Abbreviations

AEC	Atomic Energy Commission
AGSC	Above Ground Storage Capacity
BGS	below ground surface
BLM	Bureau of Land Management
CB	Cabin Baby
CFR	Code of Federal Regulations
CH	contact-handled
cm	centimeter
DEA	Draft Environmental Assessment
DOE	U.S. Department of Energy
DSA	Documented Safety Analysis
EA	Environmental Assessment
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ERDA	Energy Research and Development Administration
FEIS	Final Environment Impact Statement
ft	foot
ft^2	square foot
ft^3	cubic foot
FY	fiscal year
GHG	greenhouse gas
HalfPACT	Half-package Transporter
HEPA	high efficiency air particulate
in.	inch
km	kilometer
L	liter
lbs/hr	pounds per hour
lbs/yr	pounds per year
LCF	latent cancer fatality
LMP	Land Management Plan
LWA	Land Withdrawal Act (Public Law 102-579)
m	meter
m^2	square meter
m^3	cubic meter
m/s	meter per second
mg/L	milligram per liter
MOI	maximally-exposed offsite individual
mrem	millirem

NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act
NMED	New Mexico Environment Department
NOA	Notice of Availability
NPH	natural phenomena hazards
NRC	Nuclear Regulatory Commission
Overpack Unit	Concrete Overpack Container Storage Unit
PAU	Parking Area Unit
Permit	Hazardous Waste Facility Permit
PPA	Property Protection Area
psi	pounds per square inch
PVS	Permanent Ventilation System
rem	roentgen equivalent man
RH	remote-handled
SHPO	State Historic Preservation Officer
SSW	shallow subsurface water
SVS	Supplemental Ventilation System
TDS	total dissolved solids
TRU	transuranic
TRUDOCK	TRUPACT-II Unloading Dock
TRUPACT-II	Transuranic Package Transporter Model II
U/G	underground
VHS	vent hood system
WHB	Waste Handling Building
WIPP	Waste Isolation Pilot Plant
WLWA	WIPP land withdrawal area

1. PURPOSE OF AND NEED FOR THE PROPOSED ACTION

1.1 Introduction

The Waste Isolation Pilot Plant (WIPP) is the nation's only approved repository for the disposal of defense related/defense generated transuranic (TRU) and mixed hazardous TRU waste (henceforth called TRU waste). The mission of the WIPP Project is to realize the safe disposal of TRU waste from TRU waste generator sites in the Department of Energy waste complex.

The WIPP Project was authorized by Title II, Section 213(a) of Public Law 96-164 (U. S. Congress 1979). Congress designated the WIPP facility "for the express purpose of providing a research and development facility to demonstrate the safe disposal of radioactive wastes resulting from the defense activities and programs of the United States exempted from regulation by the Nuclear Regulatory Commission (NRC)." The WIPP facility is operated by the U. S. Department of Energy (DOE). Transuranic waste that is disposed in the WIPP facility is defined by Section 2(18) the WIPP Land Withdrawal Act of 1992 (LWA) (U. S. Congress, 1992) as: "waste containing more than 100 nanocuries of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 20 years, except for:

> (A) high-level radioactive waste;
> (B) waste that the Secretary has determined, with the concurrence of the Administrator, does not need the degree of isolation required by the disposal regulations; or
> (C) waste that the NRC has approved for disposal on a case-by-case basis in accordance with part 61 of title 10, Code of Federal Regulations (CFR).

The half-lives of many TRU wastes isotopes are considerably longer than 20 years. For instance, the half-life of one isotope of plutonium is 24,000 years.

TRU waste is further classified as contact-handled (CH) and remote-handled (RH). CH-TRU waste has radioactivity levels that are low enough to permit workers to directly handle the containers in which the waste is kept. This level of radioactivity is specified as a dose rate of no more than 200 millirems per hour (mrem/hr) at the outside surface of the container. RH-TRU waste has a surface dose rate greater than 200 mrem/hr, so workers use remote manipulators to handle containers of RH-TRU waste. Transuranic mixed waste is CH-TRU or RH-TRU waste that also contains hazardous components, such as lead or organic solvents regulated in accordance with the Resource Conservation and Recovery Act. Transuranic waste also may be commingled with polychlorinated biphenyls which are regulated by the Toxic Substances Control Act. The waste that is authorized for emplacement is containerized dry TRU waste that must meet DOE/WIPP-02-3122, Rev.8.0, *WIPP Waste Acceptance Criteria,* in order to qualify for shipment to the WIPP facility. Containers of waste remain closed throughout the management and disposal processes at the WIPP facility.

The WIPP facility is a deep geologic repository mined within a 2,000-foot-thick bedded-salt formation. The WIPP repository sits in the middle of a 41-square-kilometer (16-square-mile) area under the jurisdiction of DOE pursuant to the LWA. The underground (UG) portion of the disposal facility, where waste is emplaced for disposal, is 2,150 feet beneath the ground surface.

The principal surface structure at the WIPP facility is the Waste Handling Building (WHB) where shipments of TRU waste are unloaded from their transporters and are inspected for compliance with shipping documentation. The WHB is designed and operated to prevent radiological

releases to the environment during waste handling operations. The area south of the WHB is a large parking area used to store TRU waste waiting to be unloaded in the WHB. This area is referred to as the Parking Area Unit (PAU). Other surface facilities include the hoist houses and headframes to provide underground access; support buildings and temporary structures to provide office space, training facilities and operations monitoring equipment; guard and security facilities including a guardhouse and perimeter fencing; safety facilities including emergency response equipment and personnel; water storage tanks and pump house; sewage lagoons; mined salt storage piles; maintenance buildings; ventilation buildings and ductwork; warehouse; and water control structures including berms, retention ponds and evaporation ponds. In addition, there are several parking areas for vehicles and laydown yards for construction equipment. The project area is south of the WHB in an area that includes a portion of that was previously disturbed during facility construction. (See Figure 2-2 for project location.)
The surface structures occupy the central portion of a 290-acre “Exclusive Use Area” which has been designated by the DOE as an area exclusively for the use of the DOE and its contractors in support of the WIPP Project. This area is considered the point of closest approach for members of the public for the purposes of analyzing consequences from accidents.

The WIPP facility design is based upon the receipt and emplacement of 500,000 cubic feet (ft^3) (14,158 cubic meters [m^3]) of contact-handled (CH) TRU mixed waste per year (Design Criteria, Waste Isolation Pilot Plant (WIPP), Revised Mission Concept – IIA (RMC-IIA) WIPP-DOE-71-Rev.3). In practice, the operation of the WIPP facility has been able to sustain about one-half this rate based on 17 TRU waste shipments per week, with 42 shipping weeks per year, and TRU waste being emplaced upon receipt with limited above ground storage capability. During the years 2000-2014, the WIPP facility received 11,763 shipments of CH TRU mixed-waste (or an average of 840 shipments per year). The WIPP facility is currently receiving five shipments per week due to reduced ventilation in the underground and, therefore, not capable of receiving and downloading as many shipments as the generator sites wish to make to satisfy agreements in their host states. Storage time limitations are set by the WIPP Hazardous Waste Facility Permit (Permit). The Permit limits the volume and time for storage of TRU mixed-waste in the parking area storage unit and Waste Handling Building (WHB), 59-days and 60-days, respectively.

The 10 weeks out of the year when shipments are not received encompass planned and unplanned maintenance outages (6-8 weeks’ duration) and estimated 2-4 weeks for interrupted shipments due to inclement weather conditions along the TRU waste transportation corridors. Because of planned and unplanned maintenance outages and inclement weather delays, an above ground storage capability would facilitate waste receipt during outages and downloading waste into the WIPP underground should there be weather delays impacting the transportation corridor.

Currently, DOE is storing TRU waste at a non-DOE site. State compliance agreements and regulatory deadlines for the shipment of waste are in place, with deadlines in the near term (fiscal year [FY] 2017 to 2018) and beyond.

1.2 Project Location

The project is located 26 miles east of Carlsbad, New Mexico in an approximately 35 to 40-acre (14 to 16 hectares) tract adjacent to and immediately south of the WIPP WHB that would be added to the Property Protection Area). The proposed project area is shown in Figure 1-1.

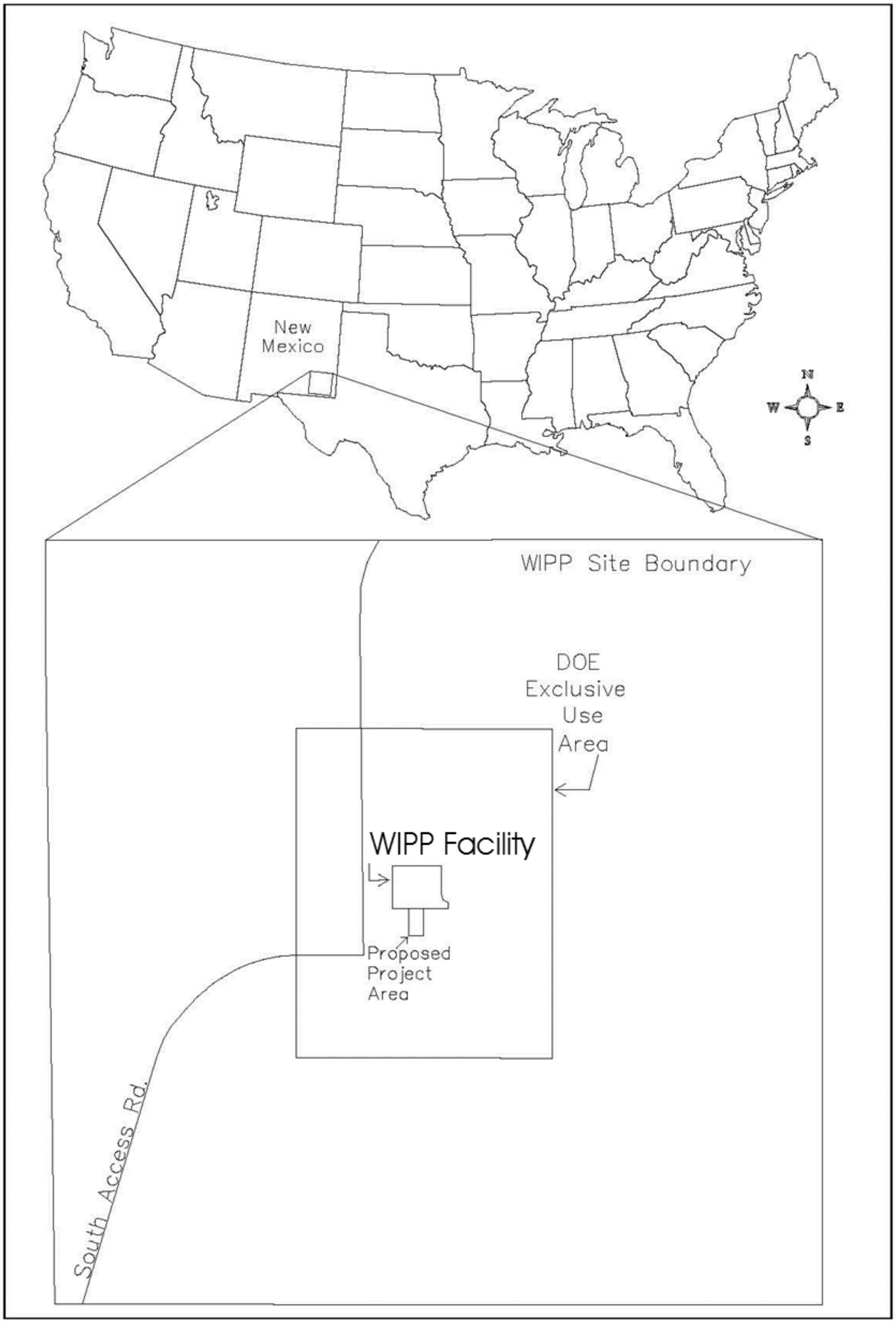

FIGURE 1-1. PROJECT LOCATION

1.3 Purpose of and Need for the Proposed Action

The purpose of the proposed action, which is described in detail in Chapter 2 of this Environmental Assessment (EA), is to enhance (i.e., provide additional above ground storage capability) the DOE's ability to store TRU waste above ground for up to one year. This enhanced storage ability will provide operational flexibility that is needed to reduce mission impacts from fluctuation in ship schedules and waste emplacement activities. These fluctuations typically result from planned and unplanned maintenance outages and weather events affecting the WIPP transportation corridors. The DOE has determined that the operational flexibility is needed to improve efficiency in the overall mission of TRU waste clean-up throughout the DOE complex. Because facility maintenance and transportation-related outages occur, the DOE has identified a mission-related need to develop expanded storage capability for TRU waste at the WIPP facility. The additional above ground storage capability would provide the DOE complex an additional means to safely and efficiently manage TRU waste transportation and storage functions, and to fulfill the mandate Congress has given the DOE – to safely dispose of defense-related TRU waste. In addition, the DOE has entered into several generator/storage site state compliance agreements which contain milestones for facility cleanup, including the shipment of waste to the WIPP facility. Some of these milestones are in the near term (fiscal year [FY] 2017 to 2018) and beyond. The proposed storage capacity will facilitate shipments from these sites even if the WIPP facility is undergoing an extended maintenance outage.

The Permit (NM4890139088-TSDF) describes the receipt and disposal of TRU waste shipments with no storage at the surface beyond the short-term administrative limits for the WIPP WHB and the PAU. A modification to the Permit is underway to authorize additional storage as proposed. DOE is currently paying for additional TRU waste storage at a non-DOE site.

Further support for proposing additional storage came from the New Mexico Environment Department (NMED). In settling the December 2014, Administrative Compliance Orders against the DOE with regard to alleged noncompliances stemming from the February 14, 2014 radiological incident at the WIPP facility, the NMED and DOE signed the "General Principles of Agreement" (NMED, 2015) which provided the framework for settlement discussions. In paragraph 8, the NMED recognized the utility of additional on-site storage and agreed to "… consider in a timely manner a permit modification request to allow for an above-ground storage facility for temporary on-site storage of transuranic waste at WIPP." The DOE has pursued this permit modification (DOE, 2016).

Currently, the WIPP facility maximum storage capacity is 6,854 ft^3 (194 m^3) of TRU waste storage in the WHB, including surge storage. The WIPP PAU maximum storage capacity is 8,863 ft^3 (251 m^3) including surge storage. The additional above ground storage capacity would be in addition to the existing storage capacities of the WHB and PAU. Concrete overpack containers would be used to manage TRU waste stored in this above ground storage unit at the WIPP facility. The increased storage capability would allow the DOE to conduct waste disposal operations at the WIPP facility somewhat independently of the variations that occur in shipping operations. If one of the operations has a disruption, the other operation would be unaffected, at least until any inventory in storage is disposed of. For example, if shipping is stopped due to weather delays or other emergencies, the WIPP facility staff can continue to process the waste from the AGSC facility while awaiting shipment restart. Likewise, if a maintenance outage prevents the disposal of TRU waste at the WIPP facility, shipments can continue until the AGSC facility is full. A full above ground storage facility could receive and store the equivalent of 408 Ten-drum Overpacks with a capacity of 160 ft^3 (4.5 m^3) each.

The proposed action is needed to ensure the DOE plan and mission to provide effective management through the anticipated lifetime of the WIPP Project mission continues to be met. The proposed action would provide efficiencies in operational and support capabilities for shipment of CH TRU mixed waste and RH TRU mixed waste in shielded containers from generator sites for more shipping weeks per year, while allowing DOE to manage and maintain the WIPP facility in an effective and safe manner.

1.4 NEPA Process and Public Involvement

The National Environmental Policy Act (NEPA) requires federal agencies to consider the potential environmental impacts of their proposed actions such as constructing and operating the proposed project to improve the TRU waste shipping process efficiency throughout the DOE complex and reasonable alternatives before making decisions. DOE has prepared this draft environmental assessment (DEA) to determine whether the potential environmental impacts of the proposed project would be significant to human health and the environment in accordance with DOE's NEPA implementing procedures, 10 CFR Part 1021, and the regulations promulgated by the Council on Environmental Quality for implementing NEPA, 40 CFR Parts 1500-1508. This DEA will be released for a 30-day public review and comment period. After this public review/comment period, DOE will review the comments received and prepare a Final Environmental Assessment, and determine whether to issue a Finding of No Significant Impact or prepare an Environmental Impact Statement.

The resource-specific environmental impact analysis presented in this DEA was performed in compliance with relevant environmental laws applicable to the resource areas analyzed. Key documents previously prepared for the WIPP Project (i.e., the DOE/EIS-0026-S2 and SA-10) were reviewed regarding their applicability to the subject DEA. This review was conducted with respect to resource-specific existing conditions (i.e., the affected environment). This is because the previously prepared NEPA documents cover/address the geographic area of the proposed project. The impact analysis in this DEA has been prepared specifically for this project in order to provide sufficient information to support a decision regarding the environmental impacts of the proposed project. Consultations with other agencies (e.g., State Historic Preservation Officer [SHPO], U.S. Fish and Wildlife Service) were not required or undertaken in connection with this DEA.

As noted above, the DEA will be released for a 30-day public review and comment period as public involvement is a key component of the NEPA process. Regarding the public involvement/participation process, the public was made aware of the preparation of this DEA via the publication of a Notice of Availability (NOA) on mm/dd/year in the following news publications: This DEA was made available to the public at the following DOE website: @@@ The publication of the NOA initiated the 30-day public review and comment period commencing on mm/dd/year and ending on mm/dd/year. For comments to be considered in the preparation of the Final Environmental Assessment, they must be received by close of business on mm/dd/year (end date of comment period). Written comments may be provided by mail to the contact presented below or they may be submitted to the following email link:

WIPP.EA@wipp.ws

Or write:

CBFO Document Manager, Point-of-contact:

Anthony Stone, Carlsbad Field Office

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The DOE will review the comments provided by the public and modify the DEA as appropriate based on the comments. Appendix A of this DEA presents the NOA. Appendix A of the Final EA will provide the public comments received as well as responses to the comments.

2. PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action

The proposed action is to add an above ground hazardous waste container storage unit at the WIPP facility for storage of 65,280 ft^3 (1,836m^3) of TRU mixed waste for up to one year. This CH TRU mixed waste storage capacity also includes RH TRU mixed waste in shielded containers that are managed and stored as CH TRU mixed waste.

The AGSC project would add capacity for the WIPP facility to store TRU mixed waste on the surface prior to disposal in the U/G. Storage would be accomplished using concrete overpack containers (see Figure 2.1) placed in an outdoor TRU mixed waste storage area, referred to as the Overpack Unit. As illustrated in Figure 2-1, the concrete overpack container may hold any TRU waste container sized to be shipped in a Transuranic Package Transporter Model II (TRUPACT-II) or a Half-Package Transporter (HalfPACT) shipping package. This Overpack Unit would provide the ability to safely store additional CH TRU mixed waste on the surface of the WIPP facility during times when the facility is undergoing a planned or unplanned maintenance activity, or during any event that delays waste emplacement or delays shipments to the WIPP facility (e.g., inclement weather). For example, if inclement weather (such as snowfall in northern New Mexico) delays shipments, the DOE would have the ability to process waste that has been stored in the Overpack Unit. The DOE could schedule the removal and disposal of waste stored in the Overpack Unit during periods when shipments are slower, during a separate shift, or on weekends. The one-year storage limit would provide sufficient time and flexibility to schedule disposal of waste that is stored in the Overpack Unit.

The proposed storage capability would represent a significant improvement in operational flexibility and efficiency of waste processing. The current Permit requires shipments of waste from the generator sites to be stopped when any event results in an interruption to normal waste handling operations that exceeds three days. Storing waste in the Overpack Unit would eliminate the need for this stoppage and allow generator sites to continue shipments. Upon completion of the AGSC project, the Permittees would have the capability and space to store up to 136 shipments (the equivalent of eight weeks of shipments at a rate of 17 shipments per week).

Tracking of the waste while at the WIPP facility is required by the Permit and includes documenting where the waste containers are within the facility, whether they are in the PAU, WHB, Overpack Unit, or emplaced U/G in a Hazardous Waste Disposal Unit.

2.2 Alternatives Considered

2.2.1 Alternative 1

Project-specific Construction Components

The components of Alternative 1 include the construction and operation of an Overpack Unit as described in the proposed action. The constructed facility would include a concrete pad on which up to 408 concrete overpack containers would be placed. Standard construction methods would be used to construct the facility such as grading and paving of the project area, pouring of a concrete slab, fire water plumbing, fencing, lighting, and geotextile-lined water run-off pond.

The concrete pad would have the following dimensions:

- Length: 712 ft (217 m)
- Width: 135.5 ft (41.3 m)
- Area: 96,500 square feet (ft^2) (8,965 square meters [m^2])
- Pad thickness: 14 inches (in.) (35.6 centimeters [cm])

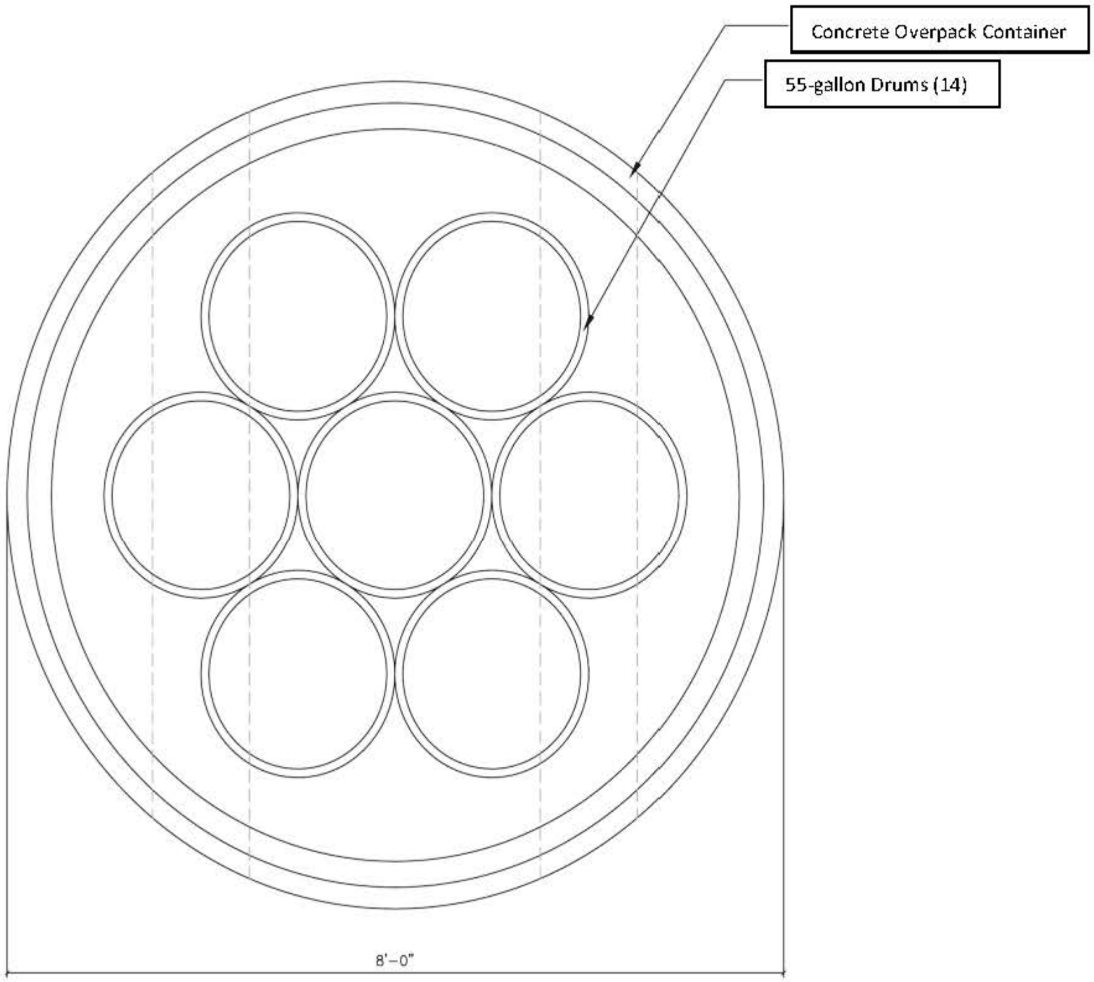

FIGURE 2-1. CONCRETE OVERPACK CONTAINER (TOP VIEW)

Outside of the fence, a 20-ft (6.1-m) gravel road would be constructed as a wildfire break and to provide a line of sight for security inspections. To prevent run-on of water, the rebar-reinforced concrete pad would have a berm that is engineered to prevent run-on of overland flowing water and contain and collect any liquid spills from waste handling operations. The berm would be approximately 8 in. (20.3 cm) high by 12 in. (30.5 cm) wide. A 7-ft (2.1-m) fence topped with about 1-ft (0.3 m) of barbed wire would be placed along the periphery of the facility. The minimum of 48 in. (121.9 cm) of aisle space would be established between the concrete overpack containers to enable inspection and provide emergency equipment access.

The Property Protection Area (PPA) fence would be extended to surround the facility and a 20-foot (ft) (6-meter [m]) outer perimeter would be cleared for security road visibility and as a firebreak. As a result, the PPA would increase from approximately 35 to 40-acres (14 to 16-hectares).

Empty concrete overpack units would be stored on the AGSC pad or other appropriate location, clearly marked, “EMPTY.” When needed, the empty concrete overpack units will be transported back into the WHB for loading and returned to the AGSC facility for storage. Movements of the waste will be logged and tracked; and containers inspected in accordance the Permit.

Storm water runoff from the concrete pad would be conveyed via gravity to a drainage pipe (treated to avoid corrosion) that would be connected to a new dedicated storm water retention pond (i.e., an evaporation pond). The pond would be sized for a 100-year flood plus 100 percent for over-flow capacity. The pond would be constructed to allow for a large surface area. Evaporation is a proven method in the arid Southwest to address accumulation of storm water. There would be no intent to remove the water for disposal, unless the liners require replacement or the facility is decommissioned. The pond would be appropriately designed and, at a minimum, would be double-lined with an interstitial layer between the liners. A civil engineer or equivalent expert would specify the liner type and proper-engineered material (representing the layer between the liners) and incorporate additional precautions to ensure the containment of the storm water runoff from the concrete pad area. The NMED – Ground Water Quality Bureau currently regulates the lined evaporation ponds at the WIPP facility. It is expected that this pond would need to be included in the current Discharge Permit 831 that is issued to the DOE by the NMED – Ground Water Quality Bureau.

The concrete pad area would be inspected regularly by WIPP facility staff to ensure that there are no leaks or spills from the concrete overpack containers. In the unlikely event of a leak or spill, it would be cleaned up and properly disposed of in accordance with standard operating procedures that will be prepared to implement DOE/WIPP radiation protection policies in effect at the time.

Figure 2-2 illustrates the components of Alternative 1 to be constructed, as well as existing facilities that are used as part of the TRU mixed waste storage process.

Project-Specific Operations

The proposed TRU mixed waste storage operations process would begin with the WIPP Operations personnel transporting an empty concrete overpack container into the WHB using a forklift and positioning it in front of the TRUPACT-II Unloading Dock (TRUDOCK). Next, the personnel would remove the empty concrete overpack lid and set it aside on the designated stand. TRU mixed waste containers would be removed from the CH packaging on the

TRUDOCK. The TRUDOCKs are equipped with a Vent Hood System (VHS). Functionally, the VHS will draw the TRU waste container headspace gases that may have accumulated in the transportation package, convey them through a HEPA filter, and ultimately duct them through the WHB exhaust ventilation system. As the waste is removed from the CH packaging, the payload containers would be inspected. Containers that are not of good integrity are dispositioned in accordance with existing standard operating procedures (i.e., WP 05-WH1011, *CH Waste Processing*). Once the waste is lowered into the empty concrete overpack container, the annual inspection and storage period would begin. The lid would then be placed back on the concrete overpack container. This would provide secondary containment for the TRU mixed waste. Using a forklift, TRU mixed waste handling personnel would then transport the loaded concrete overpack container holding the TRU mixed waste outside of the airlocks. An all-terrain forklift would then transport the loaded concrete overpack container into the Overpack Unit for storage for up to one year.

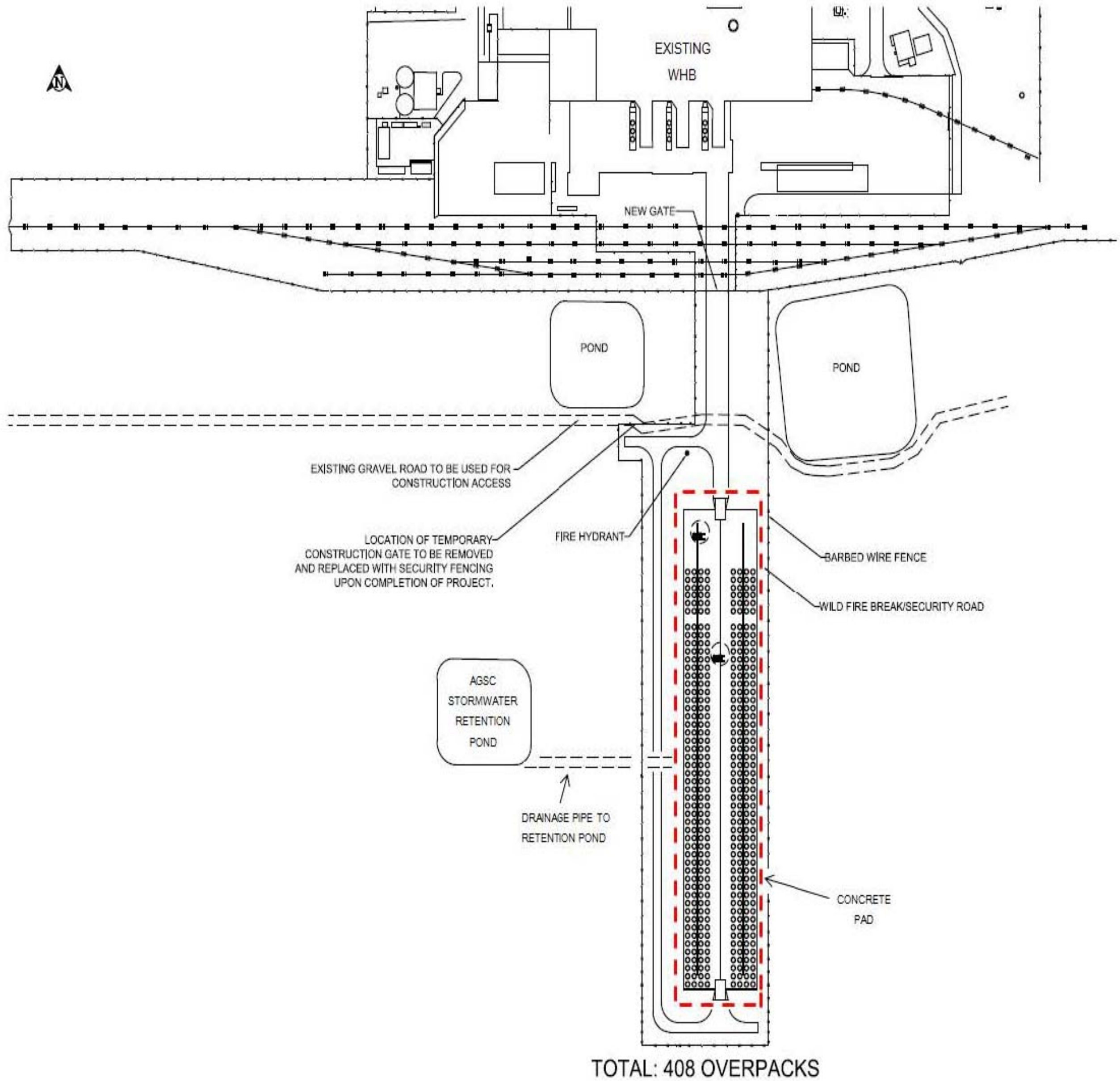

FIGURE 2-2. OVERPACK UNIT – ALTERNATIVE 1

When it is time to emplace the TRU mixed waste into the WIPP U/G, personnel would retrieve the loaded concrete overpack containing the TRU mixed waste from the Overpack Unit and move it using a forklift outside the WHB. The concrete overpack would then be carried into the WHB using an electric forklift and placed in the TRUDOCK. The concrete overpack lid would be removed and radiological surveys performed as required. The TRU mixed waste would be removed from the concrete overpack, inspected for spills or leaks, and, if found to be in good condition, placed on a facility pallet and readied for emplacement in the WIPP U/G. The empty concrete overpack would then be made ready to receive other TRU mixed waste for storage or to be moved out of the WHB and staged for future use.

In summary, key features and attributes of the concrete overpack containers and the Overpack Unit include:

- The concrete overpack would serve dual functions: (1) as a fire barrier for external fire events, and (2) to prevent the buildup of flammable gasses above applicable limits.
- The Overpack Unit concrete pad for TRU mixed waste loaded concrete overpack containers would have a berm that allows for the control of spills.
- The Overpack Unit would have a fire water supply line with hydrant.
- Ample space would be required between stored concrete overpack containers to allow access for personnel performing inspections and emergency personnel as needed.
- In accordance with the Fire Hazard Analysis, a 20-ft (6.1-m) minimum cleared area would be maintained around the storage area to protect it from wildfires.
- Concrete overpack containers would be manufactured with pockets for forklift tines, eliminating the need for pallets on the concrete pad.

2.2.2 Alternative 2

Alternative 2 consists of the same construction components as described under Alternative 1, but includes construction of a TRUDOCK facility for unloading operations (see Figure 2-3), structure covering the entire Overpack Unit (Figure 2-4) such as a Sprung® structure, and mobile loading and unloading equipment (Figure 2-5). A Sprung® structure is an enclosure that is designed with durability to withstand heavy snow loads to hurricane force winds, but has the advantage of being constructed over a shorter duration and at a lower cost compared to a conventional metal building. Regarding the proposed TRU mixed waste storage operations process, the TRUPACT-IIs or HalfPACTs would arrive at the Overpack Unit with a payload designated by the operating staff for storage and the contents of the TRUPACT-IIs or HalfPACTs would be placed in the Sprung® structure using mobile loading and unloading equipment. Figure 2-5 illustrates the mobile loader in operation.

As with Alternative 1, whenever a disposal time for the containers within the concrete overpack is determined, the concrete overpack containers would be moved from the AGSC facility and transported to the WHB via forklift. In the WHB, the concrete overpack containers would be unloaded and the containers placed upon a facility pallet. Movement of the payload containers in the TRUPACT-IIs or HalfPACTs and the concrete overpack containers would be tracked. Tracking of the waste includes knowing where the waste containers are within the facility, whether they are in the PAU, WHB, Overpack Unit, or emplaced U/G in a Hazardous Waste Disposal Unit.

The capacity for Alternative 2 is 408 concrete overpack containers, the same capacity as Alternative 1. The mobile loader includes a gantry crane that would be used for the vertical unloading of the TRUPACT-IIs or HalfPACTs. The payload containers would undergo radiological contamination checks. The outer and inner containment vessels would be opened to allow for the venting of the TRUPACT-IIs or HalfPACTs inside the Sprung® structure.

The vented air from the TRUPACT-IIs or HalfPACTs would travel through the vent hood system (VHS) uptake and pass through a high efficiency air particulate (HEPA) filter system to capture any radioactive particulate. With the VHS, a confined and controlled set of prevailing air currents would be induced by the system blower. The VHS would function as a local exhaust system to effectively control radiologically contaminated airborne dust particles (and volatile organic compounds) at essentially atmospheric pressure conditions.

Functionally, the VHS would draw the TRU mixed waste container headspace gases, convey them through a HEPA filter, and ultimately duct them through the AGSC exhaust ventilation system. Volatile organic compounds would pass through the HEPA filter and would be conveyed to the ventilation exhaust duct system. The system principally consists of a functional aggregation of (1) a vent hood assembly, (2) HEPA filter assemblies to capture any airborne radioactive particles, (3) a blower to provide forced airflow, (4) ductwork, (5) flexible hose, and (6) monitoring station.

If the containers inside the TRUPACT-II or HalfPACTs are determined to be clean, they would be placed into a concrete overpack. The concrete overpack would then be moved to the Overpack Unit and the location recorded.

As with Alternative 1, when it is time to emplace the TRU mixed waste into the WIPP U/G, personnel would retrieve the loaded concrete overpack containing the TRU mixed waste from the Overpack Unit and move it using a forklift outside the WHB. The concrete overpack would then be carried into the WHB using an electric forklift and placed in the TRUDOCK. The concrete overpack lid would be removed and radiological surveys performed as required. The TRU mixed waste would be removed from the concrete overpack, inspected for spills or leaks, and, if found to be in good condition, placed on a facility pallet and readied for emplacement in the WIPP U/G. The empty concrete overpack would then be made ready to receive other TRU mixed waste for storage or to be moved out of the WHB and staged for future use.

2.3 No Action Alternative

Under the No Action Alternative, DOE would not proceed with the AGSC Project (i.e., the proposed action would not be implemented). The No Action Alternative would require no additional action for the DOE regarding increased storage at the WIPP facility. Storage would be limited to the space available in the WHB and in the PAU. In the event of delays of shipments from storage/generator sites, there would be no backlog of TRU waste available for disposal once the inventories in the WHB and PAU were processed. Further, maintenance outages at the WIPP facility will lead to a cessation of shipments once the on-site storage capacities of the WHB and PAU are reached.

The No Action Alternative represents the affected environment or existing conditions for each of the environmental resource areas discussed in Chapter 3 of this EA. Under this alternative, the impacts of the proposed action would not take place, and ongoing activities that are described in the affected environment would continue.

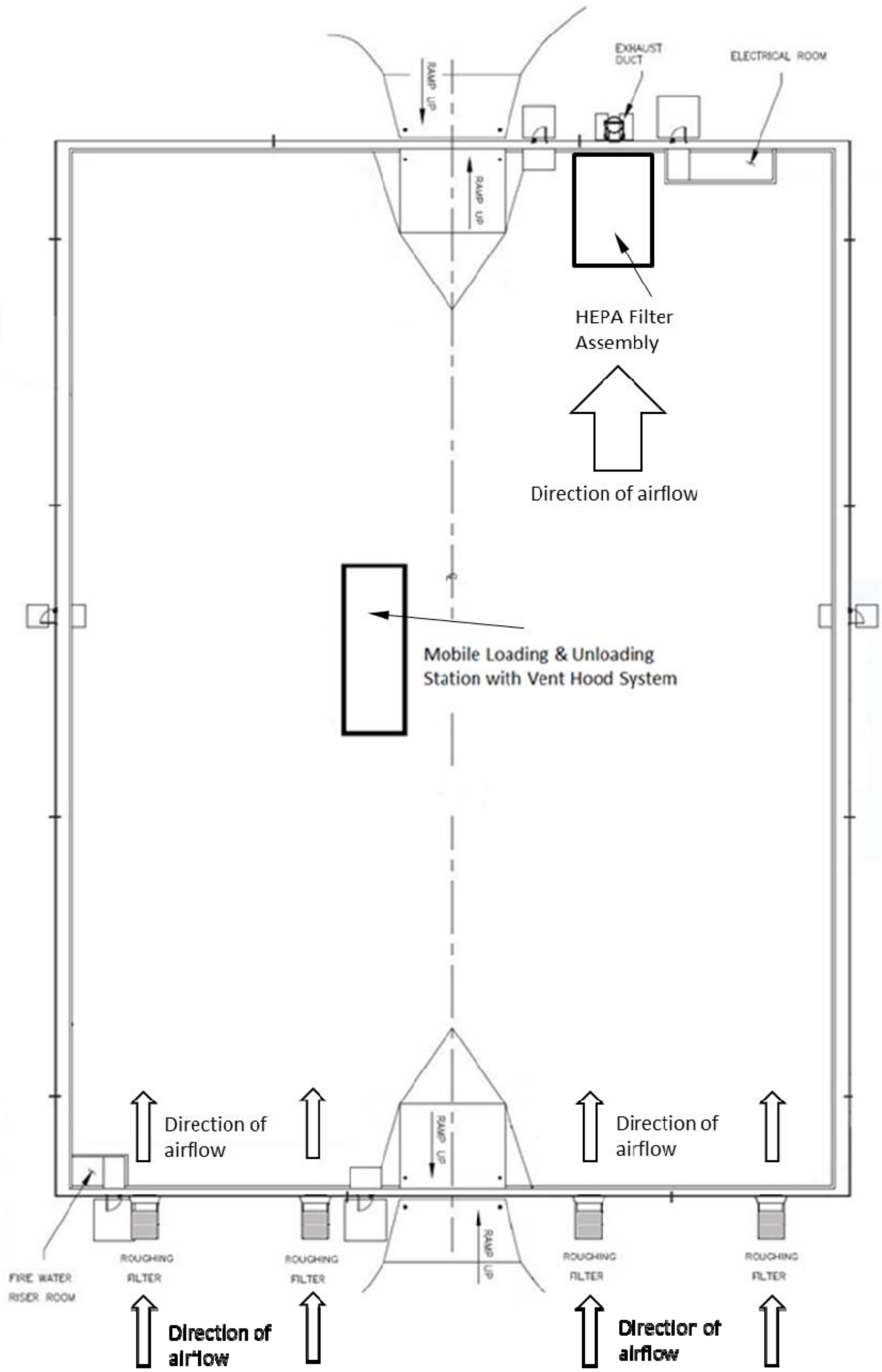

FIGURE 2-3. OVERPACK UNIT – ALTERNATIVE 2

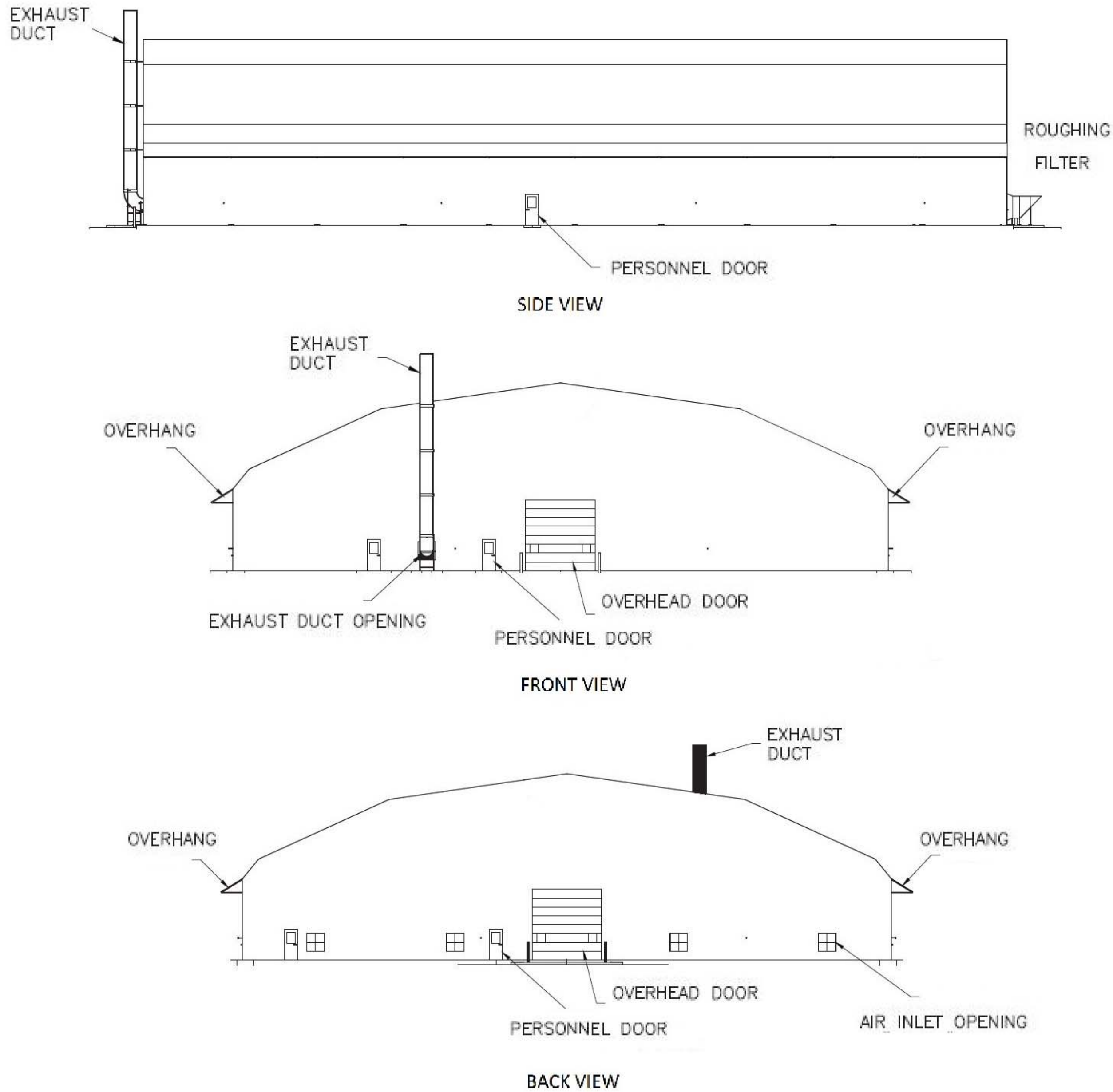

FIGURE 2-4. GROUND LEVEL VIEW OF OVERPACK UNIT – ALTERNATIVE 2 CONCEPT STRUCTURE

FIGURE 2-5. MOBILE LOADING AND UNLOADING EQUIPMENT

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

This chapter describes the affected environment or existing environmental conditions in and around the AGSC project area, as well as the environmental consequences for resources potentially affected by implementation of Alternatives 1 and 2 as described in Chapter 2. Information presented in this chapter represents existing conditions against which the alternatives are evaluated to identify potential impacts (refer to the environmental consequences sections in this chapter). In compliance with NEPA regulations (40 CFR § 1502.15), the description of the affected environment focuses only on those resources potentially subject to impacts. In addition, the level of analysis is commensurate with the anticipated level of impact (or the sliding scale approach). Accordingly, the discussion of the affected environment (and associated environmental consequences) focuses on geology and soils, hydrology/water quality, air quality, cultural resources, hazardous materials and hazardous wastes, nuclear safety, waste and facility operations, and visual resources. Conversely, the following resource areas were evaluated, but not carried forward for detailed analysis in this DEA because the proposed action and supporting action alternatives would have only negligible impacts on these resources.

Transportation. Implementation of the proposed action would have no effect on TRU waste transportation because the number of shipments to the WIPP facility from the generator sites does not increase. The total number (lifetime) shipments and the annual shipments to or from the WIPP facility as previously analyzed in the *Supplemental Environmental Impact Statement II* (DOE/EIS-0026-S-2) and the December 2016 *Supplement Analysis* (DOE/EIS-0026-SA-10) are bounding numbers and are assumed to remain the same. There will be a temporary increase in transportation associated with the shipment of materials and equipment needed to construct the AGSC facility; however, these shipments will be infrequent. The construction staff, estimated to be about 50, will add to daily automobile traffic.

Land Use. Implementation of the proposed action would have no impact on land use because it does not introduce a new land use and the proposed activities are compatible with WIPP land uses as specified in Section 3(3) of the LWA.

Noise. Proposed action construction activities would require the use of heavy equipment for site preparation and development that would result in temporarily increased noise levels within the immediate area; however, noise levels would be typical of standard construction activities and would cease upon completion of proposed construction. Proper hearing protection would be worn per the DOE occupational safety and health program. Operation of various components and facilities of the project would generate instantaneous noise levels between 60 and 70 decibels; however, due to the attenuation of noise with distance from the noise source, noise levels from both construction and operation of the proposed action would be reduced to ambient levels before reaching the nearest sensitive noise receptor. Since publication of the 2016 SA, no known new noise receptors have been identified in the WIPP ROI (DOE/EIS-0026-SA-10). Chapter 9, Section 9.3.1 of the Final Environment Impact Statement (FEIS) (DOE/EIS-026) contains a thorough noise evaluation for construction activities similar to those in the proposal. The nearest noise receptor remains the Mills Ranch, three miles to the south.

Socioeconomics and Environmental Justice. Proposed construction activities would result in a minor short-term benefit to the region's economy. Attempts are made to hire and buy services and equipment locally. Even if an out-of-town construction contractor is used, construction employees would be accommodated in the local area for the duration of construction. Implementation of the proposed action would not appreciably change the economic character or stability of the surrounding area.

Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, Executive Order (EO) 12898, requires that "each Federal Agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health effects of its programs, policies, and activities on minority populations and low-income populations." Due to the remote location of the WIPP facility and the large land withdrawal area, there are no minority or low-income populations adjacent to the project area that would be impacted by the proposed action. Therefore, impacts related to EO 12898 would not occur.

A large number of minority and low-income individuals are located in Eddy and Lea counties, New Mexico. In this area, 53 percent of the population is classified as minority, while 15.5 percent is classified as low-income. Although the number of minority exceeds 50 percent of the total population in the area, the number is not meaningfully greater than the state average based on 2010 Census data. The number of low-income individuals does not exceed 50 percent of the total population in the area, (DOE/EIS-0026-SA-10); therefore, no disproportionate impacts to low-income and minority populations are anticipated.

Biological Resources. In 1996, DOE conducted a Threatened and Endangered Species Survey on the WIPP Land Withdrawal Area (WLWA) and associated lands to investigate the potential for impact to rare, threatened, endangered, or sensitive plant or animal species as a result of the potential actions presented in SEIS-II. The 1996 survey included an assessment of suitable habitats for these species. No threatened, endangered, or state-listed species were found on the WLWA during the survey. The data reported in the survey, which support the conclusions of other studies, suggest that dense and permanent populations of these species are not presently established on WIPP lands.

Two species, previously listed as threatened or endangered, live in the shinnery oak sand dunes areas near the WIPP site. These two species are the dunes sagebrush lizard (*Sceloporus arenicolus*) and the lesser prairie chicken (*Tympanuchus pallidicinctus*). On June 19, 2012, the proposal to list the dunes sagebrush lizard was withdrawn under:

- the New Mexico Game and Fish Endangered Species Act
- the U.S. Fish and Wildlife Endangered Species Act (candidate species)

The U.S. Fish and Wildlife Service withdrew the proposed rule to list the dunes sagebrush lizard as endangered under the Endangered Species Act of 1973 based on the conclusion that the threats to the species as identified in the proposed rule no longer are as significant as believed (*Endangered and Threatened Wildlife and Plants; Withdrawal of the Proposed Rule to List Dunes Sagebrush Lizard*, 77 FR 36871).

On July 20, 2016, the U.S. Fish and Wildlife Service published a final rule formally vacating the previous listing of the lesser prairie chicken as threatened under the Endangered Species Act. The listing of the lesser prairie chicken was vacated in order to comply with a court order regarding a challenge to the listing. (*Endangered and Threatened Wildlife and Plants; Lesser Prairie Chicken Removed from the List of Endangered and Threatened Wildlife,* 81 FR 47047).

According to the most recent Annual Site Environmental Report (DOE/WIPP-15-8866, *Waste Isolation Pilot Plant Annual Site Environmental Report for 2014,* September 2015), there have been no substantive changes in the biological resources at the WIPP site since SEIS-II. During 2014, no species of plants or animals that are protected by the *Endangered Species Act* were identified within the WLWA (*Supplement Analysis for the Waste Isolation Pilot Plant Site-Wide Operations,* DOE/EIS-0026-SA-10).

3.1.1 Intentional Destructive Acts

Following the terrorist attacks of September 11, 2001, DOE has implemented measures to address the risk and consequences of potential terrorist attacks on its facilities. DOE subsequently issued guidance on the analysis of accidents and intentional destructive acts in its NEPA documents (DOE 2002; Borgstrom 2006). In SA-10 (DOE/EIS-0026-SA-10), DOE considered security scenarios involving intentional destructive acts to assess potential environmental impacts. The analysis addresses both the storage and disposal of TRU waste at the WIPP facility.

The potential impacts of intentional destructive acts (i.e., acts of sabotage or terrorism) would be minimal and no greater than the impacts of a transportation or facility accident as analyzed in SEIS-II because the initiating forces and resulting quantities of radioactive or hazardous materials potentially released by an intentional destructive act would be similar to those for the severe accident scenarios as discussed in SEIS-II (DOE/EIS-0026-S-2); intentional destructive and accident scenarios both involve the same containers with the same radionuclide loadings.

3.2 Geology and Soils

3.2.1 Existing Environment

3.2.1.1 Geology

The WIPP site that includes the proposed project area is located 26 miles east of Carlsbad in the Chihuahuan Desert of southeastern New Mexico. Since the mid-1970s continuing through the opening of the WIPP facility in 1999, and into the operational period, an extensive program of site characterization and validation was conducted. The results of these site investigation studies have been summarized in numerous publications, including the WIPP *Geological Characterization Report* (SAND78-1596); the *WIPP Design Validation Final Report* (DOE/WIPP-86-010); and *Summary of Site-Characterization Studies Conducted from 1983 through 1987 at the Waste Isolation Pilot Plant (WIPP) Site Southeastern New Mexico* (SAND88-0157).

Water-bearing zones that have been identified and studied at and near the WIPP site are the middle Dewey Lake Redbeds Formation (Dewey Lake) and the overlying Triassic Dockum group (including the Santa Rosa Formation [Santa Rosa]); Culebra and Magenta Dolomite Members of the Rustler Formation (Culebra, Magenta, Rustler); the Rustler-Salado Formation (Salado) contact; and the Bell Canyon Formation (Bell Canyon). In addition, the nature and extent of anthropogenic shallow subsurface water (SSW) has been characterized within the Santa Rosa and Dewey Lake. These units and other formations in the WIPP stratigraphy that underlie the proposed project area (see Figure 3-1) are discussed below.

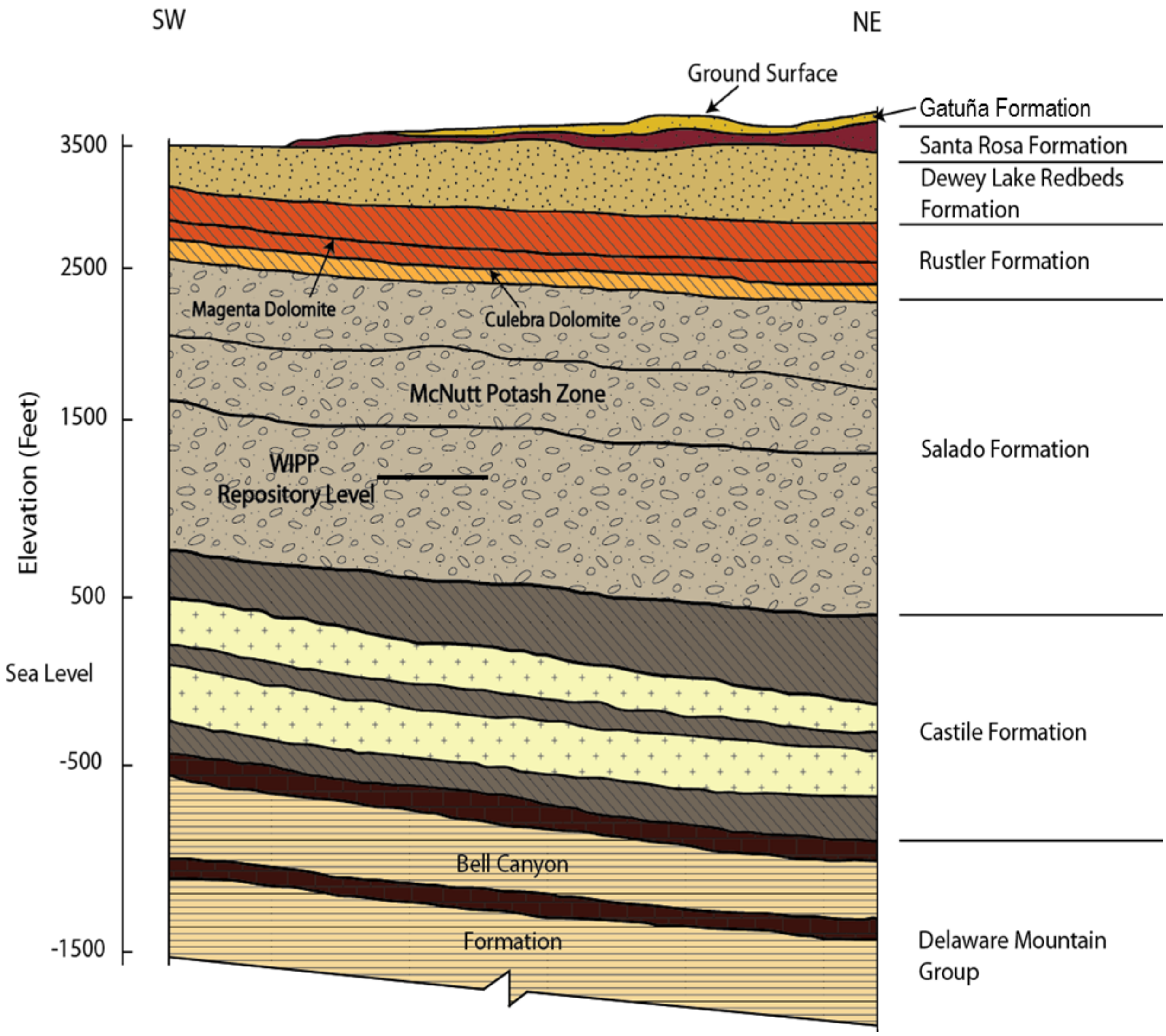

FIGURE 3-1. AGSC PROJECT AREA STRATIGRAPHY

Bell Canyon Formation

The Bell Canyon consists of channel sandstones and siltstones with interbedded limestone and shale. The Bell Canyon is overlain by the Castile Formation (Castile).

The Castile is a thick layer of nearly impermeable anhydrites and halites that isolate the Salado Formation (Salado) from the deeper water-bearing rocks. The Bell Canyon is considered for the purposes of regional groundwater flow to form a single hydrostratigraphic unit about 1,000 ft (305 m) thick (Figure 3-1). Tests at five boreholes (Atomic Energy Commission [AEC]-7, AEC-8, Energy Research and Development Administration [ERDA]-10, DOE-2, and Cabin Baby [CB]-1) (Mercer, 1983; WTSD TME 020; SAND86-1364), indicate a range of hydraulic conductivities from 5×10^{-02} ft/day to 1×10^{-06} ft/day (1.7×10^{-07} to 3.5×10^{-12} meters per second [m/s]). The pressure measured in the Bell Canyon at DOE-2 and CB-1 boreholes at the time of the Compliance Certification Application ranged from 1,827 to 1,929 pounds per square inch (psi) (12.6 to 13.3 megapascals).

Fluid flow in the Bell Canyon is markedly influenced by the presence of the extremely low-permeability Castile and Salado above it, which effectively isolates the Bell Canyon from interaction with overlying units. The exception are areas where the Castile is absent because of erosion or non-deposition, such as in the Guadalupe Mountains, or where the Capitan Reef is the overlying unit. Because of the isolating nature of the Castile and Salado, fluid flow directions in the Bell Canyon are sensitive only to gradients established over very long distances. At the WIPP site, the brines in the Bell Canyon flow northeasterly under an estimated hydraulic gradient of 25 to 40 ft/mi (4.7 to 7.6 m/km [kilometer]) and discharge into the Capitan aquifer. Velocities are on the order of tenths of feet per year (centimeters per year), and groundwater yields from wells in the Bell Canyon are 0.6 to 1.5 gallons (2.3 to 5.8 liters [L]) per minute. The fact that flow directions in the Bell Canyon under the WIPP site are inferred to be almost opposite to the flow directions in units above the Salado is not of concern. This is because flow in the units above the Salado is controlled by local variations in water table elevation, whereas flow in the Bell Canyon is controlled by regional gradients. The presence of the Castile and Salado makes the flow in the Bell Canyon sensitive to gradients established over long distances, whereas flow in the units above the Salado is sensitive to gradients established by more local variations in water table elevation.

Castile Formation

The Castile is composed of a sequence of three thick anhydrite beds separated by two thick halite beds. The Castile acts as an aquitard that separates the Salado, where the repository is located, from the underlying water-bearing sandstones of the Bell Canyon.

No regional groundwater flow system is present in the Castile. The only substantial water present in the formation occurs in isolated brine reservoirs in fractured anhydrite. These brine reservoirs are unconnected with surrounding aquifers or the surface, and have little potential to dissolve the host rocks or move through them.

Salado Formation

The massive halite beds within the Salado host the WIPP repository. The Salado represents a regional aquiclude due to the hydraulic properties of the bedded halite of which it is mostly comprised. In the halites, the presence of circulating groundwater is restricted because halites do not readily maintain primary porosity, solution channels, or open fractures owing to creep closure. The results of hydraulic conductivity testing, both within the repository and from the surface, are generally consistent with a hydraulic conductivity of the undisturbed halite rock of less than 2.5×10^{-13} ft/s (7.5×10^{-14} m/s), with the purer halites (less argillaceous) having even lower hydraulic conductivity. Anhydrite interbeds typically have hydraulic conductivities ranging from 2.5×10^{-13} to 2.5×10^{-11} ft/s (7.5×10^{-14} to 7.5×10^{-12} m/s) ("Hydrology and Hydraulic Properties of a Bedded Evaporite Formation," [Beauheim and Roberts, 2002]). The only significant variation to these extremely low hydraulic conductivities occurs in the disturbed rock zone of the U/G workings (Stormont et al., 1991). However, it is expected that the salt will heal due to creep closure in a relatively short period of time (100 years) to regain low hydraulic conductivity characteristics.

Rustler-Salado Contact

The contact between the Rustler and Salado was studied and discovered to contain minor amounts of non-potable water. In Nash Draw, the contact exists as a dissolution residue capable of transmitting water. Eastward from Nash Draw toward the WIPP site, the amount of dissolution decreases and the transmissivity of this interval decreases. Tests within the boundary of the WIPP site showed very low transmissivities, ranging from 3×10^{-5} to 3×10^{-3} ft²/day (2.8×10^{-6} to 2.8×10^{-4} m²/day) (*Geohydrology of the Proposed Waste Isolation Pilot Plant*, Mercer, 1983).

Mercer (1983) provides data from 16 wells sampled in the WIPP site vicinity from the Rustler-Salado and 4 wells that sampled the dissolution residue in the uppermost Salado. The largest concentrations of total dissolved solids (TDS) in the WIPP water-bearing formations are contained in the Rustler-Salado contact. TDS values ranged from 67,300 milligrams per liter (mg/L) in well P-15 (now plugged and abandoned) to 411,000 mg/L in well H-05c (not open to formation). Sulfates and chlorides of calcium, magnesium, sodium, and potassium make up the primary dissolved mineral constituents of this brine.

Rustler Formation

The Rustler is made up of five distinct members. These are, from top to bottom (also newest to oldest), the Forty-niner, Magenta, Tamarisk, Culebra, and Los Medaños. The Culebra and Magenta (discussed below) are significant water-bearing zones with confining layers above and below.

Culebra

The Culebra is the most transmissive hydrologic unit within the WLWA boundary and is some 1,000 ft (300 m) above the repository level. It is considered the most significant potential hydrologic pathway for a release to the accessible environment. Tests show that the Culebra is a fractured, heterogeneous dolomite system with varying local anisotropic characteristics (Mercer and Orr, 1977; Mercer, 1983; SAND86-2311; SAND87-0039; SAND98-0049). Calculated transmissivities for the Culebra within the WIPP site boundary have a wide range with values from 9.0×10^{-2} ft²/day to approximately 69 ft²/day (8.3×10^{-3} m²/day to approximately 6.4 m²/day) (hydraulic conductivities range from 1.19×10^{-3} m/day to 9.14×10^{-1} m/day). However, the majority of the values are less than 9.3×10^{-2} m²/day (Hydraulic Conductivity of 1.3×10^{-2} m/day) (1 ft²/day) (SAND87-0039). Transmissivities generally decrease from west to east across the WIPP site. The regional flow direction of groundwater in the Culebra is generally to the south.

Water quality in the Culebra varies greatly. The TDS values range from 3,300 mg/L at well H-09bR to about 353,000 mg/L at well SNL-06. These two wells are fairly remote from the WIPP site but, even at closer proximity, a marked variation in the water quality is observed. At well H-02a (now plugged), located 0.5 mile (0.8 km) west of the center of the WIPP site, Culebra water has a TDS of 13,500 mg/L, while at well H-15, which lies one mile east of the center of the WIPP site, it has a TDS of 231,000 mg/L. The chemical constituents consist predominantly of sulfates and chlorides of calcium, magnesium, potassium, and sodium.

Magenta

The Magenta is separated from the Culebra by anhydrite, gypsum, and mudstones of the Tamarisk. The Magenta has been tested in 18 cased and open boreholes at and around the WIPP site. Transmissivities within the WIPP site range from 2.1×10^{-3} to 3.8×10^{-1} ft^2/day (2.0×10^{-4} to 3.5×10^{-2} m^2/day) (SAND89-0869; SAND98-0049).

The water quality data for the Magenta indicate the water is saline to brine, with TDS values ranging from 5,460 to 270,000 mg/L. The predominant dissolved species are sodium, calcium, magnesium, chloride, and sulfate.

Dewey Lake Redbeds Formation

The Dewey Lake at the WIPP site is approximately 500 ft (152 m) thick and consists of alternating thin beds of siltstone and fine-grained sandstone. The upper Dewey Lake consists of a thick, generally unsaturated section. The middle Dewey Lake is the interval immediately above a cementation change, from carbonate (above) to sulfate (below), where saturated conditions and a natural water table have been identified in limited areas. The average saturated thickness is 16.6 ft (5.1 m). The lower Dewey Lake is below the sulfate cementation change, with much lower permeability.

The WIPP Groundwater Level Monitoring Program well WQSP-6A, approximately 1 mi (1.6 km) southwest of the center of the WIPP site, intersects water in the middle portion of the Dewey Lake. The Dewey Lake in general does not yield a sufficient domestic water supply; both in quality and volume. However, about 1.75 mi (2.8 km) south of WQSP-6A domestic and stock supply wells produce water from the middle Dewey Lake at Mills [formerly James] Ranch (*Geohydrology of Project Gnome Site* [Cooper and Glanzman, 1971]).

Santa Rosa Formation

The Triassic Santa Rosa consists of sandstones, siltstones, and conglomerates. It is absent over the western portion of the WIPP site. It dips and thickens from the center of the site to the east, increasing from 2 ft (0.6 m) thick at the air intake shaft to 255 ft (78 m) in potash holes 1 mi (1.6 km) east of the WIPP site boundary.

Water in the Santa Rosa has been found in the center part of the WIPP site only since the mid-1990s. In as much as no water was found in this zone during the mapping of the shafts in the 1980s, this water is deemed to be caused by man (see Section 3.3.1.3, Shallow Subsurface Water).

Gatuña Formation

Overlying the Santa Rosa, the Gatuña Formation (Gatuña) is a sandstone that typically increases in thickness towards the west of the WIPP site. The Gatuña unconformably overlies the Santa Rosa at the WIPP site, ranging in thickness from approximately 20 to 30 ft (6 to 9 m). The Gatuña consists of silt, sand, and clay, with deposits formed in localized depressions during the Pleistocene period. The Gatuña is water bearing in some areas, with saturation occurring in discontinuous perched zones. However, because of its erratic distribution, the Gatuña has no known continuous saturation zone. Drilling at the WIPP site, including 30 exploration borings drilled between 1978 and 1979, did not identify saturated zones in the Gatuña (Daniel B. Stephens & Associates, 2003).

3.2.1.2 Seismicity

The FEIS (DOE/EIS-026) defines the WIPP site as an area of low seismicity. Section 7.3.1 of the FEIS contains a detailed description of historical seismicity. The strongest earthquake on record within 80 mi (290 km) of the site was the Valentine, Texas, earthquake of August 16, 1931 (Doser 1987), with an estimated magnitude of 6.4. Seismic activity within 186 mi (300 km) of the WIPP site is currently monitored by seismographs installed and operated by the New Mexico Institute of Mining and Technology. Based on four quarterly reports for 2016 and reports from other seismic networks in the region, the largest was a 3.6 magnitude event located 83 mi (140 km) south of the WIPP site. The closest seismic event recorded had a magnitude of −1.7 and was located about 17 mi (27 km) north-northeast of the WIPP site. The events had no observable effect on WIPP facility structures (New Mexico Institute of Mining and Technology, 2016).

3.2.1.3 Soils

The Mescalero caliche, Berino soil, and surficial sands overlie the Gatuña. The Mescalero is an informal soil stratigraphic unit defined in *Geologic Processes and Cenozoic History Related to Salt Dissolution in Southeast New Mexico* (Bachman, 1974). It is widespread in southeastern New Mexico, and is a continuous stratigraphic unit at the WIPP site. The Mescalero near the WIPP site is about 5 ft (1.5 m) thick and about 5 to 10 ft (1.5 to 3 m) below ground surface (BGS). Overlying the Mescalero is the Berino soil overlain by surficial sands. The Berino soil is not a geologic unit, it is pedogenic. The surface sand across much of the WIPP site is aeolian, generally fine to medium grained and well sorted. Sand dunes in the vicinity of the WIPP area are generally stabilized by vegetation (*Basic Data Report for Drillhole C-2737,* DOE/WIPP-01-3210). Table 7-13 of the FEIS (DOE/EIS-026) provides details regarding the engineering suitability of Berino soil at the WIPP site.

A recent geotechnical investigation was performed at WIPP for a proposed filter building due east of the proposed above ground storage facility location. Several geotechnical tests were performed and the general conclusion was there are no soil constraints (e.g., expansive soils) that would preclude the development of the new filter building. The report did recommend the removal of surficial dune sand and soils to the Mescalero Caliche to support foundations (Golder Associates, 2016). The same assumptions would be applied to the above ground storage facility location.

3.2.2 Environmental Consequences

3.2.2.1 Alternative 1

Geological behavior, as well as key factors for performance of the repository, has been studied at the WIPP site and the proposed project area for over 30 years. Based on the results of site investigation summarized in numerous publications, including the WIPP *Geological Characterization Report* (SAND78-1596); the *WIPP Design Validation Final Report* (DOE/WIPP-86-010); and *Summary of Site-Characterization Studies Conducted from 1983 through 1987 at the Waste Isolation Pilot Plant (WIPP) Site Southeastern New Mexico* (SAND88-0157), no substantive changes have occurred in the understanding of the site and regional geology over this time period. The geological system, including seismicity, has been stable throughout this timeframe. There are not any active faults (less than 150 years) in the area of the WIPP site for hundreds of kilometers (United States Geologic Society Interactive Fault Map).

Alternative 1 is a surface-based facility that does not require the modification of the geology. Soils will be removed where necessary to make room for properly engineered base material for the concrete pad and associated drainage and pond features. Removal of topsoil will not be significant and top soil will be stored for eventual reclamation activities as is the practice at the WIPP facility. Therefore, impacts to geology and soils from implementation of Alternative 1 would be negligible.

3.2.2.2 Alternative 2

The analysis presented above under Alternative 1 is applicable to Alternative 2; because the differences in construction and operation methodologies (e.g., ground disturbing activities) would not lead to any greater impact to geology and soils; therefore, impacts to geology and soils from implementation of Alternative 2 would be negligible.

3.2.2.3 No Action Alternative

Under the No Action Alternative, the proposed action would not be implemented. Consequently, the existing conditions (as described in Section 3.2.1, Existing Environment) would remain unchanged. Therefore, no impacts to geology and soils would occur under the No Action Alternative.

3.3 Hydrology/Water Quality

3.3.1 Existing Environment

3.3.1.1 Surface Water

No surface water occurs in the area of the WIPP site and proposed project area, but surface water bodies lie within a 25-mile (40-km) radius of the center of the site, such as the Pecos River, Laguna Grande de la Sal, and livestock ponds (termed “tanks”), which are fed from surface runoff, and are sampled as part of the *Waste Isolation Pilot Plant Environmental Monitoring Plan* (DOE/WIPP-96-2194).

The nearest substantial surface water body, Laguna Grande de la Sal, is 8 miles (13 km) west-southwest of the center of the WIPP site in Nash Draw where shallow brine ponds occur. The Pecos River is located about 12 miles (20 km) west of the WIPP site. The livestock tanks are not hydrologically connected to the formations overlying the WIPP repository.

In the vicinity of the WIPP site, there are limited occurrences of potable water, and several water-bearing zones that produce poor-quality water. In the immediate vicinity of the WIPP site, groundwater is commonly of such poor quality that it is not usable for most purposes (*Groundwater Protection Program Plan,* DOE/WIPP-06-3339).

3.3.1.2 Groundwater

Several water-bearing zones have been identified and extensively studied at and near the WIPP site. Limited amounts of potable water are found in the middle Dewey Lake and the overlying Santa Rosa and Gatuña in the southern part of the WIPP LWA. Two water-bearing units, the Culebra and the Magenta, occur in the Rustler and produce brackish to saline water at and near the WIPP site. Another very low transmissivity, saline water-bearing zone occurs at the Rustler and Salado contact. More detail regarding groundwater at the WIPP site can be found in Section 3.2.1.1.

A Groundwater Detection Monitoring Program is required by the WIPP Hazardous Waste Facility Permit. In 2015, groundwater samples were collected and analyzed from six detection monitoring wells in the Culebra on the WIPP site. Concentrations of the indicator parameters, including those of the major cations, were all below the concentrations from the baseline studies with some exceptions for total suspended solids. Volatile organic compounds, semi-volatile organic compounds, and metals were less than background values stated in the WIPP Permit. The concentrations of the uranium isotopes measured in 2015 did not vary substantially from the concentrations measured in the same wells in 2014 (*Waste Isolation Pilot Plant Annual Site Environmental Report for 2015*, DOE/WIPP-16-3572). Two water-bearing zones exist beneath the WIPP site above the repository horizon. The Culebra is the most transmissive and occurs 675 ft (206 m) BGS in the area. The Magenta is less transmissive and occurs 571 ft (174 m) BGS (*Basic Data Report for Drillhole C-2737,* DOE/WIPP-01-3210).

3.3.1.3 Shallow Subsurface Water

Beginning in 1995, water was observed leaking into the Exhaust Shaft between 50 and 80 ft (15 and 24 m) BGS. Studies indicate that the water leaking into the shaft is from an unconfined, perched water table at the base of the Santa Rosa. This water is believed to come from anthropogenic causes, specifically from infiltration of rainfall that collected in surface impoundments on the WIPP site, such as the north salt storage catchment basin and the storm water runoff catchment basins to the south of the site (Daniel B. Stephens and Associates, 2003).

The SSW occurs beneath the WIPP site at depths less than 100 ft (30 m) BGS at the contact between the Santa Rosa and the Dewey Lake. This SSW yields generally less than 1 gallon per minute (4 liters per minute) in monitoring wells and piezometers and contains high TDS and chloride. The SSW occurs not only under the WIPP site surface facilities but also to the south as indicated by an encounter in borehole C-2737 about 0.5 mi (880 m) south of the Waste Shaft (*Basic Data Report for Drillhole C-2811,* DOE/WIPP-02-3223). A study of results of three piezometers drilled around the Site and Preliminary Design Validation salt pile (*Basic Data Report for Piezometers PZ-13, PZ-14, and PZ-15,* DOE/WIPP-08-3375) indicated SSW to be present to the east of the surface facilities.

The saturated zone is both vertically and laterally distinct from the water in the middle of the Dewey Lake at WQSP-6A, located about one mile to the southwest. Sample results at WQSP-6A have not indicated the existence of a hydraulic connection between the SSW located in the Santa Rosa and natural groundwater that occurs in the middle part of the Dewey Lake at the southern portion of the WIPP site and further south.

3.3.2 Environmental Consequences

3.3.2.1 Alternative 1

Hydrology/water quality has been studied at the WIPP site for over 30 years. Surface water bodies are not impacted by activities at the WIPP site. Water-bearing formations (Culebra, Magenta) are deep and separated from the surface by several hundred feet of low-permeability geologic formations (aquitards), limiting or preventing infiltration. Recharge to the Culebra is north and northwest of Nash Draw. Discharge from the Culebra is south of Laguna de la Sal near Malaga Bend. Recharge for the Magenta is north of the WIPP site near Bear Grass Draw and in Clayton Basin (*Geohydrology of the Proposed Waste Isolation Pilot Plant Site*, Mercer, 1983). More importantly, vertical infiltration into these water-bearing zones does not exist at the WIPP site.

The rate of evapotranspiration exceeds normal precipitation by about a factor of four. This means that precipitation does not infiltrate deeply into the soil except in areas where there are sand dunes. Infiltration generally does not go beyond the Mescalero Caliche. Precipitation that falls on the concrete pad will be collected and channeled to a lined evaporation pond to prevent infiltration and to provide an opportunity to sample the water to assure there has been no release or spill of radioactive waste. Based on the containment of runoff that falls on the concrete pad, the lack of surface water and depth of water-bearing formations, separated by low-permeability formations resulting in the lack of vertical infiltration, and distant recharge and discharge locations, implementation of Alternative 1 would have a negligible impact to hydrology/water quality.

3.3.2.2 Alternative 2

The analysis presented above under Alternative 1 is applicable to Alternative 2 because the differences in construction and operation methodologies (e.g., ground disturbing activities) would not lead to any greater impact to hydrology and water quality. Therefore, based on the lack of surface water and the depth of water-bearing formations, separated by low-permeability formations resulting in the lack of vertical infiltration, and distant recharge and discharge locations, impacts to hydrology and water quality from implementation of Alternative 2 would be negligible.

3.3.2.3 No Action Alternative

Under the No Action Alternative, the proposed action would not be implemented. Consequently, the current conditions would remain unchanged. Therefore, no impacts to hydrology/water quality would occur under the No Action Alternative.

3.4 Air Quality

3.4.1 Existing Environment

The SEIS-II documented that the U.S. Environmental Protection Agency (EPA) has classified Eddy County, New Mexico, where the WIPP facility is located, as an attainment area for all six of the criteria pollutants under the National Ambient Air Quality Standards (NAAQS). The WIPP facility is also in a Class II Prevention of Significant Deterioration area as defined in Section 160-169 of the Clean Air Act (CAA), and any new sources of emissions would have to adhere to the standards for such an area. The CAA allows for three air quality classes related to ambient air quality: Class I allows very little deterioration of air quality; Class II allows moderate deterioration; and Class III allow more deterioration; but in all cases, the pollution concentrations shall not violate any of the NAAQS. The Class I Prevention of Significant Deterioration areas nearest to the WIPP facility are Carlsbad Caverns National Park, which is 38 miles (61 km) southwest of the WIPP site, and Guadalupe Mountains National Park, which is 62 miles (100 km) southwest of the WIPP site (SEIS-II, pg. 4-6).

As discussed in the SEIS-II, the regional climate is semiarid, with low precipitation and humidity and a high rate of evaporation. Precipitation is unevenly distributed throughout the year, with most occurring during summer thunderstorms. Winds are mostly from the southeast, and moderate. In late winter and spring, there are strong west winds and dust storms. Thunderstorms are frequent from June through September, and are often accompanied by hail. Rains are brief but occasionally intense, and can result in flash flooding in arroyos and along floodplains. Tornadoes can occur throughout the region.

Based on the U.S. Climate Resilience Toolkit, expected climate changes include increased heat, drought, and insect outbreaks, all linked to climate change and increased wildfires. Declining water supplies, reduced agricultural yields, health impacts in cities due to heat, and flooding and erosion are additional concerns. Such changes are not anticipated to impact the potential environmental impacts of WIPP, as described in *Supplement Analysis for the Waste Isolation Pilot Plant Site-Wide Operations* (DOE/EIS-0026-SA-10).

3.4.2 Environmental Consequences

The area of the proposed action is within the Pecos River airshed and is classified as a Class II Air Quality Area (CAA Sections 160-169). A Class II area allows moderate amounts of air quality degradation. The primary causes of air pollution in the project area are from motorized equipment and dust storms caused by strong winds during the spring. Particulates from nearby oil and gas production, agricultural burning, recreational and industrial vehicular traffic, and ambient dust can also affect air quality. Air quality in the area near the proposed action is generally considered good, and the proposed action is not located in any of the areas designated by the EPA as “non-attainment areas” for any listed pollutants regulated by the Clean Air Act (*Environmental Assessment for the Reconstruction of the South Access Road in Support of the Department of Energy,* DOI-BLM-NM-P020-2010-00114-EA).

3.4.2.1 Alternative 1

The construction and operations emissions that would be generated under Alternative 1 are described in this section.

Estimates of particulate emission from dirt work of excavation and compaction, importing Type 2 aggregate base, fire line excavation and backfill, electrical line excavation and backfill, and excavation of the storm water pond are shown in Table 3-1.

TABLE 3-1. PARTICULATE EMISSIONS FROM CONSTRUCTION ACTIVITIES

Particle Size (total suspended particulates)	lbs/day	lbs/project	tons/project
(<30 um)	248	11,264	5.6
<=30 um >15 um	194	8,850	4.4
<=15 um >10 um	13	603	0.3
<=10 um > 2.5 um	14	628	0.3
<= 2.5 um	26	1,183	0.6

Note: Emission rates are from AP-42 Table 11.9-1.

Emissions from the construction of the project under Alternative 1 would have a negligible impact on the total emissions from operations of the WIPP facility. Emissions from the construction of the project would not have substantial impact on the ambient air quality. In addition, project-related operations emissions would be negligible.

The DOE requires that projects quantify a proposed action's projected direct and indirect greenhouse gas (GHG) emissions, and use these emissions as a proxy for assessing potential climate change effects. The WIPP comprehensive GHG inventory reported emitting 11,101 metric tons of CO^2 equivalent in FY 2014 and approximately 8,933 metric tons of CO^2 equivalents for FY 2015 (*Waste Isolation Pilot Plant Annual Site Environmental Report for 2015,* DOE/WIPP-16-3572).

In accordance with *Strengthening Federal Environmental, Energy, and Transportation Management*, EO 13423, and *Federal Leadership in Environmental, Energy, and Economic Performance*, EO 13514, DOE has made reduction of GHG emissions a priority. DOE's *2015 Strategic Sustainability Performance Plan* commits the agency to reduce emissions by 25 percent from a Fiscal Year 2008 baseline in 2015 and by 50 percent by Fiscal Year 2025. The WIPP comprehensive GHG inventory reveals that the largest contributors to the WIPP GHG footprint are electricity use, business travel, and employee commute to the WIPP site (*Waste Isolation Pilot Plant Annual Site Environmental Report for 2015*, DOE/WIPP-15-8866). Fuel contributions represent the smallest contributor to CO^2. See the *Supplement Analysis for the Waste Isolation Pilot Plant Site-Wide Operations*, DOE/EIS-0026-SA-10; however, a temporary increase of CO^2 from construction activities is expected from the construction of the AGSC project. Based upon the WIPP facility GHG profile referenced above, this temporary increase would be negligible.

3.4.2.2 Alternative 2

The analysis presented above under Alternative 1 would be applicable to Alternative 2 because the differences in construction and operation methodologies would not lead to any greater impact to air quality. The analysis presented above under Alternative 1 would be applicable to Alternative 2 with one exception. The Sprung® structure would require additional electricity use for internal structure lighting as well as continuous ventilation system support; therefore, project-related operations emissions would increase for Alternative 2 compared to Alternative 1.

The analysis presented above under Alternative 1 would be applicable to Alternative 2 because the differences in construction and operation methodologies would not lead to any greater impact to air quality. However, the Sprung® structure lighting and continuous ventilation system support would require an insignificant increase in electrical power compared to Alternative 1. The operational emissions associated with this increase in electrical power would be negligible. Therefore, impacts to air quality from implementation of Alternative 2 would be negligible.

3.4.2.3 No Action Alternative

Under the No Action Alternative, the proposed action would not be implemented. Consequently, the existing conditions would remain unchanged. Therefore, no impacts to air quality would occur under the No Action Alternative.

3.5 Cultural Resources

3.5.1 Existing Environment

The WLWA is situated in dune-covered, rolling-plains terrain in the eastern part of the Bureau of Land Management's (BLM's) Carlsbad Resource Area. Known archaeological sites within the area are primarily the remains of prehistoric camps and short-term settlements. These localities are generally marked by hearth features, scattered burned rock, flaked stone projectile points, cutting and scraping tools, pottery fragments, and ground stone implements. Locations generally represent short-term, seasonal occupations by small, nomadic groups of hunters and gatherers who used the plants and animals in the dune lands east of the Pecos River. In a few cases within the WLWA, sites with evidence of structures have been reported. These sites probably hosted occupations of perhaps several weeks or months (*Waste Isolation Pilot Plant Land Management Plan,* DOE/WIPP-93-004). The following is a summary of archeological work performed at the site.

In 1976, the Agency for Conservation Archaeology (ACA) from Eastern New Mexico University conducted an archaeological survey of the core area within the WLWA (Sections 20, 21, 28, and 29) and various other locations around the WIPP facility including rights-of-way and well pads. Additional rights-of-way and well pads were inventoried in 1978 and 1979 by ACA. The ACA surveys included various north/south corridors in the areas south of the WIPP site including the northeast corner of Section 29 which include the project area. None of these corridors indicated any archaeological sites within or near the corridors, except in areas farther south than the project area. In 1987, Mariah Associates conducted an intensive study of portions of 45 sections surrounding the WIPP site. Mariah's study included an inventory of 2,460 acres in 15 quarter-section units. Inventoried units were selected to be representative of the area as a whole. Within each of the sample units, cultural resource sites encountered were recorded, certain selected sites were tested, and management recommendations were prepared (Mariah Associates, 1987).

Of a total of 10,240 acres (4,144 hectares) in the WLWA, 3,380 acres (1,368 hectares) (37 percent) have been inventoried for cultural resources. The results indicate one site for every 65 acres (26 hectares) surveyed, and one isolate in every 42 acres (17 hectares). Based on this information, and assuming environmental homogeneity and a fairly even distribution of sites, the remaining 6,410 un-inventoried acres (2,594 hectares) could contain approximately 99 sites and 153 isolates. The combined results of the surveys conducted within the WLWA compare well with those from Mariah's 1987 inventory of selected units over a much larger area. Mariah's results show only a slightly higher frequency of cultural resources per acre. In the 2,460 acres (996 hectares) surveyed by Mariah, 40 sites and 75 isolates were recorded, or one site for every 62 acres (25 hectares) and one isolate in every 33 acres (13 hectares) (DOE/WIPP-93-004).

Based on the results of the Mariah inventory, there is a high likelihood that archaeological sites exist within the project area. In 1997, the DOE officially entered into a Joint Powers Agreement with agencies from the State of New Mexico (DOE, 1997) including the SHPO who coordinates state participation in implementing the National Historic Preservation Act (NHPA). Commitments by both agencies are established in the agreement with regard to notification time lines. In addition, the agreement reiterates the DOE obligation to manage cultural resources in accordance with Sections 106 and 110 of the NHPA, the Archaeological Resource Protection Act, Native American Graves Protection and Repatriation Act, and applicable DOE orders. Accordingly, the DOE evaluates construction activities in previously undisturbed areas for potential impacts to cultural resources as required by the Land Management Plan (DOE/WIPP-93-004). New surface-disturbing activities are evaluated by a licensed archaeologist and, if necessary, concurrence is obtained from the SHPO prior to allowing the action to proceed. In the event that any archaeological sites or isolated manifestations are uncovered during construction, work would cease to allow the sites to be studied (*Archaeological Clearance Report for Sandia Laboratories* [Schermer, 1978]).

3.5.2 Environmental Consequences

3.5.2.1 Alternative 1

Of the 40 sites identified and evaluated on the Mariah inventory, 14 appear to be eligible for the National Register of Historic Places, 24 are potentially eligible, and 2 are not eligible. None of the 75 isolates are considered eligible. While the data from the various researchers cited above are not always consistent with Mariah's explicit data on-site significance, it appears that within the WLWA, the majority of sites either are or have the potential to be eligible for the National Register of Historic Places and will require consideration in future land disturbing activities (DOE/WIPP-93-004).

In August 1978, the Agency for Conservation Archaeology from Eastern New Mexico University conducted an archaeological survey of the area around the WIPP facility. The Agency for Conservation Archaeology surveyed various north/south corridors in the areas south of the WIPP site. None of these corridors indicated any archaeological sites within or near the corridors except in areas farther south than the project area. Therefore, impacts to cultural resources from implementation of Alternative 1 would be negligible.

3.5.2.2 Alternative 2

The analysis presented under Alternative 1 applies to Alternative 2 because the differences in construction and operation methodologies (e.g., ground disturbing activities) would not lead to any greater impact to cultural resources. Therefore, impacts to cultural resources from implementation of Alternative 2 would be negligible.

3.5.2.3 No Action Alternative

Under the No Action Alternative, the proposed action would not be implemented. Consequently, baseline conditions would remain unchanged. Therefore, no impacts to cultural resources would occur under the No Action Alternative.

3.6 Hazardous Materials and Hazardous Wastes

3.6.1 Existing Environment

The WIPP facility/proposed project area has a NMED Discharge Permit for a wastewater lagoon facility. The daily discharge limit to the lagoon is 23,000 gallons (87,000 L) per day of domestic wastewater, 2,000 gallons (7,570 L) per day of miscellaneous non-hazardous water, and 8,000 gallons (30,283 L) per day of miscellaneous non-hazardous brine and water. The DOE currently does not require a National Pollutant Discharge Elimination System permit for the WIPP. There is no point source discharge to waters in the United States. A National Pollutant Discharge Elimination System storm water permit would be needed for construction activities on sites larger than 5 acres (2 hectares).

During operations at the WIPP facility, Resource Conservation and Recovery Act hazardous wastes are generated. These wastes typically included absorbed liquids from spills and routine usage of maintenance products, including oils, coolants, and solvents. Safe storage of these materials and their associated hazards are administered in compliance with the Site Generated Non-Radioactive Hazardous Waste Management Program, the Industrial Safety Program, and the WIPP Emergency Management Program. A Hazardous Waste/Material Storage Facility is provided for storage of various types of incoming and outgoing hazardous materials prior to use or shipment to a Treatment, Storage, and Disposal Facility (*Waste Isolation Pilot Plant Documented Safety Analysis*, DOE/WIPP-07-3372).

Consideration of hazardous materials and hazardous waste at the WIPP facility, for the purposes of NEPA, also considers the generation of radioactive waste. When used as a fire suppressant, water is the largest potential source of liquid radioactive waste. Another source would be liquid used for decontamination. In an unlikely fire event, suspect liquids would be sampled and tested for radioactivity. If the liquid exceeds the uncontrolled release limit imposed by *Radiation Protection of the Public and the Environment,* DOE Order 458.1, and the radioactivity is derived from offsite waste containing transuranics, it is collected and made acceptable for disposal at the WIPP facility. Non-fire water radioactive waste is collected and handled in accordance with the procedure in *Site-Derived Mixed Waste Handling*, WP 05-WH1036.

The solid radioactive waste system provides for the collection and packaging of site-derived radioactive waste. It is anticipated that site-derived waste would be CH TRU mixed waste.

In addition to the processes and procedures identified above, the Nuclear Waste Partnership LLC has a standing procurement clause for subcontract work regarding environmental compliance in reference to construction projects. The standing clause states that the subcontractor and its lower-tier subcontractors and suppliers of any tier, including the employees and agents, shall comply with all health, safety, and environmental laws, statutes, ordinances, rules, regulations, permits, and orders regulating or dealing with a hazardous substance or hazardous waste that becomes applicable during the term of the contract. Also, the subcontractor shall obtain required permits, licenses, certificates, approvals, and other authorities required to conduct work and perform the services specified under the contract. The subcontractor is the responsible party for managing, treating, and disposing of any hazardous waste that is generated throughout the project.

3.6.2 Environmental Consequences

3.6.2.1 Alternative 1

Construction of an Overpack Unit would lead to new waste generation. These waste forms would range from the sanitary solid and liquid wastes that would be associated with any facility to the hazardous wastes that would be generated from the construction of the Overpack Unit. Sanitary wastes are generally disposed of via municipal sewers and treated at municipal waste treatment facilities. Construction contracts include clauses that require the contractor to manage and properly disposition any waste generated as the result of construction activities.

With regard to operation of an Overpack Unit, the generation of hazardous and radioactive waste would be minimal and would likely be associated with accidents or off-normal events. Storage and disposal of such waste under Alternative 1 at the WIPP facility would involve the same established processes, procedures, and equipment that are currently in use at the WIPP facility (as discussed above).Therefore, hazardous materials/hazardous wastes impacts from implementation of Alternative 1 would be negligible.

3.6.2.2 Alternative 2

The analysis presented above under Alternative 1 is applicable to Alternative 2; therefore, impacts of implementation of Alternative 2 would be negligible.

Operation of Alternative 2 will result in an additional waste stream that includes the HEPA filtration system filters. Based on operating experience in the WHB, these filters are replaced infrequently and do not represent a significant volume increase. Managing these filters is well within the current capability of the WIPP facility processes, procedures, equipment and personnel.

3.6.2.3 No Action Alternative

Under the No Action Alternative, DOE would not build the AGSC (i.e., the proposed action would not be implemented). The No Action Alternative would require no action for the WIPP site. Under the No Action Alternative, the management of hazardous waste is the same as the existing environment. No impacts would result from the No Action Alternative.

3.7 Nuclear and Operational Safety

3.7.1 Existing Environment

The *Waste Isolation Pilot Plant Above Ground Storage Capability (AGSC) Project Preliminary Documented Safety Analysis* (416-500655-BD-SE-00305) provides an assessment of hazards associated with normal, abnormal, and accident conditions involving handling and disposal operations with CH TRU mixed waste and RH TRU mixed waste in shielded containers. The assessment includes natural phenomena hazards (NPH) and man-made external events, including the identification of energy sources or processes that might contribute to the generation or uncontrolled release of radioactive and other hazardous materials. In addition, events that may be beyond the design basis of the WIPP facility are also assessed.

When converting radiological doses to potential latent cancer fatalities (LCFs), the SEIS-II (*Waste Isolation Pilot Plant Disposal Phase Final Supplemental Environmental Impact Statement*, DOE/EIS-0026-S-2), used a factor of 5×10^{-4} fatality per roentgen equivalent man (rem) for the public and a factor of 4×10^{-4} fatality per rem for workers. The value for workers was lower due to the absence of children and the elderly, who are considered more radiosensitive (*Final Programmatic Environmental Impact Statement for Accomplishing Expanded Civilian Nuclear Research and Development and Isotope Production Missions in the United States, Including the Fast Flux Test Facility*, DOE/EIS-0310). Since publication of the SEIS-II, DOE guidance (DOE, 2003) recommends the use of a conversion factor of 6×10^{-4} fatality per rem for both workers and members of the public. The DOE guidance recommends use of factors developed by the document *A Method for Estimating Radiation Risk from Total Effective Dose Equivalent (TEDE)* [Interagency Steering Committee on Radiation Standards, 2002].

Table 3-2 depicts worker dose information for normal operations for the years 2013 to 2015. The 2013 information represents worker doses for operations before the February 2014 incidents; the 2015 information represents worker doses associated with post-February 2014 activities. Data are presented for the average worker, the maximally exposed worker, and all workers (collective annual). As the data shows, average worker doses and maximally exposed worker doses at the WIPP facility are very small (less than 1 millirem (mrem)/yr). Collective annual worker doses are also small, at less than 1 person-rem/yr. Table 3-2 also presents the potential for a LCF using the dose conversion factor of 6×10^{-4} fatality per rem.

TABLE 3-2. WORKER DOSES AND IMPACTS

	2013		2014		2015	
	Dose	**LCF**	**Dose**	**LCF**	**Dose**	**LCF**
Average Worker	<1 mrem/yr	6×10^{-7}	<1 mrem/yr	6×10^{-7}	<1 mrem/yr	6×10^{-7}
MEI	<1 mrem/yr	6×10^{-7}	<34 mrem/yr	2×10^{-5}	<1 mrem/yr	6×10^{-7}
All Workers (annual)	0.564 person-rem/yr	3.4×10^{-4}	0.034 person-rem/yr	2×10^{-5}	0.161 person-rem/yr	9.7×10^{-5}

Source: DOE/WIPP-16-3572 with dose data documented the Radiation Exposure Monitoring System database, https://energy.gov/ehss/policy-guidance-reports/databases/occupational-radiation-exposure.

As with the pre-February 2014 disposal activities at the WIPP facility, potential worker exposures would achieve as-low-as-reasonably-achievable by four main factors: (1) using appropriate personal protective equipment; (2) minimizing times of exposure; (3) maintaining operations that would initially process and dispose of only CH TRU mixed waste; and (4) configuration of the U/G ventilation so that ventilation flow is always directed from the involved workers toward areas of potential contamination and then to the HEPA filtration system. Over time, the TRU waste disposal throughput would gradually increase to levels similar to those in 2013 and, as a result of the same as-low-as-reasonably-achievable principles identified above, it is expected that worker doses following resumption of activities would be less than or similar to 2013 levels (DOE/WIPP-16-3572).

DOE has estimated that the annual worker exposures projected after the resumption of TRU waste emplacement would be less than or similar to the doses measured in 2013 (DOE/WIPP-16-3572). Based on the data in Table 3-2, the annual impacts to all workers would be less than or equal to 3.4×10^{-4} LCF, which is within the bounds of the analysis presented in the SEIS-II.

The principal hazard analyzed for the WIPP facility/proposed project site is the potential for the release of radiological material associated with TRU mixed waste resulting from fires, deflagrations/over-pressurizations, and loss of confinement events due to in-process activities, external initiation, or NPH initiated events. The hazard and accident analyses are performed using the methodology outlined in DOE-STD-5506-2007 for compliance with DOE-STD-3009-2014, and approved by the DOE Carlsbad Field Office for application at the WIPP site.

The principal operations at the WIPP facility involve the receipt and disposal of TRU waste and TRU mixed waste. WIPP CH TRU mixed waste operations considered in the *Waste Isolation Pilot Plant Documented Safety Analysis (DSA),* DOE/WIPP-07-3372, include the following:

- The process for receipt, movement, and emplacement of CH TRU mixed waste containers with battery-powered and diesel-fueled forklifts, electric-powered Automated Guided Vehicles, cranes, and the Waste Hoist is depicted in Figure 3-2. (Note: underground operations are not depicted in Figure 3-2 because they would not be impacted by the Proposed Action and Alternatives). The following steps are included in this process:

  – The transportation carrier, after entering the WIPP PPA, parks a trailer with loaded shipping packages adjacent to the WHB within the PAU hazardous waste storage unit.

  – A trailer jockey is used to move the loaded trailer, with its accompanying shipping packages, adjacent to an airlock, in preparation for transit of the loaded shipping packages into the WHB CH Bay.

  – A forklift is used to transfer the loaded shipping packages from the trailer through the airlock to a TRUDOCK unloading station within the WHB.

  – An overhead crane is used to remove the shipping package lids and place them onto support stands; then the crane operator proceeds to remove the waste containers from the shipping packages and place them onto facility pallets.

The DOE uses the DSA process to describe and analyze the hazards and risks associated with the WIPP facility waste handling and disposal operations. In the DSA, the DOE identifies the hazard controls necessary to protect the worker, the public, and the environment. Regarding the condition of the existing environment, the safety basis demonstrates that the DOE employs the necessary controls to provide an acceptable level of safety compliant with 10 CFR 830, Subpart B.

The existing requirements do not allow for prolonged storage of TRU waste and TRU mixed waste above ground at the WIPP facility. The Permit and NEPA documentation require the receipt and disposal of TRU waste shipments with no storage at the surface beyond the timeframe allowed for storage in the NRC Type B shipping containers certificate of compliance (up to 60 days once the inner containment vessel is sealed) and the administrative limits in the Permit for the WIPP WHB and the PAU.

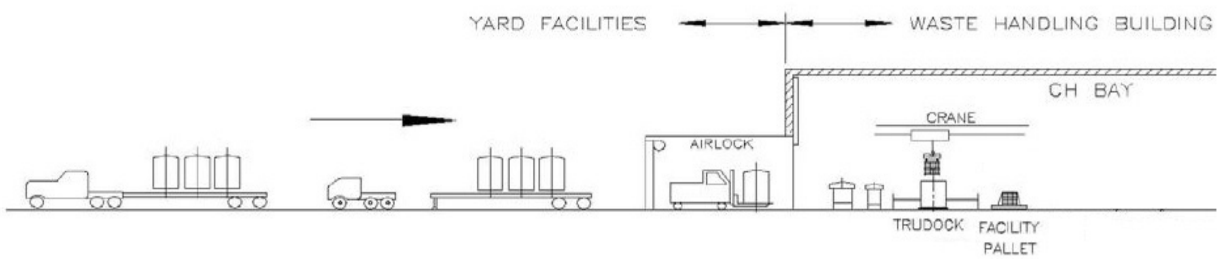

FIGURE 3-2. GENERAL WASTE HANDLING PROCESS FOR CH TRU MIXED WASTE OPERATIONS

3.7.2 Environmental Consequences

3.7.2.1 Alternative 1

Because of the change to the facility footprint, the proposed AGSC project has been evaluated to meet the requirements for definition as a major DSA modification as described in *Integration of Safety into the Design Process*, DOE-STD-1189-2016. The facility footprint change of interest for Alternative 1 is the addition of an Overpack Unit, which would extend the facility footprint to the south of the existing PPA boundary; however, this would not represent an increase in the overall WIPP facility TRU waste inventory since the surface storage would be temporary and waste that would ever be in the Overpack Unit would already be included in the total WIPP TRU waste inventory. It would, however, be an increase in the amount of waste at the WIPP facility on the surface at any one time, and the footprint change would reduce the minimum distance to the maximally-exposed offsite individual (MOI) from approximately 1.9 mi (3.1 km) to about 1.6 mi (2.5 km).

Therefore, the hazard that must be analyzed for Alternative 1 is the potential for the release of radiological material associated with TRU mixed waste resulting from fires, deflagrations/over-pressurizations, and loss of confinement events due to in-process activities, external initiation, or NPH initiated events during transport and storage of waste outside of the WHB. The analyses of events outside the WHB must also consider the potential impact of reduced distance to the MOI.

The primary project feature, which addresses facility safety for Alternative 1, is the use of concrete overpack containers which provide secondary containment for the waste containers and would temporarily reside in the Overpack Unit. The waste containers within each concrete overpack would ultimately be disposed of in the WIPP facility U/G in accordance with established standard operating procedures. The concrete overpack design minimizes the migration of hazardous waste to the environment in the event of a breach of the primary containment. The closed concrete overpack containers would be sufficiently permeable to maintain hydrogen concentrations below the lower flammability limit, and are of robust design such that waste containers are protected from rain.

A closed AGSC concrete overpack provides a thermal barrier to protect stored waste packages from credible external fires. This also prevents fires inside an overpack from propagating beyond the AGSC concrete overpack of interest. The concrete overpack containers would be designed to provide a two-hour barrier for fire events,

The likelihood and severity of fires affecting concrete overpack containers would be minimized through design features and operational restrictions. Concrete overpack containers would be manufactured with pockets for forklift tines, eliminating the need for pallets on the AGSC overpack storage pad. Existing WIPP facility fire protection program requirements minimize the presence of other combustibles on the pad and ensure a minimum 20-ft (6-m) cleared space around the stored material to protect from wildfires. The WIPP facility fire water supply system would be extended to the AGSC overpack storage pad and a new fire hydrant adjacent to the pad would be installed during construction.

The operations, which would be enabled by the AGSC project, for Alternative 1 are similar to those mentioned in Section 3.7.1, Existing Environment, except instead of placing the waste containers on facility pallets and emplacing them in the U/G, the waste container would be placed into concrete overpack containers within the WHB and then moved onto the Overpack Unit south of the existing WHB. These additional operations are listed below and shown in Figure 3-3:

- The transport of empty concrete overpack containers into the WHB to the TRUPACT-II TRUDOCK.
- Loading/closing of concrete overpack containers with CH TRU mixed waste (including RH TRU mixed waste in shielded containers) at the TRUDOCK.
- Movement of the loaded and closed concrete overpack out of the WHB using an all-terrain forklift of loaded concrete overpack containers to their storage locations in the Overpack Unit.
- Storage of the concrete overpack in the Overpack Unit.
- Transport of the loaded concrete overpack to outside the WHB from the Overpack Unit.
- Transport of the loaded concrete overpack from outside the WHB to the TRUDOCK.
- Unloading the contents of the loaded concrete overpack to a facility pallet.
- Removal of the empty concrete overpack from the WHB to a staging/storage location.

Regarding these operations:

- Operations involving empty/clean concrete overpack containers are Standard Industrial Hazard events and do not have to be further considered in the DSA.

- Operations inside the WHB are similar to operations already analyzed involving Type B packages and facility pallets and do not have to be considered.

- Since, previously, transportation of TRU waste outside the WHB was performed in NRC certified Type B packages, transportation events outside the WHB involving concrete overpack containers must be analyzed.

- Since, previously, TRU waste storage outside the WHB was performed in NRC certified Type B packages, events involving CH TRU mixed waste storage outside the WHB in concrete overpack containers must be analyzed.

The following safety class design feature is proposing to reduce the risk to the MOI, co-located worker, and/or facility worker:

- **Concrete Overpack**. The concrete overpack is of robust design with 8-in. (20-cm) reinforced concrete walls/lid and with a 6-in. (15-cm) concrete base to protect its contents from mechanical damage and NPH events including tornado hazards, has a large mass and diameter to resist sliding and overturning in seismic and NPH events, provides a minimum two-hour fire barrier to protect its contents from exterior fires and prevent internal fires from spreading outside the overpack, and permits venting of hydrogen through concrete permeation to prevent flammable concentrations.

The following administrative control is modified to reduce the risk to the MOI, co-located worker, and/or facility worker:

- **TRU Waste Outside the WHB**. The TRU waste outside the WHB control is modified to ensure that TRU waste containers are protected from adverse events (e.g., fires, explosions, impacts) when located above ground and outside the WHB. This control excludes site-derived TRU waste. This is accomplished by ensuring that TRU waste (excluding site-derived TRU waste), above ground and outside of the WHB, is contained in either a closed NRC certified Type B shipping package or a closed concrete overpack.

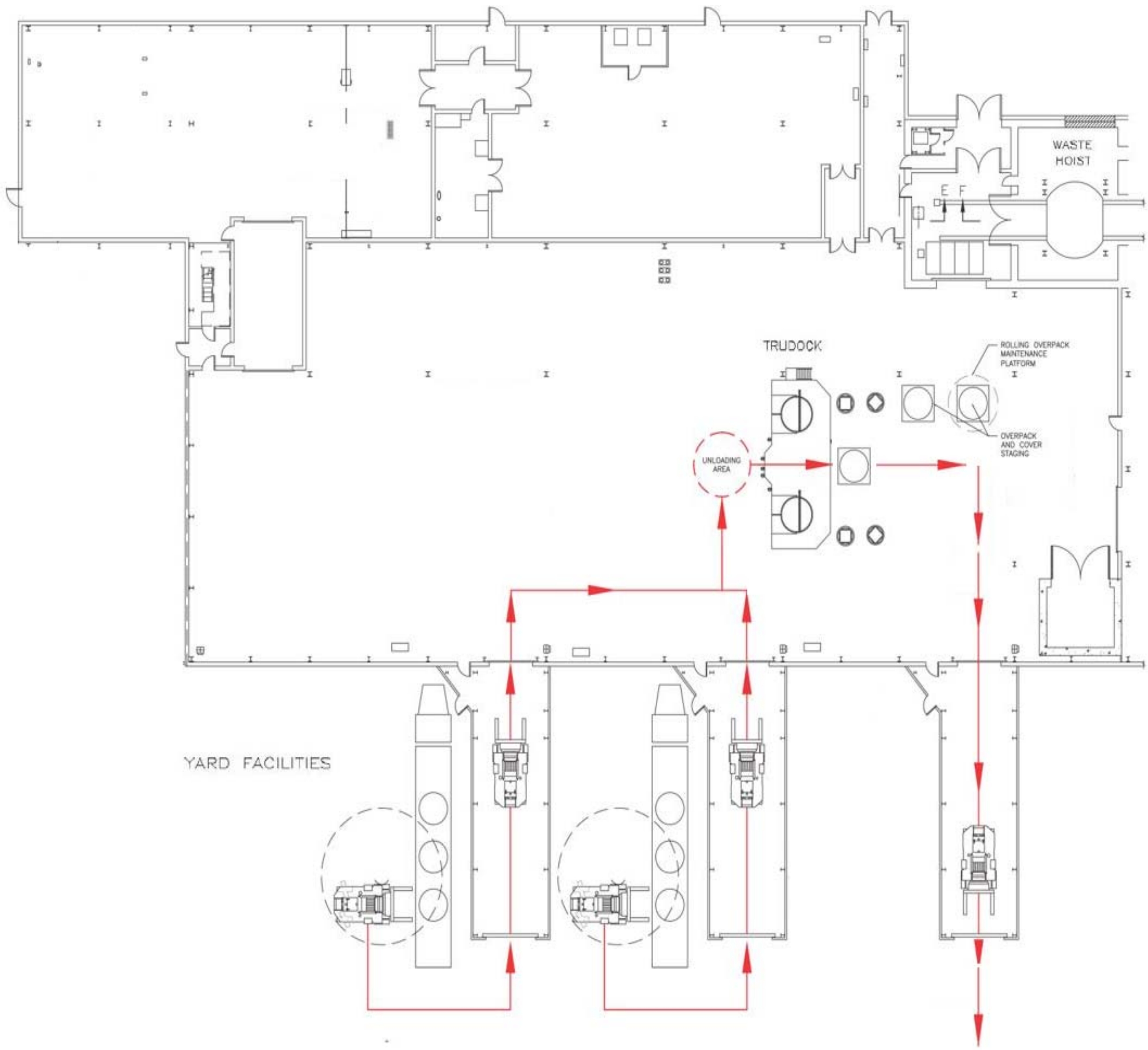

FIGURE 3-3. CH TRU MIXED WASTE TRANSPORT ROUTES IN THE WASTE HANDLING BUILDING (TOP VIEW) – ALTERNATIVE 1

The following administrative controls are proposed to reduce the risk to the MOI, co-located worker, and/or facility worker:

- **Payload lift height restriction**. Because the concrete overpack sits on the floor of the WHB during loading and unloading, the lift height for removing the payload from the TRUPACT II or HalfPACT is no different than the height required for putting the payload on a facility pallet, the existing DSA analysis is adequate.

- **Concrete overpack tipping potential**. The payload in a concrete overpack is not at a sufficient height in order to allow it to tip over by itself. If struck by another object, sufficient momentum could be applied to tip over the concrete overpack. The massive structure of the concrete overpack prevents it from being overturned with potential lid loss.

- **Spotter during loaded concrete overpack movements outside WHB**. Vehicles transporting loaded concrete overpack containers between the WHB and the overpack storage pad shall be attended to reduce the likelihood of collision events with potential for combustible liquid spills resulting in a liquid fuel pool fire involving TRU waste. Spotters observe for an unobstructed route for the transport vehicle and take action to prevent any other vehicles operating in the PAU from interacting with the transport of the concrete overpack.

The above controls reduce the risk to the MOI, the public, the co-located worker, and the facility worker to a level of minor or minimal concern from normal, abnormal, and accident conditions that could occur during WIPP operations, compliant with 10 CFR 830, Subpart B. Also, based on the conservative analysis results using atmospheric dispersion data from SEIS-II and an updated dose conversion factor from the 2016 *Supplement Analysis for the Waste Isolation Pilot Plant Site-Wide Operations* (DOE/EIS-0026-SA-10) for both radiological materials and hazardous chemicals for Alternative 1, no added or additional health effects would be anticipated from the operation of an Overpack Unit at the WIPP facility; therefore, impacts to nuclear safety from implementation of Alternative 1 would negligible.

Under Alternative 1, a new above ground hazardous waste storage unit would be constructed at the WIPP facility consisting of an Overpack Unit and concrete overpack containers. Although the WIPP facility infrastructure would be available to support the construction, construction workers would be needed to complete the project. Construction activities could result in occupational injuries and illnesses to construction workers. Approximately 50 construction workers would be employed for 18 months to build the Overpack Unit at the WIPP facility. Based on the latest available occupational injury and illness statistics under the Specialty Trade Contractor category from the Bureau of Labor Statistics (year 2015 data from Bureau of Labor Statistics, 2016), the expected total recordable cases could be 3.7, while approximately one lost workday case might be expected. Department of Energy and DOE contractor occupational injury statistics were not used because a private contractor was assumed to construct the facility. No other non-radiological or radiological impacts would occur to workers or members of the public during construction because no hazardous or radioactive materials would be present. Therefore, the facility construction impacts to implementation of Alternative 1 would be negligible.

3.7.2.2 Alternative 2

Nuclear and operational safety under Alternative 2 at WIPP would involve the same processes and procedures discussed above under Alternative 1. The difference in Alternative 2 compared to the existing environment and Alternative 1 is the location for loading and unloading of the

TRUPACT-II or HalfPACT. Alternative 2 is designed with an unloading station similar to the existing WHB configuration. This would allow unloading to occur either in the WHB, as depicted in Figure 3-3 shown in Section 3.7.2.1, Alternative 1, or inside the Alternative 2 facility. Alternative 2 is designed with features similar to the existing WHB (including filtered ventilation), and the processes for loading, unloading, and transporting hazardous waste would remain unchanged; therefore, impacts to nuclear and operational safety from implementation of Alternative 2 would be negligible. Alternative 2 does, however, present an increased risk of fire compared to Alternative 1 because of the potential combustible Sprung® structure covering material and the filter assembly units. WIPP's fire protection program addresses the risk associated with fire.

3.7.2.3 No Action Alternative

Under the No Action Alternative, DOE would not construct the AGSC (i.e., the proposed action would not be implemented). The existing condition (nuclear safety analysis) would remain unchanged, and the existing DSA process would continue to describe and analyze the WIPP site including waste handling and disposal operations. It has identified associated hazards and the conditions and hazard controls necessary to protect the worker, the public, and the environment. Under the No Action Alternative, the safety basis is the same as the existing environment, which demonstrates that WIPP employs the necessary controls to provide an acceptable level of safety compliant with 10 CFR 830, Subpart B. Therefore, impacts on nuclear and operational safety would not occur under the No Action Alternative.

3.8 Visual Resources

The Land Withdrawal Act (LWA) (Public Law 102-579) transferred responsibility for management of the WIPP withdrawal area from the Secretary of the Interior to the Secretary of Energy. The LWA establishes certain rights and responsibilities, one of which is the preparation of a Land Management Plan (LMP) which the DOE published in 1993 (DOE/WIPP-93-004). The WIPP LMP incorporates the restrictions of the LWA and a DOE Memorandum of Understanding with the BLM. The LMP establishes management objectives and planned actions for the use of the withdrawn land until the end of the decommissioning phase. The LMP lists 13 areas of concern: wildlife, cultural resources, grazing management, recreation, mining and oil and gas production, rights-of-way, access, emergency and facility security, fire management, water service, groundwater surveillance, salt tailings, and reclamation. Section 8.2.4 of the LMP addresses visual resource management.

The DOE implements the BLM manual *Visual Resource Management* (BLM, 1984) to determine the degree to which any proposed projects or other activities within the WLWA would affect the visual quality of the landscape. Using this system, any anticipated unacceptable visual impacts can be mitigated during the planning and design stage. The DOE aspires to conduct WIPP-related activities in accordance with visual resource objectives. Proposed activities and projects will be evaluated for consistency with existing laws and best management practices regarding scenic quality. The impacts of each action will be evaluated by DOE. The DOE will analyze the project significance, the visual sensitivity of the affected area, and the project impacts. Stipulations will be attached as appropriate to ensure compatibility of projects with management objectives for visual resources. Painting requirements will be implemented for surface facilities in accordance with existing guidelines (e.g., BLM painting requirements).

The 1996 SEIS-II, Section 4.1.1, commits DOE to determine the impacts that projects will have on the "visual quality of the landscape." Three measures are used by the BLM to determine the visual quality. Scenic quality is a measure of the visual appeal of a tract of land. Lands are rated based upon the apparent scenic quality which is determined using factors such as landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications. The location of the Overpack Unit rates low in each category indicating a low scenic quality rating. Sensitivity levels are a measure of public concern for scenic quality. Public lands are assigned sensitivity levels based upon type of users, amount of use, public interest, adjacent land use, special areas, and other factors specific to the location. Since the Overpack Unit would be located in an unpopulated area that can only be used for TRU waste management, the sensitivity level analysis for this location is low. Delineation of distance zones are based on the visibility of the location from population zones or public roadways.

3.8.1 Existing Environment

The location of the AGSC project is within a BLM Visual Resource Management Class IV zone. The objective of Visual Resource Management Class IV is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic landscape elements of color, form, line, and texture.

3.8.2 Environmental Consequences

3.8.2.1 Alternative 1

This project would cause some short-term and long-term visual impacts to the natural landscape. Short-term impacts would occur during construction operations. These include the presence of construction equipment vehicle traffic.

Long-term impacts would be visible to the casual observer through the life of the Overpack Unit. These include the visual evidence which would cause visible contrast to form, line, color, and texture. Removal of vegetation due to construction of the proposed project would expose bare soil lighter in color and smoother in texture than the surrounding vegetation.

After construction and removal of construction equipment the area should return to its current condition and the visual impacts of stored concrete overpack and fences, light standards, and other utilities would be minimized.

Short- and long-term impacts are minimized by best management practices such as color selection, reducing cut and fill, and screening facilities with natural features and vegetation. Due to its remote location, the Overpack Unit would not be visible to the public; therefore, the delineation of distance zone would be unseen. Implementation of the Alternative 1 would have a negligible impact on visual resources and would be consistent with current land use in the project area.

The DOE has committed to remove surface structures and restore the surface area at the WIPP facility to as near its original contours as possible at the time the WIPP facility is closed.

3.8.2.2 Alternative 2

The analysis for Alternative 1 is applicable to Alternative 2 because the differences in construction and operation methodologies would not lead to any greater impact to visual resources. The major difference with Alternative 2 is the Sprung® structure that would be easily visible to the casual observer.

Implementation of Alternative 2 would have a negligible impact on visual resources and would be consistent with current land use in the project area. The DOE has committed to remove surface structures and restore the surface area at the WIPP facility to as near its original contours as possible at the time the WIPP facility is closed.

3.8.2.3 No Action Alternative

Under the No Action Alternative, the existing visual resources would remain unmodified. Therefore, no impacts would occur under the No Action Alternative.

4. CUMULATIVE IMPACTS

The Council on Environmental Quality regulations in "Cumulative Impact" (40 CFR 1508.7) define cumulative impacts as "the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." This chapter presents an analysis of the resource-specific cumulative impacts resulting from implementation of the proposed action in conjunction with any reasonably foreseeable projects to be initiated at the WIPP site. The focus of the cumulative impacts analysis is this DEA is on reasonably foreseeable projects that are within the same geographic and temporal space as the proposed action. Past and present actions at the WIPP site are represented in the description of the proposed action, the action alternatives and the resource impact analysis discussed in this document, and in the NEPA analyses referenced herein.

4.1 Reasonably Foreseeable Projects Considered for Cumulative Impacts Analysis

4.1.1 Permanent Ventilation System

As a result of the February 2014 events at the WIPP facility, the existing ventilation system is being operated in filtration mode. Operating the system in this mode cannot provide the U/G with sufficient air to support simultaneous mining and waste emplacement operations. The DOE has begun implementing a three-phase ventilation system upgrade to support increased U/G operations. The first phase, the Interim Ventilation System, is already operational. The second phase is the addition of the Supplemental Ventilation System (SVS) which is anticipated to be operational early in Fiscal Year 2018. The SVS will facilitate full-scale mining operations by creating an unfiltered exhaust path for construction air. The third phase of the ventilation upgrade includes construction and installation of a new Permanent Ventilation System (PVS). The PVS would support simultaneous waste emplacement, mining, and mine maintenance operations. The PVS would consist of the *Safety Significant Confinement Ventilation System project (15-D-411) and the Exhaust Shaft project (15-D-412)* (DOE, 2015). The Safety Significant Confinement Ventilation System project would include a new filter building on the surface and the Exhaust Shaft (now referred to as the New Ventilation Shaft) project would require the design and mining of a new 2,150-ft (655-m) vertical shaft and two new horizontal drifts (tunnels) to the WIPP U/G. The PVS is expected to be operational in the 2021 timeframe and will be the subject of a project-specific NEPA evaluation.

4.2 Potential Cumulative Impacts by Environmental Resource Area

4.2.1 Geology and Soils

As indicated in Chapter 3 of this DEA, implementation of action Alternatives 1 or 2 would not result in a significant increase in geology and soils impacts beyond those already realized with the construction and operation of the WIPP facility. The PVS project listed in Section 4.1 is still undergoing design and a final determination of additional geology and soil impacts cannot be made at this time. If the PVS is similar to other shaft sinking projects at the WIPP facility, then impacts to geology and soils from implementation of the proposed action in conjunction with the PVS project would be negligible.

4.2.2 Hydrology/Water Quality

Hydrology and water quality are currently being controlled by the use of lined evaporation ponds to prevent infiltration of salt-laden waters into the shallow subsurface. As indicated in Chapter 3 of this DEA, implementation of Action Alternatives 1 or 2 would also use lined ponds to capture water and prevent infiltration and, therefore, would not result in significant hydrology impacts. Initial design for the PVS project listed in Section 4.1 includes lined mined-materials storage piles and lined run-off ponds so that hydrology and groundwater would not be affected. Therefore, the impacts to hydrology and water quality would be negligible as the result of the implementation of the proposed action in conjunction with the PVS project.

4.2.3 Air Quality

Past and ongoing operation of the WIPP facility does not significantly impact air quality. As indicated in Chapter 3 of this DEA, implementation of Action Alternatives 1 or 2 would not result in significant air quality impacts because impacts only occur during construction, which is of short duration. Likewise, construction of the PVS project listed in Section 4.1 will be for a short period of time and will not significantly impact air quality. Operation of the PVS, using filtration, will actually reduce fugitive salt emissions than what was considered in the FEIS. Therefore, the impacts to air quality would be minimal as the result of implementation of the proposed action in conjunction with the PVS project.

4.2.4 Cultural Resources

Management of cultural resources is an ongoing activity mandated by the Land Management Plan. New construction activities undergo archeological investigation. As indicated in Chapter 3 of this DEA, implementation of Action Alternatives 1 or 2 are not anticipated to result in significant cultural resources impacts, although surveys will be conducted in undisturbed areas. Similar consideration will be given to the PVS project listed in Section 4.1. Therefore, the impacts to cultural resources from the proposed action would be negligible. Likewise, impacts from implementation of the proposed action in conjunction with the PVS project would be negligible.

4.2.5 Hazardous Materials and Hazardous Wastes

Hazardous materials and hazardous waste, including radioactive waste are managed as part of ongoing day-to-day activities at the WIPP facility. As indicated in Chapter 3 of this DEA, impacts from the implementation of Action Alternatives 1 or 2 would be negligible. Impact from hazardous materials and wastes and radiological waste (filter waste) will be managed in accordance with existing policies and procedures. The PVS project listed in Section 4.1 is expected to produce additional waste streams (salt waste, filter waste, brine waste); however, these are similar to waste streams already generated at the WIPP facility. The overall volume of waste is well within the capacity of the WIPP facility waste management processes. Therefore, negligible impacts from hazardous waste and hazardous materials, including radioactive waste are anticipated as the result of the implementation of the proposed action in conjunction with the PVS project.

4.2.6 Nuclear and Operational Safety

The WIPP facility operates under the DOE system of standards and orders to ensure the safety and protection of workers, the public, and the environment. The WIPP facility has the personnel, equipment, and procedures to safely carry out its mission. As indicated in Chapter 3 of this DEA, implementation of Action Alternatives 1 or 2 would not introduce either industrial or radiological risks beyond those already dealt with in the DSA and implementing procedures. Therefore, the nuclear safety impacts from the Alternatives will be negligible. PVS project listed in Section 4.1 will not introduce any nuclear safety risks, however, the industrial risks associated with shaft sinking and construction are different than the day-to-day risks encountered by WIPP facility workers. The PVS project will use the services of contractors for construction and outfitting. These individuals will be specialists in shaft sinking and construction and will have an awareness of industrial risks associated with the project. Once operational, the PVS poses industrial risks similar to those encountered in the day-to-day operation of the U/G facility. Therefore, the impacts to nuclear or operational safety would be negligible.

4.2.7 Visual Resources

The WIPP facility was constructed and is operated with visual resources in mind. The remote location and use of BLM recommended paint colors mitigate impacts to visual resources. Action Alternatives 1 or 2 would not result in significant visual resource impacts since the location is remote and the only large structure would be the Sprung® structure for Alternative 2. The PVS project listed in Section 4.1 does not include large buildings and is adjacent from the existing WIPP facility structures. After construction, a headframe and several new buildings will remain. Because of their proximity to existing structures and the remoteness of the WIPP site, they will significantly impact visual resources. Therefore, impacts to visual resources would be negligible as the result of implementation of the proposed action in conjunction with the PVS.

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APPENDIX A, PUBLIC INVOLVEMENT

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APPENDIX B, Comment Resolution

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