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DEC 22 2017

Mr. John E. Kieling, Chief  
Hazardous Waste Bureau  
New Mexico Environment Department  
2905 Rodeo Park Drive East, Building 1  
Santa Fe, New Mexico 87505-6303

**Subject:** Request for a Determination of Class for a Permit Modification Request for the Waste Isolation Pilot Plant Hazardous Waste Facility Permit, Number NM4890139088-TSDF

Dear Mr. Kieling:

The Permittees are requesting a determination of class in accordance with 20.4.1.900 NMAC (incorporating 40 CFR 270.42(d)) for the following:

- Excavation of a New Shaft and Associated Connecting Drifts

The Permittees request the modification be reviewed and approved as a Class 2 modification. Justification for this request is included in Item 2 of the permit modification request. Your timely notification of the classification would be appreciated.

We certify under penalty of law that this document and all attachments were prepared under our direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on our inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of our knowledge and belief, true, accurate, and complete. We are aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have any questions, please contact Mr. George T. Basabilvazo at 575-234-7488.

Sincerely,

**Signatures on File**

Todd Shrader, Manager  
Carlsbad Field Office

Bruce C. Covert, Project Manager  
Nuclear Waste Partnership LLC

Enclosure

cc: w/enclosure  
R. Maestas, NMED                      \* ED  
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**Determination of Class Modification**

**Excavation of a New Shaft and Associated Connecting Drifts**

**Waste Isolation Pilot Plant**

**Carlsbad, New Mexico**

**WPP Permit Number - NM4890139088-TSDF**

**December 2017**

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Transmittal Letter

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## **Acronyms and Abbreviations**

|        |                                          |
|--------|------------------------------------------|
| AIS    | Air Intake Shaft                         |
| cfm    | cubic feet per minute                    |
| CFR    | Code of Federal Regulations              |
| DOE    | U.S. Department of Energy                |
| EPA    | U.S. Environmental Protection Agency     |
| NMAC   | New Mexico Administrative Code           |
| NMED   | New Mexico Environment Department        |
| Permit | WIPP Hazardous Waste Facility Permit     |
| PMR    | Permit Modification Request              |
| PPA    | Property Protection Area                 |
| PVS    | Permanent Ventilation System             |
| RCRA   | Resource Conservation & Recovery Act     |
| S#5    | Shaft #5                                 |
| SVS    | Supplemental Ventilation System          |
| TRU    | transuranic                              |
| TSDF   | Treatment, Storage and Disposal Facility |
| UVS    | underground ventilation system           |
| VFD    | variable frequency drive                 |
| VOC    | volatile organic compound                |
| WIPP   | Waste Isolation Pilot Plant              |

## Overview of the Permit Modification Request

This document contains a Permit Modification Request (**PMR**) for the Waste Isolation Pilot Plant (**WIPP**) Hazardous Waste Facility Permit (**Permit**), Permit Number NM4890139088-TSDF.

As discussed in Section 2 below, this modification is not explicitly listed in 20.4.1.900 New Mexico Administrative Code (**NMAC**) incorporating Title 40 of the Code of Federal Regulations (**CFR**) §270.42, Appendix I. In accordance with 20.4.1.900 NMAC (incorporating Title 40 CFR §270.42(d)(1)) the U.S. Department of Energy (**DOE**) and Nuclear Waste Partnership LLC, collectively referred to as the Permittees, are requesting a determination by the New Mexico Environment Department (**NMED**) that the modification be reviewed and approved as a Class 2 modification. The necessary information to support the requested classification is provided in Item 2 below.

The modification consists of a new shaft, designated as Shaft #5 (**S#5**), along with drifts to connect S#5 to the existing WIPP underground facility. The S#5 design is one of two projects referred to as the Permanent Ventilation System (**PVS**) upgrades, which include additional intake fans on the surface of the facility. The design of S#5 assumes that new exhaust fans and a new filter building are operational and that the Supplemental Ventilation System (**SVS**) and Interim Ventilation System will no longer be operational. The new exhaust fans and associated filtration system are being addressed via a separate PMR. Shaft #5 will be located nominally 1,200 feet west of the Air Intake Shaft (**AIS**). Shaft #5 will be used as the primary air intake shaft for the underground repository.

The S#5 design allows for increased ventilation airflow into the underground and an unfiltered exhaust path through the existing AIS for the Construction Circuit airflow. This design allows for concurrent mining (unfiltered ventilation), maintenance (either unfiltered or filtered ventilation, depending on location), and waste emplacement operations (filtered ventilation) to take place. This design also allows the salt particulate that is generated in the Construction Circuit (generated by mining) to be exhausted through an unfiltered exhaust path while the particulate that is generated in the North, Disposal, and Waste Shaft Station Circuits (generated by travel and maintenance operations) is exhausted through the Salt Reduction Building prior to being routed through the filters. This design will not only reduce the particulate build-up on the filters, it will reduce the amount of particulate from the Salt Reduction Building that must be disposed of. The intake fans pushing air into the repository through S#5 represent a technological improvement for the WIPP facility. Previously, underground ventilation system (**UVS**) fans worked only in the exhaust mode by drawing air through the WIPP facility. The improved technology includes fans with variable frequency drives (**VFD**) and automatic controls that link the operation of the intake and exhaust fans together. This improvement will provide additional control of the variabilities associated with the ventilation system and allow the Permittees to increase the Permit-required differential pressure between the Construction and Disposal Circuits. The differential pressure assures any ventilation leakage flows from the Construction Circuit into the Disposal Circuit (Permit Attachment A2, Section A2-2a(3), *Subsurface Structures*). Pushing air through the facility will also provide additional control in order to minimize ventilation impacts caused by changes in ambient temperature and pressure. The following summarizes the changes that are being proposed to the Permit text and figures:

- Drifts will be excavated to connect S#5 to the existing WIPP underground facility for access and ventilation purposes. The WIPP underground facility footprint and location

of S#5, along with planned connecting drifts, are shown in proposed revisions to figures in Permit Attachments A2, A4, B, D, and G.

- Intake fans will be located on the surface of the facility and connected via ducting and a plenum to S#5. A single fan will operate at any one time with a second fan available as a back-up fan. The collar of S#5 will be covered to allow the surface fan to drive air into the underground repository. With S#5 acting as an intake shaft, the AIS will become an exhaust shaft for the Construction Circuit exhaust air. A plenum, ventilation ducting, and an exhaust stack will be added to the AIS to disperse salt particulate away from site structures. The North, Disposal, and Waste Shaft Station Circuits will continue to exhaust through the Exhaust Shaft and the filtration system. The four existing shafts and UVS are described in text and figures throughout the Permit in Attachments A, A2, and A4. Descriptions and figures in the aforementioned attachments are being modified to incorporate S#5, the planned connecting drifts, and changes to the description of the UVS.
- A nominal 22-acre Property Protection Area (**PPA**) encompassing the area around S#5 will be added to the property description in Permit Attachment A. Permit Attachment B, Figure B2-2, *Planimetric Map-WIPP Facility Boundaries* and Figure B2-2a, *Legend to Figure B2-2* are being replaced to show the additional PPA, estimated acreage around S#5, and to make corrections and editorial changes.
- One additional figure is being added to Permit Attachment D. Figure D-5-S#5, *Fire-Water Distribution System (with S#5)* shows the fire-water loop and fire hydrants servicing S#5.
- Permit Attachment D, Figure D-8, *WIPP Site Evacuation Routes*, is being modified to show the evacuation route from the S#5 area on the west side of the North Access Road.
- The *Introduction* to Permit Attachment G, *Closure Plan*, is being modified to indicate that construction of the shaft seals will apply to all shafts, not just the existing four shafts. The Permittees are planning to modify the Closure Plan to incorporate S#5 in the next Permit renewal application (to be submitted in 2020).

The Permittees are proposing changes to the following Permit Attachments:

- Attachment A, *General Facility Description and Process Information*, Section A-3, *Property Description*
- Attachment A, *General Facility Description and Process Information*, Section A-4, *Facility Type*
- Attachment A2, *Geologic Repository*, Section A2-1, *Description of the Geologic Repository*
- Attachment A2, *Geologic Repository*, Section A2-2a(2), *Shafts*
- Attachment A2, *Geologic Repository*, Section A2-2a(3), *Subsurface Structures, Underground Facilities Ventilation System*

- Attachment A2, *Geologic Repository*, Section A2-2a(3), *Subsurface Structures, Underground Ventilation System Description*
- Attachment A2, *Geologic Repository*, Section A2-2a(3), *Subsurface Structures, Underground Ventilation Modes of Operation*
- Attachment A2, *Geologic Repository*, Figure A2-1, *Repository Horizon*
- Attachment A2, *Geologic Repository*, Figure A2-2-S#5, *Spatial View of the Miscellaneous Unit and Waste Handling Facility (with S#5)*
- Attachment A2, *Geologic Repository*, Figure A2-9c, *Underground Ventilation System Airflow (with S#5)*
- Attachment A4, *Traffic Patterns*, Figure A4-4, *Typical Underground Transport Route Using E-140*
- Attachment A4, *Traffic Patterns*, Figure A4-4a, *Typical Underground Transport Route Using W-30*
- Attachment B, *Hazardous Waste Permit Application Part A*, Appendix B2, *Maps*, Figure B2-2, *Planimetric Map-WIPP Facility Boundaries*
- Attachment B, *Hazardous Waste Permit Application Part A*, Appendix B2, *Maps*, Figure B2-2a, *Legend to Figure B2-2*
- Attachment B, *Hazardous Waste Permit Application Part A*, Appendix B3, *Facilities*, Addition of Figure B3-1-S#5, *Spatial View of the WIPP Facility (with S#5)*
- Attachment B, *Hazardous Waste Permit Application Part A*, Appendix B3, *Facilities*, Figure B3-2, *Repository Horizon*
- Attachment D, *RCRA Contingency Plan*, Figure D-2-S#5, *Spatial View of the WIPP Facility (with S#5)*
- Attachment D, *RCRA Contingency Plan*, Figure D-3, *WIPP Underground Facilities*
- Attachment D, *RCRA Contingency Plan*, Figure D-5, *Fire-Water Distribution System*
- Attachment D, *RCRA Contingency Plan*, Figure D-5-S#5, *Fire-Water Distribution System (with S#5)*
- Attachment D, *RCRA Contingency Plan*, Figure D-7, *Designated Underground Assembly Areas*
- Attachment D, *RCRA Contingency Plan*, Figure D-8, *WIPP Site Evacuation Routes*
- Attachment G, *Closure Plan*, *Introduction*
- Attachment G, *Closure Plan*, Figure G-1, *Location of Underground HWDUs and Anticipated Closure Locations*

- Attachment G, Closure Plan, Figure G-6, *Approximate Locations of Boreholes in Relation to the WIPP Underground*

These changes do not modify the Permit condition listed in Permit Part 4, Section 4.5.3.2., *Ventilation*, to maintain a minimum active room ventilation rate of 35,000 standard cubic feet per minute nor do they reduce the ability of the Permittees to provide continued protection to human health and the environment.

The requested modification to the Permit and related supporting documents are provided in this PMR. The proposed modification to the text of the Permit has been identified using **red** text and double underline and a ~~strikeout~~ font for deleted information. All direct quotations are indicated by italicized text. The following information specifically addresses how compliance has been achieved with Permit, Part 1, Section 1.3.1., for submission of this Class 2 PMR.

**1. 20.4.1.900 NMAC (incorporating 40 CFR 270.42(b)(1)(i)) requires the applicant to describe the exact change to be made to the permit conditions and supporting documents referenced by the Permit.**

The Permittees are proposing modifications to the Permit to incorporate PVS upgrades to the WIPP facility UVS. These upgrades include S#5, associated intake fans with VFDs and electronic connections to the exhaust fans, associated underground connecting drifts, and an unfiltered exhaust stack on the AIS. No changes will be made to the ventilation-related Permit conditions in Part 4.

This section of the PMR provides a description of the proposed ventilation upgrades and identifies the impacts to the Permit as a result of these changes. These upgrades are necessary for the UVS to achieve a flowrate that is conducive to concurrent mining, maintenance, and disposal operations and to enhance the unfiltered exhaust path for the Construction Circuit airflow. A Notification of Planned Change was submitted to the New Mexico Environment Department on July 13, 2017<sup>1</sup>, describing S#5 and associated connecting drifts.

Shaft #5 will be located nominally 1,200 feet west of the existing AIS. A series of drifts and cross-cuts, to be used for ventilation and access, will be excavated from S#5 to the existing WIPP underground facility.

Two intake fans will be located on the surface and connected to S#5 via ducting and a plenum. One fan will operate while a second fan will be available for back-up. The fans are intake fans and will drive air into the repository through S#5. Shaft #5 will be covered with a steel cover bolted to the collar to keep the intake air in the shaft moving toward the underground.

Shaft #5 will be the primary source of intake air for the underground facility. The intake air from S#5 will be used to ventilate the North, Construction, and Disposal Circuits. The ventilation circuits are described in Permit Attachment A2, Section A-2a(3), *Underground Facilities Ventilation System*. The Salt Handling Shaft will downcast and will supplement the intake air

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<sup>1</sup> Notification of Planned Change to the Permitted Facility Regarding the Excavation and Construction of Shaft and Associated Drifts, Hazardous Waste Facility Permit, Number: NM4890319088-TSDF. Letter to Mr. John E. Kielling, Chief, Hazardous Waste Bureau, New Mexico Environment Department. July 13, 2017.

from S#5 that is used to ventilate the north area of the underground. The Waste Shaft will continue to provide the intake air for the Waste Shaft Station Circuit.

The North, Disposal, and Waste Shaft Station Circuits will exhaust through the existing Exhaust Shaft. The salt particulate that is generated in the North, Disposal and Waste Shaft Station Circuits (generated by maintenance work and transportation) will be removed from the exhaust air by the Salt Reduction Building prior to routing the air through the filtration system. This will reduce the particulate build-up on the roughing filters. The exhaust air from the Construction Circuit (mining) will be routed through the AIS, reducing the amount of particulate that is harvested by the Salt Reduction Building, thereby reducing the amount of particulate that must be characterized and disposed of. The AIS will be outfitted with a plenum, ducting, and an unfiltered exhaust stack. The AIS will be covered so that the exhaust air travels through the plenum, ducting, and exhaust stack. The exhaust stack at the AIS will protect existing surface structures by dissipating the salt particulate being exhausted from the construction area of the underground. Because the AIS will only exhaust air from the Construction Circuit which does not contain volatile organic compounds (**VOCS**) from the waste and does not exhaust air from the Disposal and Waste Station Circuits, no VOC monitoring is necessary. The air in the Construction Circuit is separated from the Disposal Circuit in all modes by the use and placement of bulkheads and regulators, which assist in maintaining the differential pressures necessary to maintain separate air circuits.

Because the facility will have both intake and exhaust fans capable of providing the needed ventilation, the fans will be interconnected to assure synchronization of the S#5 intake fan with the exhaust fans. Variable frequency drives on the fans allow the fan speeds to be continuously varied so as not to overwhelm other system components. Synchronization of the fans will be accomplished with control logic interconnections and interlocks. This represents a new technology for the WIPP facility since previously, interconnections and interlocks did not allow for continuous adjustment of fan speed to control the ventilation flow rates. The result is greater control of the airflow and resultant pressure differentials as underground conditions change (e.g., large barometric pressure or temperature changes).

Changes are being proposed to the descriptive text, figures, and tables in the Permit attachments as listed below:

- Descriptive text in Attachment A is being changed to include a second PPA around S#5 and to describe the location of S#5.
- Descriptive text in Attachment A2 is being changed to describe the configuration of the five shafts for ventilation (e.g., intake or exhaust air) when S#5 is in use; describe the physical characteristics of S#5 and the AIS; and describe how the S#5 surface fans will operate with the ventilation modes of operation.
- Figures in Attachments A2 and A4 are being modified or added to show the location of S#5 and the planned connecting drifts, where applicable.
- Figures in Attachment B, Appendix B2 and B3 are being modified or added to show the location of S#5 and the planned connecting drifts.
  - Figure B2-2 and Note 2 in Figure B2-2a is being replaced to address the addition of a second PPA encompassing the area around S#5.

- Note that revised pages to Form OMB#: 2050-0024 (*RCRA Hazardous Waste Part A Application* forms) are not included. These will be provided as a Class 1 Permit Modification Notification once this PMR has been adjudicated.
- Figures in Attachment D are being modified or added to show the location of S#5 and the planned connecting drifts.
- One figure in Attachment D is being modified to show updates to the fire-water loop. An additional figure is being added to show the fire-water loop around the S#5 area.
- One figure in Attachment D is being modified to show the surface evacuation route from the S#5 area.
- Descriptive text in the *Introduction* of Attachment G, *Closure Plan*, is being modified to indicate that the shaft seal systems apply to all shafts.
- Figures in Attachment G are being modified to show the location of S#5 along with the planned connecting drifts.

Proposed text changes are included in Appendix A and Appendix B of this PMR. Appendix A provides a detailed list of changes by Permit section and Appendix B provides the proposed redline/strikeout to the existing Permit language. Note also a table entitled “Description of Changes and Explanation of Need” is included in Section 3 of this Overview. The following is the list of the appendices to this PMR:

- Appendix A, *Table of Changes*, describes each change that is being proposed.
- Appendix B, *Proposed Revised Permit Text*, identifies the proposed changes to the permit text in redline strikeout.
- Appendix C, *WIPP New Shaft and Connecting Drifts Illustrations* identifies the surface location and the proposed connecting drifts.

**2. 20.4.1.900 NMAC (incorporating 40 CFR 270.42(d)), allows the applicant to request a determination by the NMED that the modification should be reviewed and approved as a Class 2 modification.**

The regulations, at 20.4.1.900 NMAC (incorporating 40 CFR §270.42(d)), cover situations when the proposed permit modification is not explicitly listed in 20.4.1.900 NMAC (incorporating 40 CFR §270.42 Appendix I). One option available to the Permittees is to request the NMED review and approve the modification as a Class 2 modification. In order to use this option, the Permittees must provide the necessary information to support the classification determination request.

In exercising this option, there are two overarching considerations that must be met: first is the similarity of the modification to other Class 2 permit modifications codified in 20.4.1.900 NMAC (incorporating 40 CFR §270.42 Appendix I) and second is whether the modification fits one of the general categories of changes listed in 20.4.1.900 NMAC (incorporating 40 CFR §270.42(d)(2)(ii)). The following is a discussion of these considerations.

The WIPP repository has been permitted under the rules found in 20.4.1.500 NMAC (incorporating 40 CFR §264, Subpart X, *Miscellaneous Units*). Other types of regulated units are specifically addressed in 20.4.1.900 NMAC (incorporating 40 CFR §270.42 Appendix I), however, Miscellaneous Units are not. Therefore, specific classifications for modifications to Miscellaneous Unit Permits are not provided. A similar type of change that is identified for other units in 20.4.1.900 NMAC (incorporating 40 CFR §270.42 Appendix I) is changes to the regulated unit that does not affect the capacity of the unit to manage hazardous waste. The changes proposed in this PMR are similar in that they are changes to a Miscellaneous Unit that do not affect the unit capacity. The following Class 2 items in 20.4.1.900 NMAC (incorporating 40 CFR §270.42 Appendix I) illustrate this similarity:

- 40 CFR §270.42 Appendix I, F. *Containers* 2.a. *Modification of a container unit without increasing the capacity of the unit ... 2;*
- 40 CFR §270.42 Appendix I, G. *Tanks* 2. *Modification of a tank unit or secondary containment system without increasing the capacity of the unit ... 2;*
- 40 CFR §270.42 Appendix I, H. *Surface Impoundments*, 3. *Modification of a surface impoundment unit without increasing the facility's surface impoundment storage or treatment capacity and without modifying the unit's liner, leak detection system, or leachate collection system ... 2;*
- 40 CFR §270.42 Appendix I, I. *Enclosed Waste Piles*, 2. *Modification of waste pile unit without increasing the capacity of the unit ... 2;*
- 40 CFR §270.42 Appendix I, M. *Containment Buildings*, 2. *Modification of a containment building unit or secondary containment system without increasing the capacity of the unit...2;*

The changes proposed in this PMR consist of modifications that do not impact the capacity of the underground Hazardous Waste Disposal Units. Therefore, the changes are similar to a “Modification of a container unit without increasing the capacity of the unit...2 (40 CFR 270.42, Appendix I, F. Containers, 2. a).” The changes impact the Miscellaneous Unit (e.g., the use of the Air Intake Shaft as an exhaust shaft) via the changes in the operation of the ventilation system. As discussed above, the unit-specific entries in 20.4.1.900 NMAC (incorporating 40 CFR §270.42 Appendix I) treat these types of changes as Class 2 modifications.

Based on the similarity to these items, the Permittees propose that the modification be reviewed and approved as a Class 2.

As further support for reviewing and approving this modification as a Class 2 modification, the regulations at 20.4.1.900 NMAC (incorporating 40 CFR §270.42(d)(2)(ii)) identify the following general criteria for Class 2 modifications:

*(ii) Class 2 modifications apply to changes that are necessary to enable a permittee to respond, in a timely manner, to, (A) Common variations in the types and quantities of the wastes managed under the facility permit, (B) Technological advancements, and (C) Changes necessary to comply with new regulations, where these changes can be implemented without substantially changing design specifications or management practices in the permit.*

The applicability of these criteria to the proposed changes is discussed below.

**Criterion (A), Common variations in the types and quantities of the wastes managed under the facility permit:** This criterion does not apply to this proposed modification because the proposed changes do not affect the type or amount of TRU mixed waste to be managed at the WIPP facility.

**Criterion (B), Technological advancements:** In a recent publication, the EPA addressed modifications for technological improvements with an example as follows:<sup>2</sup>

*A.1. Improvements in Technological Efficiency*

*After facilities are permitted, they often need to make changes to their waste handling practices in order to stay competitive and to adjust to market demands. In order to make these changes, facilities often need to modify their permits.*

*Most permitted facilities originally identified their types of equipment and units used to manage hazardous waste in their permit applications in the 1980s. Some of the equipment and processes may now be outdated. Multitudes of technological advances have occurred since the 1980s that can produce environmental benefits (as well as cost savings to the facility).*

*A number of advances have also been made in the methods to address contamination. See the highlighted Axiall Corp case study for an example of the use of a new barrier wall to control lateral migration. This case study, like many others, also applies to other categories. The changes at Axiall Corp also ensure long-term environmental protection after operations cease (covered in Section C).*

Although this PMR does not propose changes to waste handling practices at the WIPP facility, it does include a ventilation control technology that has not previously been used as part of the UVS at the WIPP facility. Criterion (B), *Technological advancements*, applies to the extent that when Shaft #5 becomes available to the Permittees, it will advance the Permittees' ability to control the underground ventilation and enhance control over the differential pressures maintained between the Construction Circuit and the North, Waste Shaft, and Disposal Circuits. This increased control improves the prevention of leakage of contaminated air from the Disposal Circuit and minimizes ventilation impacts associated with ambient temperature and pressure changes. This increases the Permittees' ability to prevent releases, thereby enhancing protection of public health and the environment and to comply with the Permit Attachment A2, Section A2-2a(3), *Subsurface Structures*. Permit Attachment A2, Section A2-2a(3), *Subsurface Structures*, requires that a pressure differential is maintained between the construction side and the waste disposal side to ensure that any leakage is towards the disposal side. Furthermore, the proposed changes improve the processes that the Permittees use to provide ventilation air to support workers in the underground where equipment exhaust gases and particulate could pose a health and safety risk as they perform day-to-day mining, maintenance, and waste management activities.

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<sup>2</sup> EPA, Permit Modifications Report: Safeguarding the Environment in the Face of Changing Business Needs, EPA530-R-15-001, January 2016.

**Criterion (C), Changes necessary to comply with new regulations, where these changes can be implemented without substantially changing design specifications or management practices in the permit:** This criterion does not apply to this proposed modification; however, a recent publication by the EPA expands upon this criterion further as follows:<sup>3</sup>

*Class 2 modifications address common, facility-initiated changes needed to maintain safety or regulatory compliance at the facility. Class 2 modifications enable facility owners/operators to respond to variations in the types and quantities of waste managed by the facility, technological advancements, and new regulatory requirements. Class 2 modifications do not substantially alter the facility's design or waste management practices as outlined in the initial permit. Class 2 modifications do not reduce, and in most cases should enhance, the facility's ability to protect human health and the environment.*

Due to the EPA's use of the term "substantially", it is appropriate to address whether or not the changes represent "substantial" changes. With regard to changes to the design, the repository is a mined facility that includes shafts and tunnels, which are designed to accommodate the mine depth and the various functions such as hoisting, salt removal, waste emplacement, and ventilation. This fundamental design of the repository is not changed by this proposed modification; the Permittees are simply proposing to modify the manner in which certain components are used (i.e., downcast shafts become upcast shafts, fans push air through portions of the facility instead of pulling air through the entire facility). Furthermore, although changes to operating procedures for the revised ventilation system will be necessary, the ventilation processes for the permitted units will remain unchanged. Evacuation routes for workers in the regulated unit remain the same. Changes to underground drawings and maps are only affected outside the permitted unit (i.e., entries that lie south of S-1600 per Permit Part 4, Section 4.5.3.1., *Underground Traffic Flow*). The changes being made primarily impact descriptive text in the Permit, such as the text in Permit Attachment A2, Section A2-2a(3), *Underground Ventilation System Description*. This proposed modification does not alter the Permit condition relative to minimum ventilation (i.e., 35,000 scfm in an active disposal room when workers are present actively emplacing waste) found in Permit Part 4, Section 4.5.3.2., *Ventilation*. The Permittees are not proposing changes that qualify as a Class 3 modification (i.e., defined as substantial changes by the EPA in 20.4.1.900 NMAC (incorporating 40 CFR §270.42 Appendix I)) such as increase in the disposal capacity, new monitoring, changes in response action plans that reduce their effectiveness, addition of new or different waste, addition of new units to be used during closure, or changes to the groundwater protection standards.

Therefore, the Permittees are requesting the Class 2 process be used to review and approve this proposed modification because:

- This proposed modification makes changes that the EPA considers to be Class 2 for other permitted units,

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<sup>3</sup> United States Environmental Protection Agency, Resource Conservation and Recovery Act Public Participation Manual, 530-R-16-013, Office of Land and Emergency Management January 11, 2017, Washington, DC 20460

- This proposed modification provides technological advancements that enhance the Permittees' ability to protect human health and the environment,
- This proposed modification does not substantially change the design of or the waste management practices at the WIPP facility,
- This proposed modification does not alter the Permit condition relative to minimum ventilation (i.e., 35,000 scfm in an active disposal room when workers are present actively emplacing waste) found in Permit Part 4, Section 4.5.3.2., *Ventilation*.

Furthermore, the Permittees are requesting the Class 2 process to review and approve the modification for the following additional reasons:

- The Class 2 process assures adequate time for the NMED to evaluate that the change can be made in a manner that protects human health and the environment
- The Class 2 process assures adequate public participation
- The Class 2 process meets the Permittees' need for a timely decision

**3. 20.4.1.900 NMAC (incorporating 40 CFR 270.42(b)(1)(iii)), requires the applicant to explain why the modification is needed.**

As a result of the 2014 radiological event, portions of the WIPP underground facility and the existing surface-mounted ventilation and exhaust systems have become radiologically contaminated; therefore, a decision was made to operate using continuous filtration of the underground exhaust flow (filtration mode). Continuous filtration mitigates any future radioactive releases. The filtration system, as originally designed, can only accommodate a small portion of the original design flow needed to support the normal operations of construction, maintenance, and waste emplacement. The addition of S#5 and associated connecting drifts represents upgrades to the UVS and will provide a new intake and exhaust system capable of supporting full scale, concurrent mining, maintenance, and waste emplacement operations.

Shaft #5 will be located nominally 1,200 feet west of the AIS and will provide the majority of the intake air to the repository. The Salt Handling Shaft and Waste Shaft will provide additional minor amounts of intake air to the North Ventilation Circuit and the Waste Shaft Station Circuit, respectively. The AIS will be converted from an intake shaft to an exhaust shaft for the Construction Circuit exhaust air only, while the North, Disposal, and Waste Shaft Station Circuits will continue to exhaust through the Exhaust Shaft and the filtration system. This modification is an upgrade to the existing ventilation system with a two-fold purpose:

- Allow the Construction Circuit air to exhaust through the unfiltered AIS as a means of reducing particulate build-up on the roughing filters in the Exhaust Filter Building described in Permit Attachment A2, Section A2-2a(3), *Underground Ventilation System Description* and reducing the amount of salt particulate (harvested by the Salt Reduction Building) that must be characterized and disposed of.
- Aid in increasing the intake air volume that will allow for concurrent mining, waste emplacement, and support activities (e.g., maintenance, ground control, infrastructure modifications).

Shaft #5 is needed to perform underground work concurrently and in a timely manner which allows the Permittees to maintain and operate the underground facility in a safe manner while at the same time meeting the strategic mission of the DOE.

A Permit modification is necessary because the Permit does not currently accommodate S#5, its surface location and structures, and the connecting drifts to the WIPP underground facility within the descriptive material and figures.

The impacts of S#5, associated intake fans, associated underground connecting drifts, and an unfiltered exhaust stack on the AIS have been evaluated. The results of the Permit impact assessment are identified in Table 1 below. This table identifies that the impacted portions of the Permit are Attachment A, Attachment A2, Attachment A4, Attachment B, Attachment D, and Attachment G. This Permit modification is needed to address the following changes, modifications, or updates due to the addition of a new shaft and associated connecting drifts.

**Table 1: Description of Changes and Explanation of Need**

| Permit Part/Section             | Impact                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Attachment A, Section A-3       | Section A-3 provides the property description including the PPA acreage. Revisions to this section are needed to include a second PPA around S#5.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Attachment A, Section A-4       | This section provides a general description of the facility, both surface and underground, and a general description of how the TRU mixed waste is handled and disposed of. Revisions to this section are needed to describe S#5 and its general location.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Attachment A2, Section A2-1     | This section provides a general description of the repository including the shafts and ventilation flow paths. Revisions to this section are needed to describe the ventilation and operational configuration of the shafts when S#5 is in use.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Attachment A2, Section A2-2a(2) | This section describes the shafts that connect the underground facility to the surface. This section is being revised to include a description of S#5 along with the ventilation configuration of the five shafts when S#5 is in use. The reference in A2-2a(2) to the <i>Final Design Validation Report</i> in Appendix D1 is being modified to indicate that the report discusses the first four shafts as opposed to all shafts. The description of grout injected behind the shaft linings to retard water seepage into the shaft is being modified to include grout or a polymeric spray coating. The description of water rings in the shafts are being modified to include the water stops at the S#5 liner cold joints. A description of the collar configuration for S#5 and the AIS is being added to show that the shafts will be covered. These changes are needed to update the Permit with the descriptive language pertaining to S#5. |
| Attachment A2, Section A2-2a(3) | This section describes the subsurface structures. A description of the ventilation configuration of each shaft when S#5 is in use is being added to the Underground Facilities Ventilation System description. A description of the ventilation configuration of the shafts, the surface intake fans, and the ventilation circuits is being added to the Underground Ventilation System Description section. A reference to 35,000 cubic feet per minute ( <b>cfm</b> ) for each active room will have "standard" added prior to the unit (i.e., cfm) for clarification. These changes are needed to update the Permit with the descriptive language pertaining to S#5.                                                                                                                                                                                                                                                                              |
| Attachment A2, Figure A2-1      | The <i>Repository Horizon</i> figure is being modified to show the location of S#5 along with the planned drifts to connect the shaft to the underground facility. These changes are needed to update the Permit with the information pertaining to S#5.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Attachment A2, Figure A2-2-S#5  | The <i>Spatial View of the Miscellaneous Unit and Waste Handling Facility (with S#5)</i> figure is being added to show the location of S#5 and the planned connecting drifts in relation to the existing underground facility. This change is needed to update the Permit with the information pertaining to S#5.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

| Permit Part/Section           | Impact                                                                                                                                                                                                                                                                                             |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Attachment A2, Figure A2-9c   | Figure A2-9c, <i>Underground Ventilation System Airflow (with Shaft #5)</i> is being added to show the repository ventilation flow with S#5. This change is needed to update the Permit with the information pertaining to S#5.                                                                    |
| Attachment A4, Figure A4-4    | The <i>Typical Underground Transport Route Using E-140</i> figure is being modified to show the location of S#5 along with the planned drifts to connect the shaft to the underground facility. This change is needed to update the Permit with the information pertaining to S#5.                 |
| Attachment A4, Figure A4-4a   | The <i>Typical Underground Transport Route Using W-30</i> figure is being modified to show the location of S#5 along with the planned drifts to connect the shaft to the underground facility. This change is needed to update the Permit with the information pertaining to S#5.                  |
| Attachment B, Figure B2-2     | The <i>Planimetric Map-WIPP Facility Boundaries</i> figure is being modified to show the additional PPA around S#5. This change is needed to update the Permit with the information pertaining to S#5.                                                                                             |
| Attachment B, Figure B2-2a    | The <i>Legend to Figure B2-2</i> figure is being modified to describe the additional PPA area around S#5 in the "Notes" section of the figure. This change is needed to update the Permit with the information pertaining to S#5.                                                                  |
| Attachment B, Figure B3-1-S#5 | The <i>Spatial View of the WIPP Facility (with S#5)</i> figure is being added to show the spatial view of the facility with S#5 and the planned connecting drifts. This change is needed to update the Permit with the information pertaining to S#5.                                              |
| Attachment B, Figure B3-2     | The <i>Repository Horizon</i> figure is being modified to show the location of S#5 along with the planned drifts to connect the shaft to the underground facility. This change is needed to update the Permit with the information pertaining to S#5.                                              |
| Attachment D, Figure D-2-S#5  | The <i>Spatial View of the WIPP Facility (with S#5)</i> figure is being added to show the location of S#5 and the planned connecting drifts in relation to the existing underground facility. This change is needed to update the Permit with the information pertaining to S#5.                   |
| Attachment D, Figure D-3      | The <i>WIPP Underground Facilities</i> figure is being modified to show the location of S#5 along with the planned drifts to connect the shaft to the underground facility. This change is needed to update the Permit with the information pertaining to S#5.                                     |
| Attachment D, Figure D-5      | The <i>Fire-Water Distribution System</i> figure is being replaced to show the fire-water loop extending to the S#5 area. This change is needed to update the Permit with the information pertaining to S#5.                                                                                       |
| Attachment D, Figure D-5-S#5  | The <i>Fire-Water Distribution System (with S#5)</i> figure is being added to show the fire-water loop around the S#5 area. This change is needed to update the Permit with the information pertaining to S#5.                                                                                     |
| Attachment D, Figure D-7      | The <i>Designated Underground Assembly Areas</i> figure is being modified to show the location of S#5 along with the planned drifts to connect the shaft to the underground facility. This change is needed to update the Permit with the information pertaining to S#5.                           |
| Attachment D, Figure D-8      | The <i>WIPP Site Evacuation Routes</i> figure is being modified to show the evacuation routes from the S#5 area. This change is needed to update the Permit with the information pertaining to S#5.                                                                                                |
| Attachment G, Introduction    | This section is being modified to show that the shaft seal systems apply to all shafts, not "the four" shafts as is currently stated. This change is needed to update the Permit with the information pertaining to S#5.                                                                           |
| Attachment G, Figure G-1      | The <i>Location of Underground HWDUs and Anticipated Closure Locations</i> figure is being modified to show the location of S#5 along with the planned drifts to connect the shaft to the underground facility. This change is needed to update the Permit with the information pertaining to S#5. |

| Permit Part/Section         | Impact                                                                                                                                                                                                                                                                                                    |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Attachment G,<br>Figure G-6 | The <i>Approximate Locations of Boreholes in Relation to the WIPP Underground</i> figure is being modified to show the location of S#5 along with the planned drifts to connect the shaft to the underground facility. This change is needed to update the Permit with the information pertaining to S#5. |

4. **20.4.1.900 NMAC (incorporating 40 CFR 270.42 (b)(1)(iv)), requires the applicant to provide the applicable information required by 40 CFR 270.13 through 270.21, 270.62 and 270.63.**

Table 2, *Regulatory Crosswalk*, describes those portions of the Permit that are affected by this PMR. Where applicable, regulatory citations in this modification reference Title 20, Chapter 4, Part 1, NMAC, revised March 9, 2009, incorporating 40 CFR Parts 264 and 270. 40 CFR §§270.16 through 270.21, 270.62, and 270.63 are not applicable at WIPP. Consequently, they are not listed in Table 2.

5. **20.4.1.900 NMAC (incorporating 40 CFR 270.11(d)(1) and 40 CFR 270.30(k)), requires that any person signing under paragraph a and b must certify the document in accordance with 20.4.1.900 NMAC.**

The transmittal letter for this PMR contains the signed certification statement in accordance with Permit Part 1, Section 1.9.

**Table 2: Regulatory Crosswalk**

| Regulatory Citation(s)<br>20.4.1.900 NMAC<br>(incorporating 40 CFR Part 270) | Regulatory Citation(s)<br>20.4.1.500 NMAC<br>(incorporating 40 CFR Part 264) | Description of Requirement                                                             | Added or Clarified Information        |     |    |
|------------------------------------------------------------------------------|------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|---------------------------------------|-----|----|
|                                                                              |                                                                              |                                                                                        | Section of the WIPP Permit            | Yes | No |
| §270.13                                                                      |                                                                              | Contents of Part A permit application                                                  | Attachment B, Part A                  |     | ✓  |
| §270.14(b)(1)                                                                |                                                                              | General facility description                                                           | Attachment A                          | ✓   |    |
| §270.14(b)(2)                                                                | §264.13(a)                                                                   | Chemical and physical analyses                                                         | Part 2.3.1<br>Attachment C            |     | ✓  |
| §270.14(b)(3)                                                                | §264.13(b)                                                                   | Development and implementation of waste analysis plan                                  | Part 2.3.1.1<br>Attachment C          |     | ✓  |
|                                                                              | §264.13(c)                                                                   | Off-site waste analysis requirements                                                   | Part 2.2.1<br>Attachment C            |     | ✓  |
| §270.14(b)(4)                                                                | §264.14(a-c)                                                                 | Security procedures and equipment                                                      | Part 2.6                              |     | ✓  |
| §270.14(b)(5)                                                                | §264.15(a-d)                                                                 | General inspection requirements                                                        | Part 2.7<br>Attachment E1-a           |     | ✓  |
|                                                                              | §264.174                                                                     | Container inspections                                                                  | Attachment E1-b(1)                    |     | ✓  |
| §270.23(a)(2)                                                                | §264.602                                                                     | Miscellaneous units inspections                                                        | Attachment E-1b<br>Attachment E-1b(1) |     | ✓  |
| §270.14(b)(6)                                                                |                                                                              | Request for waiver from preparedness and prevention requirements of Part 264 Subpart C | NA                                    |     |    |
| §270.14(b)(7)                                                                | 264 Subpart D                                                                | Contingency plan requirements                                                          | Part 2.12<br>Attachment D             |     | ✓  |
|                                                                              | §264.51                                                                      | Contingency plan design and implementation                                             | Part 2.12.1<br>Attachment D           |     | ✓  |
|                                                                              | §264.52 (a) & (c-f)                                                          | Contingency plan content                                                               | Attachment D                          | ✓   |    |
|                                                                              | §264.53                                                                      | Contingency plan copies                                                                | Part 2.12.2<br>Attachment D           |     | ✓  |
|                                                                              | §264.54                                                                      | Contingency plan amendment                                                             | Part 2.12.3<br>Attachment D           |     | ✓  |
|                                                                              | §264.55                                                                      | Emergency coordinator                                                                  | Part 2.12.4<br>Attachment D-4a(1)     |     | ✓  |
|                                                                              | §264.56                                                                      | Emergency procedures                                                                   | Attachment D-4                        |     | ✓  |
| §270.14(b)(8)                                                                |                                                                              | Description of procedures, structures or equipment for:                                | Attachment A<br>Part 2.11             |     | ✓  |
| §270.14(b)(8)(i)                                                             |                                                                              | Prevention of hazards in unloading operations (e.g., ramps and special forklifts)      | Part 2.11                             |     | ✓  |
| §270.14(b)(8)(ii)                                                            |                                                                              | Runoff or flood prevention (e.g., berms, trenches, and dikes)                          | Attachment A1-1c(1)<br>Part 2.11      |     | ✓  |
| §270.14(b)(8)(iii)                                                           |                                                                              | Prevention of contamination of water supplies                                          | Part 2.11                             |     | ✓  |
| §270.14(b)(8)(iv)                                                            |                                                                              | Mitigation of effects of equipment failure and power outages                           | Part 2.11                             |     | ✓  |
| §270.14(b)(8)(v)                                                             |                                                                              | Prevention of undue exposure of personnel (e.g., personal protective equipment)        | Part 2.11                             |     | ✓  |

| Regulatory Citation(s)<br>20.4.1.900 NMAC<br>(incorporating 40 CFR Part 270) | Regulatory Citation(s)<br>20.4.1.500 NMAC<br>(incorporating 40 CFR Part 264) | Description of Requirement                                                                                                                                                                                                                                                      | Added or Clarified Information                                                             |     |    |
|------------------------------------------------------------------------------|------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|-----|----|
|                                                                              |                                                                              |                                                                                                                                                                                                                                                                                 | Section of the WIPP Permit                                                                 | Yes | No |
| §270.14(b)(8)(vi)<br>§270.23(a)(2)                                           | §264.601                                                                     | Prevention of releases to the atmosphere                                                                                                                                                                                                                                        | Part 2.11<br>Part 4<br>Attachment A2<br>Attachment D-4e<br>Attachment G-1a<br>Attachment N |     | ✓  |
|                                                                              | 264 Subpart C                                                                | Preparedness and Prevention                                                                                                                                                                                                                                                     | Part 2.10                                                                                  |     | ✓  |
|                                                                              | §264.31                                                                      | Design and operation of facility                                                                                                                                                                                                                                                | Part 2.10                                                                                  |     | ✓  |
|                                                                              | §264.32                                                                      | Required equipment                                                                                                                                                                                                                                                              | Part 2.10.1<br>Attachment D                                                                |     | ✓  |
|                                                                              | §264.33                                                                      | Testing and maintenance of equipment                                                                                                                                                                                                                                            | Part 2.10.2<br>Attachment E-1a                                                             |     | ✓  |
|                                                                              | §264.34                                                                      | Access to communication/alarm system                                                                                                                                                                                                                                            | Attachment E-1a<br>Part 2.10.3                                                             |     | ✓  |
|                                                                              | §264.35                                                                      | Required aisle space                                                                                                                                                                                                                                                            | Part 2.10.4                                                                                |     | ✓  |
|                                                                              | §264.37                                                                      | Arrangements with local authorities                                                                                                                                                                                                                                             | Attachment D-4a(3)                                                                         |     | ✓  |
| §270.14(b)(9)                                                                | §264.17(a-c)                                                                 | Prevention of accidental ignition or reaction of ignitable, reactive, or incompatible wastes                                                                                                                                                                                    | Part 2.9                                                                                   |     | ✓  |
| §270.14(b)(10)                                                               |                                                                              | Traffic pattern, volume, and controls, for example:<br>Identification of turn lanes<br>Identification of traffic/stacking lanes, if appropriate<br>Description of access road surface<br>Description of access road load-bearing capacity<br>Identification of traffic controls | Attachment A4                                                                              | ✓   |    |
| §270.14(b)(11)(i) and (ii)                                                   | §264.18(a)                                                                   | Seismic standard applicability and requirements                                                                                                                                                                                                                                 | Attachment G2-2.2<br>Part B, Rev. 6<br>Chapter B                                           |     | ✓  |
| §270.14(b)(11)(iii-v)                                                        | §264.18(b)                                                                   | 100-year floodplain standard                                                                                                                                                                                                                                                    | Attachment A1-1c(1)<br>Part B, Rev. 6<br>Chapter B                                         |     | ✓  |
|                                                                              | §264.18(c)                                                                   | Other location standards                                                                                                                                                                                                                                                        | Part B, Rev. 6<br>Chapter B                                                                |     | ✓  |
| §270.14(b)(12)                                                               | §264.16(a-e)                                                                 | Personnel training program                                                                                                                                                                                                                                                      | Part 2.8<br>Attachment F                                                                   |     | ✓  |
| §270.14(b)(13)                                                               | 264 Subpart G                                                                | Closure and post-closure plans                                                                                                                                                                                                                                                  | Attachment G                                                                               | ✓   |    |
| §270.14(b)(13)                                                               | §264.111                                                                     | Closure performance standard                                                                                                                                                                                                                                                    | Attachment G-1a                                                                            |     | ✓  |
| §270.14(b)(13)                                                               | §264.112(a), (b)                                                             | Written content of closure plan                                                                                                                                                                                                                                                 | Attachment G-1                                                                             |     | ✓  |
| §270.14(b)(13)                                                               | §264.112(c)                                                                  | Amendment of closure plan                                                                                                                                                                                                                                                       | Part 6.3 Attachment G-1d(4)                                                                |     | ✓  |
| §270.14(b)(13)                                                               | §264.112(d)                                                                  | Notification of partial and final closure                                                                                                                                                                                                                                       | Attachment G-2a                                                                            |     | ✓  |
| §270.14(b)(13)                                                               | §264.112(e)                                                                  | Removal of wastes and decontamination/dismantling of equipment                                                                                                                                                                                                                  | Attachment G-1e(2)                                                                         |     | ✓  |

| Regulatory Citation(s)<br>20.4.1.900 NMAC<br>(incorporating 40 CFR Part 270) | Regulatory Citation(s)<br>20.4.1.500 NMAC<br>(incorporating 40 CFR Part 264) | Description of Requirement                                                                                                                                                                                            | Added or Clarified Information                      |     |    |
|------------------------------------------------------------------------------|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|-----|----|
|                                                                              |                                                                              |                                                                                                                                                                                                                       | Section of the WIPP Permit                          | Yes | No |
| §270.14(b)(13)                                                               | §264.113                                                                     | Time allowed for closure                                                                                                                                                                                              | Part 6.5<br>Attachment G-1d                         |     | ✓  |
| §270.14(b)(13)                                                               | §264.114                                                                     | Disposal/decontamination                                                                                                                                                                                              | Part 6.6<br>Attachment G-1e(2)                      |     | ✓  |
| §270.14(b)(13)                                                               | §264.115                                                                     | Certification of closure                                                                                                                                                                                              | Part 6.7<br>Attachment G-2a                         |     | ✓  |
| §270.14(b)(13)                                                               | §264.116                                                                     | Survey plat                                                                                                                                                                                                           | Part 6.8<br>Attachment G-2b                         |     | ✓  |
| §270.14(b)(13)                                                               | §264.117                                                                     | Post-closure care and use of property                                                                                                                                                                                 | Part 7.3<br>Attachment H-1a                         |     | ✓  |
| §270.14(b)(13)                                                               | §264.118                                                                     | Post-closure plan; amendment of plan                                                                                                                                                                                  | Part 7.5<br>Attachment H-1a(1)                      |     | ✓  |
| §270.14(b)(13)                                                               | §264.178                                                                     | Closure/<br>containers                                                                                                                                                                                                | Part 6.9<br>Attachment A1-1h<br>Attachment G-1      |     | ✓  |
| §270.14(b)(13)                                                               | §264.601                                                                     | Environmental performance<br>standards-Miscellaneous units                                                                                                                                                            | Attachment A-4<br>Attachment D-1<br>Attachment G-1a |     | ✓  |
| §270.14(b)(13)                                                               | §264.603                                                                     | Post-closure care                                                                                                                                                                                                     | Part 7.3<br>Attachment G-1a(3)                      |     | ✓  |
| §270.14(b)(14)                                                               | §264.119                                                                     | Post-closure notices                                                                                                                                                                                                  | Part 7.4<br>Attachment H-2                          |     | ✓  |
| §270.14(b)(15)                                                               | §264.142                                                                     | Closure cost estimate                                                                                                                                                                                                 | NA                                                  |     |    |
|                                                                              | §264.143                                                                     | Financial assurance                                                                                                                                                                                                   | NA                                                  |     |    |
| §270.14(b)(16)                                                               | §264.144                                                                     | Post-closure cost estimate                                                                                                                                                                                            | NA                                                  |     |    |
|                                                                              | §264.145                                                                     | Post-closure care financial assurance                                                                                                                                                                                 | NA                                                  |     |    |
| §270.14(b)(17)                                                               | §264.147                                                                     | Liability insurance                                                                                                                                                                                                   | NA                                                  |     |    |
| §270.14(b)(18)                                                               | §264.149-150                                                                 | Proof of financial coverage                                                                                                                                                                                           | NA                                                  |     |    |
| §270.14(b)(19)(i),<br>(vi), (vii), and (x)                                   |                                                                              | Topographic map requirements<br>Map scale and date<br>Map orientation<br>Legal boundaries<br>Buildings<br>Treatment, storage, and disposal<br>operations<br>Run-on/run-off control systems<br>Fire control facilities | Attachment B<br>Appendix B2<br>Appendix B3          | ✓   |    |
| §270.14(b)(19)(ii)                                                           | §264.18(b)                                                                   | 100-year floodplain                                                                                                                                                                                                   | Attachment B<br>Part A                              |     | ✓  |
| §270.14(b)(19)(iii)                                                          |                                                                              | Surface waters                                                                                                                                                                                                        | Attachment B<br>Part A                              |     | ✓  |
| §270.14(b)(19)(iv)                                                           |                                                                              | Surrounding Land use                                                                                                                                                                                                  | Attachment B<br>Part A                              |     | ✓  |
| §270.14(b)(19)(v)                                                            |                                                                              | Wind rose                                                                                                                                                                                                             | Attachment B<br>Part A                              |     | ✓  |
| §270.14(b)(19)(viii)                                                         | §264.14(b)                                                                   | Access controls                                                                                                                                                                                                       | Attachment B<br>Part A                              |     | ✓  |
| §270.14(b)(19)(ix)                                                           |                                                                              | Injection and withdrawal wells                                                                                                                                                                                        | Attachment B<br>Part A                              |     | ✓  |

| Regulatory Citation(s)<br>20.4.1.900 NMAC<br>(incorporating 40 CFR Part 270) | Regulatory Citation(s)<br>20.4.1.500 NMAC<br>(incorporating 40 CFR Part 264) | Description of Requirement                                                                                                                                                                                | Added or Clarified Information                            |     |    |
|------------------------------------------------------------------------------|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|-----|----|
|                                                                              |                                                                              |                                                                                                                                                                                                           | Section of the WIPP Permit                                | Yes | No |
| §270.14(b)(19)(xi)                                                           |                                                                              | Drainage on flood control barriers                                                                                                                                                                        | Attachment B<br>Part A                                    |     | ✓  |
| §270.14(b)(19)(xii)                                                          |                                                                              | Location of operational units                                                                                                                                                                             | Attachment B<br>Part A                                    |     | ✓  |
| §270.14(b)(20)                                                               |                                                                              | Other federal laws<br>Wild and Scenic Rivers Act<br>National Historic Preservation Act<br>Endangered Species Act<br>Coastal Zone Management Act<br>Fish and Wildlife Coordination Act<br>Executive Orders | Attachment B<br>Part A                                    |     | ✓  |
| §270.15                                                                      | §264 Subpart I                                                               | Containers                                                                                                                                                                                                | Part 3<br>Part 4.3<br>Attachment A1                       |     | ✓  |
|                                                                              | §264.171                                                                     | Condition of containers                                                                                                                                                                                   | Part 3.3<br>Attachment A1                                 |     | ✓  |
|                                                                              | §264.172                                                                     | Compatibility of waste with containers                                                                                                                                                                    | Part 3.4<br>Attachment A1                                 |     | ✓  |
|                                                                              | §264.173                                                                     | Management of containers                                                                                                                                                                                  | Part 3.5<br>Attachment A1                                 |     | ✓  |
|                                                                              | §264.174                                                                     | Inspections                                                                                                                                                                                               | Part 3.7<br>Attachment E-1<br>Attachment A1-1e            |     | ✓  |
| §270.15(a)                                                                   | §264.175                                                                     | Containment systems                                                                                                                                                                                       | Part 3.6<br>Attachment A1                                 |     | ✓  |
| §270.15(c)                                                                   | §264.176                                                                     | Special requirements for ignitable or reactive waste                                                                                                                                                      | Attachment A1-1g<br>Part 2.1                              |     | ✓  |
| §270.15(d)                                                                   | §264.177                                                                     | Special requirements for incompatible wastes                                                                                                                                                              | Attachment A1-1g<br>Part 2.3.3.4                          |     | ✓  |
|                                                                              | §264.178                                                                     | Closure                                                                                                                                                                                                   | Part 6<br>Attachment G                                    |     | ✓  |
| §270.15(e)                                                                   | §264.179                                                                     | Air emission standards                                                                                                                                                                                    | Part 4.4.2<br>Attachment N                                |     | ✓  |
| §270.23                                                                      | 264 Subpart X                                                                | Miscellaneous units                                                                                                                                                                                       | Attachment A2                                             | ✓   |    |
| §270.23(a)                                                                   | §264.601                                                                     | Detailed unit description                                                                                                                                                                                 | Part 4<br>Attachment A2                                   |     | ✓  |
| §270.23(b)                                                                   | §264.601                                                                     | Hydrologic, geologic, and meteorologic assessments                                                                                                                                                        | Part 4<br>Part 5<br>Attachment A2<br>Attachment L         |     | ✓  |
| §270.23(c)                                                                   | §264.601                                                                     | Potential exposure pathways                                                                                                                                                                               | Part 4<br>Attachment A2<br>Attachment N                   |     | ✓  |
| §270.23(d)                                                                   |                                                                              | Demonstration of treatment effectiveness                                                                                                                                                                  | NA                                                        |     |    |
|                                                                              | §264.602                                                                     | Monitoring, analysis, inspection, response, reporting, and corrective action                                                                                                                              | Part 4<br>Attachment A2<br>Attachment E-1<br>Attachment N |     | ✓  |

| Regulatory Citation(s)<br>20.4.1.900 NMAC<br>(incorporating 40 CFR Part 270) | Regulatory Citation(s)<br>20.4.1.500 NMAC<br>(incorporating 40 CFR Part 264) | Description of Requirement                         | Added or Clarified Information                       |     |    |
|------------------------------------------------------------------------------|------------------------------------------------------------------------------|----------------------------------------------------|------------------------------------------------------|-----|----|
|                                                                              |                                                                              |                                                    | Section of the WIPP Permit                           | Yes | No |
|                                                                              | §264.603                                                                     | Post-closure care                                  | Attachment H<br>Attachment H1                        |     | ✓  |
|                                                                              | 264 Subpart E                                                                | Manifest system, record keeping, and reporting     | Part 1<br>Part 2.13 & 2.14<br>Part 4<br>Attachment C |     | ✓  |
|                                                                              | 264 Subpart F                                                                | Releases from solid waste management units         | Parts 5 & 7<br>Attachment G2<br>Attachment L         |     | ✓  |
|                                                                              | §264.90                                                                      | Applicability                                      | Part 5<br>Attachment L                               |     | ✓  |
|                                                                              | §264.91                                                                      | Required programs                                  | Attachment L                                         |     | ✓  |
|                                                                              | §264.92                                                                      | Ground-water protection standard                   | Attachment L                                         |     | ✓  |
|                                                                              | §264.93                                                                      | Hazardous constituents                             | Attachment L                                         |     | ✓  |
|                                                                              | §264.94                                                                      | Concentration limits                               | Part 5<br>Attachment L                               |     | ✓  |
|                                                                              | §264.95                                                                      | Point of compliance                                | Part 5<br>Attachment L                               |     | ✓  |
|                                                                              | §264.96                                                                      | Compliance period                                  | Attachment L                                         |     | ✓  |
|                                                                              | §264.97                                                                      | General ground-water monitoring requirements       | Part 5<br>Attachment L                               |     | ✓  |
|                                                                              | §264.98                                                                      | Detection monitoring program                       | Part 5<br>Attachment L                               |     | ✓  |
|                                                                              | §264.99                                                                      | Compliance monitoring program                      | Part 5<br>Attachment L                               |     | ✓  |
|                                                                              | §264.100                                                                     | Corrective action program                          | Part 5<br>Attachment L                               |     | ✓  |
|                                                                              | §264.101                                                                     | Corrective action for solid waste management units | Part 8<br>Attachment L                               |     | ✓  |
|                                                                              | §264 Appendix IX                                                             | Ground-water Monitoring List                       | Part 5<br>Attachment L                               |     | ✓  |

**Appendix A**  
**Table of Changes**

## Table of Changes

| Affected Permit Section                                                    | Explanation of Change                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Attachment A, Section A-3, <i>Property Description</i>                     | Added new sentence "A second PPA consisting of a nominal 22 acres surrounds Shaft #5." after second sentence.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Attachment A, Section A-4, <i>Facility Type</i>                            | Added new sentence "A fifth shaft, Shaft #5, located nominally 1,200 feet west of the Air Intake Shaft also connects the underground facility to the surface." after second sentence in second paragraph.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Attachment A2, List of Figures                                             | Added entries for new Figure A2-2-S#5 and Figure A2-9c to the list of figures.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Attachment A2, Section A2-1, <i>Description of the Geologic Repository</i> | <p>Added new subsection heading <i>Description of Four-Shaft Configuration</i> after the fifth paragraph.</p> <p>Added "(air pathway)"</p> <p>Added new subsection <i>Description of Five-Shaft Configuration (with Shaft #5)</i> after the sixth paragraph that includes the following text:</p> <p>"A fifth shaft, Shaft #5 (S#5), also connects the underground facility with the surface. The relationship between the WIPP surface facility, the five shafts, and the underground facility horizon is shown in Figure A2-2-S#5. With S#5 in use, the configuration of the shafts is as follows:</p> <ul style="list-style-type: none"> <li>• Shaft #5 provides the majority of the intake air for the underground facility.</li> <li>• The Air Intake Shaft provides the exhaust air pathway for the construction area of the underground facility.</li> <li>• The Waste Shaft Conveyance headframe and hoist are located within the WHB and are used to transport containers of TRU mixed waste, equipment, and materials to the repository horizon. The waste hoist can also be used to transport personnel.</li> <li>• The Waste Shaft provides intake air for the Waste Shaft Station.</li> <li>• The Salt Handling Shaft provides a portion of the ventilation for the north area of the underground facility and is also used to hoist mined salt to the surface and serve as the principle personnel transport shaft.</li> <li>• The Exhaust Shaft serves as a common exhaust air pathway for the north, disposal, and waste shaft station areas of the underground facility."</li> </ul> |
| Attachment A2, Section A2-2a(2), <i>Shafts</i>                             | <p>Added new subsection heading <i>Four-Shaft Configuration</i> before first paragraph.</p> <p>Removed hyphen between "secondary" and "supply". Replaced "duct" with "pathway". Replaced "duct" with "air pathway".</p> <p>Added new subsection <i>Five-Shaft Configuration (with Shaft #5)</i> after the second paragraph that includes the following text:</p> <p>"A fifth shaft, S#5, also extends from the surface to the repository level. With S#5 in use, it is the primary source of fresh air to the underground facility. The inside diameter of S#5 is approximately 26 ft (8 m). With S#5 in use, the ventilation functions of the existing shafts are as follows:</p> <ul style="list-style-type: none"> <li>• Salt Handling Shaft serves as a secondary supply-air pathway for the underground facility</li> <li>• The Waste Handling Shaft serves as the supply-air pathway for the Waste Shaft Station</li> <li>• The Air Intake Shaft serves as the exhaust air pathway for the construction area of the underground facility</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

| Affected Permit Section                                       | Explanation of Change                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                               | <ul style="list-style-type: none"> <li>The Exhaust Shaft serves as the exhaust air pathway for the north, disposal and waste shaft station areas of the underground facility"</li> </ul> <p>Added new subsection heading <i>General Shaft Description</i> after new subsection <i>Five-Shaft Configuration (with Shaft #5)</i>.</p> <p>Added "original four" in last sentence of first paragraph after the heading <i>General Shaft Description</i>.</p> <p>Added "or a polymeric spray coating" after lining in fourth sentence of second paragraph after the heading <i>General Shaft Description</i>.</p> <p>Added "and S#5" after Shaft in first sentence of fourth paragraph, removed space between "-" and "collection", and added "Shaft #5 is outfitted with water stops at each shaft liner cold joint throughout the lined portion of the shaft." as last sentence of fourth paragraph after the heading <i>General Shaft Description</i>.</p> <p>Added "Shaft #5 is covered to direct intake air into the underground facility using fans located on surface. The fans are connected to the shaft via ducting and a plenum." to end of sixth paragraph after the heading <i>General Shaft Description</i>.</p> <p>Added new paragraph "With S#5 in use, the Air Intake Shaft is converted to an exhaust shaft for Construction Circuit air by routing the air through a plenum and ducting to an unfiltered exhaust stack." after the sixth paragraph after the heading <i>General Shaft Description</i>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Attachment A2, Section A2-2a(3), <i>Subsurface Structures</i> | <p>Added new paragraph "With S#5 in use (Figure A2-9c), the Salt Handling Shaft serves as the secondary supply-air pathway for the underground facility while S#5 serves as the primary supply-air pathway for the underground facility. The Waste Shaft supplies the intake air for the Waste Shaft Station. The Air Intake Shaft provides the exhaust route for the Construction Circuit while the Exhaust Shaft provides the exhaust route for the North, Disposal, and Waste Shaft Station Circuits." after second paragraph under subsection <i>Underground Facilities Ventilation System</i>.</p> <p>Added new paragraph "When the repository is configured to use five shafts, two fans located on the surface and connected via ducting and a plenum to S#5, supply the majority of the intake air to the underground facility. One fan operates at a time, the idle fan is available as a back-up fan. The Salt Handling Shaft and Waste Shaft serve as secondary air intake shafts for the north area and waste shaft station areas of the underground facility. The Air Intake Shaft serves as an unfiltered exhaust shaft for the construction area of the underground facility. The north, disposal, and waste shaft station areas of the underground facility are exhausted through the Exhaust Shaft and the associated filtration system." after first paragraph under subsection <i>Underground Ventilation System Description</i>.</p> <p>Added "standard" after "minimum ventilation rate of 35,000"</p> <p>Added "When the repository is configured to use four shafts," to the first paragraph under subsection <i>Underground Ventilation Modes of Operation</i>.</p> <p>Added new paragraph "When the repository is configured to use five shafts, two intake fans located on the surface and connected to S#5 via ducting and a plenum, supply the majority of the intake air to the underground facility. The fans are designed to operate one fan at a time with the second fan available as a back-up fan. The fans have variable frequency drives that can adjust the intake flow at S#5 to meet the requirements of the underground ventilation filtration system and the Construction Circuit." after second set of bullets under subsection <i>Underground Ventilation Modes of Operation</i>.</p> |

| <b>Affected Permit Section</b>             | <b>Explanation of Change</b>                                                                                                                                                   |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Attachment A2, Figure A2-1                 | Replaced Figure A2-1 <i>Repository Horizon</i> with new figure.                                                                                                                |
| Attachment A2, Figure A2-2-S#5             | Added new Figure A2-2-S#5 <i>Spatial View of the Miscellaneous Unit and Waste Handling Facility (with S#5)</i> after Figure A2-2.                                              |
| Attachment A2, Figure A2-9c                | Added new Figure A2-9c <i>Underground Ventilation System Airflow (with S#5)</i> after Figure A2-9b.                                                                            |
| Attachment A4, Figure A4-4                 | Replaced Figure A4-4 <i>Typical Underground Transport Route Using E-140</i> with new figure.                                                                                   |
| Attachment A4, Figure A4-4a                | Replaced Figure A4-4a <i>Typical Underground Transport Route Using W-30</i> with new figure.                                                                                   |
| Attachment B, Table of Contents            | Added entry for Figure B3-1-S#5 <i>Spatial View of the WIPP Facility (with S#5)</i> to Table of Contents, Appendix B3 Facilities.                                              |
| Attachment B, Appendix B2, Figure B2-2     | Replaced Figure B2-2 <i>Planimetric Map-WIPP Facility Boundaries</i> with new figure.                                                                                          |
| Attachment B, Appendix B2, Figure B2-2a    | Replaced Figure B2-2a <i>Legend to Figure B2-2</i> with new figure.                                                                                                            |
| Attachment B, Appendix B3, Figure B3-1-S#5 | Added new Figure B3-1-S#5 <i>Spatial View of the WIPP Facility (with S#5)</i> after Figure B3-1.                                                                               |
| Attachment B, Appendix B3, Figure B3-2     | Replaced Figure B3-2 <i>Repository Horizon</i> with new figure.                                                                                                                |
| Attachment D, List of Figures              | Added entries for Figure D-2-S#5 <i>Spatial View of the WIPP Facility (with S#5)</i> and Figure D-5-S#5 <i>Fire-Water Distribution System (with S#5)</i> to Table of Contents. |
| Attachment D, Figure D-2-S#5               | Added new Figure D-2-S#5 <i>Spatial View of the WIPP Facility (with S#5)</i> after Figure D-2.                                                                                 |
| Attachment D, Figure D-3                   | Replaced Figure D-3 <i>WIPP Underground Facilities</i> with new figure.                                                                                                        |
| Attachment D, Figure D-5                   | Replaced Figure D-5 <i>Fire-Water Distribution System</i> with new figure.                                                                                                     |
| Attachment D, Figure D-5-S#5               | Added new Figure D-5-S#5 <i>Fire-Water Distribution System (with S#5)</i> after Figure D-5.                                                                                    |
| Attachment D, Figure D-7                   | Replaced Figure D-7 <i>Designated Underground Assembly Areas</i> with new figure.                                                                                              |
| Attachment D, Figure D-8                   | Replaced Figure D-8 <i>WIPP Site Evacuation Routes</i> with new figure.                                                                                                        |
| Attachment G, <i>Introduction</i>          | Deleted “the four” before shaft and added “for each shaft” after systems in first paragraph of the introduction.                                                               |
| Attachment G, Figure G-1                   | Replaced Figure G-1 <i>Location of Underground HWDUs and Anticipated Closure Locations</i> with new figure.                                                                    |
| Attachment G, Figure G-6                   | Replaced Figure G-6 <i>Approximate Locations of Boreholes in Relation to the WIPP Underground</i> with new figure.                                                             |

**Appendix B**  
**Proposed Revised Permit Text**

**Proposed Revised Permit Text:**

**ATTACHMENT A**

**GENERAL FACILITY DESCRIPTION AND  
PROCESS INFORMATION**

**A-3 Property Description**

The WIPP property has been divided into functional areas. The Property Protection Area (**PPA**), surrounded by a chain-link security fence, encompasses 34.16 acres and provides security and protection for all major surface structures. A second PPA consisting of a nominal 22 acres surrounds Shaft #5. The DOE Off Limits Area encloses the PPA, and is approximately 1,454 acres. These areas define the DOE exclusion zone within which certain items and material are prohibited. The final zone is marked by the WIPP Site Boundary (WIPP Land Withdrawal Area), a 16-section Federal land area under the jurisdiction of the DOE.

**A-4 Facility Type**

There are three basic groups of structures associated with the WIPP facility: surface structures, shafts and underground structures. The surface structures accommodate the personnel, equipment, and support services required for the receipt, preparation, and transfer of TRU mixed waste from the surface to the underground. There are two surface locations where TRU mixed waste is managed and stored. The first area is the Waste Handling Building (**WHB**) Container Storage Unit (**WHB Unit**) for TRU mixed waste management and storage. The WHB Unit consists of the WHB contact-handled (**CH**) Bay and the remote-handled (**RH**) Complex. The second area designated for managing and storing TRU mixed waste is the Parking Area Container Storage Unit (**Parking Area Unit**), an outside container storage area which extends south from the WHB to the rail siding. The Parking Area Unit provides storage space for up to 50 loaded Contact-Handled Packages and 14 loaded Remote-Handled Packages on an asphalt and concrete surface. Part 3 of the permit authorizes the storage and management of CH and RH TRU mixed waste containers in these two surface locations. The technical requirements of 20.4.1.500 NMAC (incorporating 40 CFR §§264.170 to 264.178) are applied to the operation of the WHB Unit and the Parking Area Unit. Permit Attachment A1 describes the container storage units, the TRU mixed waste management facilities and operations, and compliance with the technical requirements of 20.4.1.500 NMAC.

Four vertical shafts connect the surface facility to the underground. These are the Waste Shaft, the Salt Handling Shaft, the Exhaust Shaft and the Air Intake Shaft. A fifth shaft, Shaft #5, located nominally 1,200 feet west of the Air Intake Shaft also connects the underground facility to the surface. The Waste Shaft is the only shaft used to transport TRU mixed waste to the underground. The WIPP underground structures are located in a mined salt bed 2,150 feet below the surface.

The WIPP is a geologic repository mined within a bedded salt formation, which is defined in 20.4.1.100 NMAC (incorporating 40 CFR §260.10) as a miscellaneous unit. As such, hazardous waste management units within the repository are subject to permitting according to 20.4.1.900 and .901 NMAC (incorporating 40 CFR §270), and are regulated under 20.4.1.500 NMAC, Miscellaneous Units.

## ATTACHMENT A2

### GEOLOGIC REPOSITORY

#### LIST OF TABLES

| Table      | Title                                                                  |
|------------|------------------------------------------------------------------------|
| Table A2-1 | CH TRU Mixed Waste Handling Equipment Capacities                       |
| Table A2-2 | Instrumentation Used in Support of the Geomechanical Monitoring System |
| Table A2-3 | RH TRU Mixed Waste Handling Equipment Capacities                       |

#### LIST OF FIGURES

| Figure                                 | Title                                                                                                |
|----------------------------------------|------------------------------------------------------------------------------------------------------|
| Figure A2-1                            | Repository Horizon                                                                                   |
| Figure A2-2                            | Spatial View of the Miscellaneous Unit and Waste Handling Facility                                   |
| <a href="#"><u>Figure A2-2-S#5</u></a> | <a href="#"><u>Spatial View of the Miscellaneous Unit and Waste Handling Facility (with S#5)</u></a> |
| Figure A2-3                            | Facility Pallet for Seven-Pack of Drums                                                              |
| Figure A2-5                            | Typical Backfill Sacks Emplaced on Drum Stacks                                                       |
| Figure A2-5a                           | Potential MgO Emplacement Configurations                                                             |
| Figure A2-6                            | Waste Transfer Cage to Transporter                                                                   |
| Figure A2-7                            | Push-Pull Attachment to Forklift to Allow Handling of Waste Containers                               |
| Figure A2-8                            | Typical RH and CH Transuranic Mixed Waste Container Disposal Configuration                           |
| Figure A2-9a                           | Underground Ventilation System Airflow                                                               |
| Figure A2-9b                           | Underground Ventilation System Airflow (with SVS)                                                    |
| <a href="#"><u>Figure A2-9c</u></a>    | <a href="#"><u>Underground Ventilation System Airflow (with S#5)</u></a>                             |
| Figure A2-11                           | Typical Room Barricade                                                                               |
| Figure A2-11a                          | Typical Bulkhead                                                                                     |
| Figure A2-12                           | WIPP Facility Surface and Underground CH Transuranic Mixed Waste Process Flow Diagram                |
| Figure A2-12                           | WIPP Facility Surface and Underground CH Transuranic Mixed Waste Process Flow Diagram (Continued)    |
| Figure A2-13                           | Layout and Instrumentation - As of 1/96                                                              |
| Figure A2-14                           | Facility Cask Transfer Car (Side View)                                                               |
| Figure A2-15                           | Typical Horizontal Emplacement Equipment                                                             |
| Figure A2-15a                          | Typical Horizontal Emplacement Equipment                                                             |
| Figure A2-16                           | RH TRU Waste Facility Cask Unloading from Waste Shaft Conveyance                                     |
| Figure A2-17                           | Facility Cask Installed on the Typical Emplacement Equipment                                         |
| Figure A2-18                           | Installing Shield Plug                                                                               |
| Figure A2-19                           | Shield Plug Supplemental Shielding Plate(s)                                                          |
| Figure A2-20                           | Shielding Layers to Supplement RH Borehole Shield Plugs                                              |
| Figure A2-21                           | Shield Plug Configuration                                                                            |

## A2-1 Description of the Geologic Repository

Management, storage, and disposal of transuranic (**TRU**) mixed waste in the Waste Isolation Pilot Plant (**WIPP**) geologic repository is subject to regulation under 20.4.1.500 NMAC. The WIPP is a geologic repository mined within a bedded salt formation, which is defined in 20.4.1.101 NMAC (incorporating 40 CFR §260.10) as a miscellaneous unit. As such, HWMUs within the repository are eligible for permitting according to 20.4.1.101 NMAC (incorporating 40 CFR §260.10), and are regulated under 20.4.1.500 NMAC, Miscellaneous Units.

As required by 20.4.1.500 NMAC (incorporating 40 CFR §264.601), the Permittees shall ensure that the environmental performance standards for a miscellaneous unit, which are applied to the Underground Hazardous Waste Disposal Units (**HWDUs**) in the geologic repository, will be met.

The Disposal Phase will consist of receiving contact-handled (**CH**) and remote-handled (**RH**) TRU mixed waste shipping containers, unloading and transporting the waste containers to the Underground HWDUs, emplacing the waste in the Underground HWDUs, and subsequently achieving closure of the Underground HWDUs in compliance with applicable State and Federal regulations.

The WIPP geologic repository is mined within a 2,000-feet (ft) (610-meters (m))-thick bedded-salt formation called the Salado Formation. The Underground HWDUs (miscellaneous units) are located 2,150 ft (655 m) beneath the ground surface. TRU mixed waste management activities underground will be confined to the southern portion of the 120-acre (48.6 hectares) mined area during the Disposal Phase. During the term of this Permit, disposal of TRU mixed waste will occur only in the HWDUs designated as Panels 5 through 8 and in any currently active panel (See Figure A2-1). RH TRU mixed waste disposal began in Panel 4. The Permittees may also request in the future a Permit to allow disposal of containers of TRU mixed waste in the areas designated as Panels 9 and 10 in Figure A2-1. This Permit, during its 10-year term, authorizes the excavation of Panels 6 through 10 and the disposal of waste in Panels 1 through 8.

Panels 1 through 8 will consist of seven rooms and two access drifts each. Panels 9 and 10 have yet to be designed. Access drifts connect the rooms and have the same cross section (see Section A2-2a(3)). The closure system installed in each HWDU after it is filled will prevent anyone from entering the HWDU and will restrict ventilation airflow. The point of compliance for air emissions from the Underground is Sampling Station VOC-C, as defined in Permit Attachment N (Volatile Organic Compound Monitoring Plan). Sampling Station VOC-C is the location where the concentration of volatile organic compounds (VOCs) in the air emissions from the Underground HWDUs will be measured and then compared to the VOC action levels ( $10^{-5}$  for carcinogens and  $HI > 1$  for non-carcinogens) as required by Permit Part 4, Section 4.6.2.3.

### Description of Four-Shaft Configuration

Four shafts connect the underground area with the surface. The Waste Shaft Conveyance headframe and hoist are located within the Waste Handling Building (**WHB**) and will be used to transport containers of TRU mixed waste, equipment, and materials to the repository horizon. The waste hoist can also be used to transport personnel. The Air Intake Shaft and the Salt Handling Shaft provide ventilation to all areas of the mine except for the Waste Shaft Station. This area is ventilated by the Waste Shaft itself. The Salt Handling Shaft is also used to hoist mined salt to the surface and serves as the principal personnel transport shaft. The Exhaust Shaft serves as a common exhaust air duct (air pathway) for all areas of the mine. In some

cases (such as during mining activities), the Salt Handling Shaft will be used as an unfiltered exhaust shaft. The Salt Shaft exhaust air will come from the North or Construction Circuits (i.e., areas of the underground that are not contaminated and do not need High-Efficiency Particulate Air (HEPA) filtration). The relationship between the WIPP surface facility, the four shafts, and the geologic repository horizon is shown on Figure A2-2.

#### Description of Five-Shaft Configuration (with Shaft #5)

A fifth shaft, Shaft #5 (S#5), also connects the underground facility with the surface. The relationship between the WIPP surface facility, the five shafts, and the underground facility horizon is shown in Figure A2-2-S#5. With S#5 in use, the configuration of the shafts is as follows:

- Shaft #5 provides the majority of the intake air for the underground facility.
- The Air Intake Shaft provides the exhaust air pathway for the construction area of the underground facility.
- The Waste Shaft Conveyance headframe and hoist are located within the WHB and are used to transport containers of TRU mixed waste, equipment, and materials to the repository horizon. The waste hoist can also be used to transport personnel.
- The Waste Shaft provides intake air for the Waste Shaft Station.
- The Salt Handling Shaft provides a portion of the ventilation for the north area of the underground facility and is also used to hoist mined salt to the surface and serve as the principle personnel transport shaft.
- The Exhaust Shaft serves as a common exhaust air pathway for the north, disposal, and waste shaft station areas of the underground facility.

The HWDUs identified as Panels 1 through 8 (Figure A2-1) provide room for up to 5,244,900 cubic feet (ft<sup>3</sup>) (148,500 cubic meters (m<sup>3</sup>)) of CH TRU mixed waste. The CH TRU mixed waste containers may be stacked up to three high across the width of the room.

### A2-2 Geologic Repository Design and Process Description

#### A2-2a Geologic Repository Design and Construction

##### A2-2a(2) Shafts

#### Four-Shaft Configuration

The WIPP facility uses four shafts: the Waste Shaft, the Salt Handling Shaft, the Air Intake Shaft, and the Exhaust Shaft. These shafts are vertical openings that extend from the surface to the repository level.

The Waste Shaft is located beneath the WHB and is 19 to 20 ft (5.8 to 6.1 m) in diameter. The Salt Handling Shaft, located north of the Waste Shaft beneath the salt handling headframe, is 10 to 12 ft (3 to 3.6 m) in diameter. Salt mined from the repository horizon is removed through the Salt Handling Shaft. The Salt Handling Shaft is the main personnel and materials hoist and also serves as a secondary ~~supply-air duct~~ pathway for the underground areas. The Air Intake Shaft, northwest of the WHB, varies in diameter from 16 ft 7 in. (4.51 m) to 20 ft 3 in. (6.19 m) and is the primary source of fresh air underground. The Exhaust Shaft, east of the WHB, is 14 to 15 ft (4.3 to 4.6 m) in diameter and serves as the exhaust ~~duct~~ air pathway for the underground air. In some cases, the Salt Handling Shaft may be used as an unfiltered exhaust shaft to ventilate areas of the underground that do not need filtration.

#### Five-Shaft Configuration (with S#5)

A fifth shaft, S#5, also extends from the surface to the repository level. With S#5 in use, it is the primary source of fresh air to the underground facility. The inside diameter of S#5 is approximately 26 ft (8 m). With S#5 in use, the ventilation functions of the existing shafts are as follows:

- Salt Handling Shaft serves as a secondary supply-air (intake air) pathway for the underground facility
- The Waste Shaft serves as the supply-air (intake air) pathway for the Waste Shaft Station
- The Air Intake Shaft serves as the exhaust air pathway for the construction area of the underground facility
- The Exhaust Shaft serves as the exhaust air pathway for the north, disposal and waste shaft station areas of the underground facility

#### General Shaft Description

Openings excavated in salt experience closure because of salt creep (or time-dependent deformation at constant load). The closure affects the design of all of the openings discussed in this section. Underground excavation dimensions, therefore, are nominal, because they change with time. The unlined portions of the shafts have larger diameters than the lined portions, which allows for closure caused by salt creep. Each shaft includes a shaft collar, a shaft lining, and a shaft key section. The Final Design Validation Report in Appendix D1 of the WIPP RCRA Part B Permit Application (DOE, 1997) discusses the original four shafts and shaft components in greater detail.

The reinforced-concrete shaft collars extend from the surface to the top of the underlying consolidated sediments. Each collar serves to retain adjacent unconsolidated sands and soils and to prevent surface runoff from entering the shafts. The shaft linings extend from the base of the collar to the top of the salt beds approximately 850 ft (259 m) below the surface. Grout injected behind the shaft lining or a polymeric spray coating retards water seeping into the shafts from water-bearing formations, and the liner is designed to withstand the natural water pressure associated with these formations. The shaft liners are concrete, except in the Salt Handling Shaft, where a steel shaft liner has been grouted in place.

The shaft key is a circular reinforced concrete section emplaced in each shaft below the liner in the base of the Rustler and extending about 50 ft (15 m) into the Salado. The key functions to resist lateral pressures and assures that the liner will not separate from the host rocks or fail under tension. This design feature also aids in preventing the shaft from becoming a route for groundwater flow into the underground facility.

On the inside surface of each shaft, excluding the Salt Handling Shaft and S#5, there are three water-collection rings: one just below the Magenta, one just below the Culebra, and one at the lowermost part of the key section. These collection rings will collect water that may seep into the shaft through the liner. The Salt Handling Shaft has a single water collection ring in the lower part of the key section. Water collection rings are drained by tubes to the base of the shafts where the water is accumulated. Shaft #5 is outfitted with water stops at each shaft liner cold joint throughout the lined portion of the shaft.

WIPP shafts and other underground facilities are, for all practical purposes, dry. Minor quantities of water (which accumulate in some shaft sumps) are insufficient to affect the waste disposal area. This water is collected, brought to the surface, and disposed of in accordance with current standards and regulations.

The Waste Shaft is protected from precipitation by the roof of the waste shaft conveyance headframe tower. The Exhaust Shaft is configured at the top with a 14 ft- (4.3 m-) diameter duct that diverts air into the exhaust filtration system or to the atmosphere, as appropriate. The Salt Handling and Air Intake Shaft collars are open except for the headframes. Rainfall into the shafts is evaporated by ventilation air. Shaft #5 is covered to direct intake air into the underground facility using fans located on the surface. The fans are connected to the shaft via ducting and a plenum.

With S#5 in use, the Air Intake Shaft is converted to an exhaust shaft for Construction Circuit air by routing the air through a plenum and ducting to an unfiltered exhaust stack.

The waste hoist system in the Waste Shaft and all Waste Shaft furnishings are designed to resist the dynamic forces of the hoisting system, which are greater than the seismic forces on the underground facilities. In addition the Waste Shaft conveyance headframe is designed to withstand the design-basis earthquake (DBE). Maximum operating speed of the hoist is 500 ft (152.4 m) per minute. During loading and unloading operations, the waste hoist is steadied by fixed guides. The waste hoist is equipped with a control system that will detect malfunctions or abnormal operations of the hoist system, such as overtravel, overspeed, power loss, or circuitry failure. The control response is to annunciate the condition and shut the hoist down. Operator response is required to recover from the automatic shutdown. Waste hoist operation is continuously monitored by the CMS. A battery powered FM transmitter/receiver allows communication between the hoist conveyance and the hoist house.

#### A2-2a(3) Subsurface Structures

#### Underground Facilities Ventilation System

The underground facilities ventilation system will provide a safe and suitable environment for underground operations during normal WIPP facility operations. The underground system is

designed to provide control of potential airborne contaminants in the event of an accidental release or an underground fire.

The underground is divided into specific areas that are supported by different ventilation flows referred to as ventilation circuits. Consequently, the underground ventilation system is comprised of four separate circuits, as designated on Figure A2-9a: one serving the northern experimental areas (North Circuit), one serving the construction areas (Construction Circuit), one serving the waste disposal areas (Disposal Circuit), and one serving the waste shaft station area (Waste Shaft Station Circuit). The four circuits are recombined near the bottom of the Exhaust Shaft, which serves as a common exhaust route from the underground level to the surface. In some cases, the Salt Handling Shaft may be used as an unfiltered exhaust shaft (Figure A2-9b) to ventilate areas of the underground that do not need filtration.

With S#5 in use (Figure A2-9c), the Salt Handling Shaft serves as the secondary supply-air pathway for the underground facility while S#5 serves as the primary supply-air pathway for the underground facility. The Waste Shaft supplies the intake air for the Waste Shaft Station. The Air Intake Shaft provides the exhaust route for the Construction Circuit while the Exhaust Shaft provides the exhaust route for the North, Disposal, and Waste Shaft Station Circuits.

#### Underground Ventilation System Description

The underground ventilation system consists of centrifugal exhaust fans, two identical HEPA-filter assemblies arranged in parallel, isolation dampers, a filter bypass arrangement, two skid-mounted HEPA-filter assemblies arranged in parallel, and associated ductwork. The fans, connected by the ductwork to the underground exhaust shaft so that they can independently draw air through the Exhaust Shaft, are divided into three groups. One group consists of three main exhaust fans, two of which are utilized to provide the nominal air flow of 425,000 standard ft<sup>3</sup> per minute (**scfm**) throughout the WIPP facility underground during normal (unfiltered) operation. One main fan may be operated in the alternate mode to provide 260,000 scfm underground ventilation flow. These fans are located near the Exhaust Shaft. The second group consists of three filtration fans, and each can provide 60,000 scfm of air flow. These fans, located at the Exhaust Filter Building, can be operated in the filtration mode, where exhaust is diverted through HEPA filters, or in the reduced or minimum ventilation mode, where air is not drawn through the HEPA filters. The third group consists of two skid-mounted filtration fans and HEPA-filter assemblies, each of which can provide approximately 23,000 scfm of air flow. The skid-mounted filtration fan and HEPA-filter assemblies, referred to as the Interim Ventilation System (**IVS**) located south of the Exhaust Filter Building, are only operated in filtration mode, where exhaust is diverted through HEPA filters. In addition to the surface fans, an underground fan has been installed to ventilate uncontaminated areas in the North and Construction Circuits. This system is referred to as the Supplemental Ventilation System (**SVS**) and will be used in conjunction with IVS (as shown in Figure A2-9b). When this fan is operating, the Salt Shaft will serve as an unfiltered exhaust shaft for the North and Construction Circuits. A portion of the airflow provided by the SVS to the Construction Circuit can also be used to provide fresh air to the Disposal Circuit, if needed. In this case, the air from the Disposal Circuit will continue to be exhausted through the HEPA filtration system.

When the repository is configured to use five shafts, two fans located on the surface and connected via ducting and a plenum to S#5, supply the majority of the intake air to the underground facility. One fan operates at a time, while the idle fan is available as a back-up fan. The Salt Handling Shaft and Waste Shaft serve as secondary air intake shafts for the north area and waste shaft station areas of the underground facility. The Air Intake Shaft serves as an

unfiltered exhaust shaft for the construction area of the underground facility. The north, disposal, and waste shaft station areas of the underground facility are exhausted through the Exhaust Shaft and the associated filtration system.

The underground mine ventilation is designed to supply sufficient quantities of air to all areas of the repository. During normal operating mode (simultaneous mining and waste emplacement operations), approximately 140,000 actual ft<sup>3</sup> (3,962 m<sup>3</sup>) per min can be supplied to the panel area. This quantity is necessary in order to support the level of activity and the pieces of diesel equipment that are expected to be in operation.

At any given time during waste emplacement activities, there may be significant activities in multiple rooms in a panel. For example, one room may be receiving CH TRU mixed waste containers, another room may be receiving RH TRU mixed waste canisters, and the drilling of RH TRU mixed waste emplacement boreholes may be occurring in another room. The remaining rooms in a panel will either be completely filled with waste; be idle, awaiting waste handling operations; or being prepared for waste receipt. A minimum ventilation rate of 35,000 standard ft<sup>3</sup> (990 m<sup>3</sup>) per minute will be maintained in each active room when waste disposal is taking place and workers are present in the room. This quantity of air is required to support the numbers and types of diesel equipment that are expected to be in operation in the area, and to support the underground personnel working in that area. The remainder of the air is needed in order to account for air leakage through inactive rooms. If an active room ventilation rate of 35,000 scfm cannot be met, actions as described in Permit Attachment O shall be taken during waste disposal operations when workers are present.

#### Underground Ventilation Modes of Operation

When the repository is configured to use four shafts, the underground ventilation system is designed to perform under three types of operation: normal (the HEPA exhaust filtration system is bypassed), filtered (the exhaust is filtered through the HEPA filtration system), if radioactive contaminants are detected or suspected, or a combined mode in which the air in the Disposal Circuit is filtered and the air in the North and Construction Circuits is unfiltered.

The possible modes of exhaust fan operation are as follows:

- 2 main fans in operation
- 1 main fan in operation
- 1 filtration fan in filtered operation
- 2 fans in filtered operation (one filtration fan and one IVS fan or two IVS fans)
- 3 fans in filtered operation (one filtration fan and two IVS fans)
- 1 filtration fan in unfiltered operation
- 2 filtration fans in unfiltered operation
- 1 main and 1 filtration fan in unfiltered operation
- 3 fans in filtered operation (one filtration fan and two IVS fans exhausting through the Exhaust Shaft) and an underground SVS fan in operation (boosting fresh air into the mine causing the Salt Handling Shaft to serve as an unfiltered exhaust shaft for the North and Construction Circuits)

Under some circumstances (such as power outages and maintenance activities, etc.), all mine ventilation may be discontinued for short periods of time.

In the normal mode, two main surface exhaust fans, located near the Exhaust Shaft, will provide continuous ventilation of the underground areas. In this mode, underground flows join at the bottom of the Exhaust Shaft before discharge to the atmosphere. However, in some cases, the Salt Handling Shaft may be used as an unfiltered exhaust shaft to ventilate areas of the underground that do not need filtration.

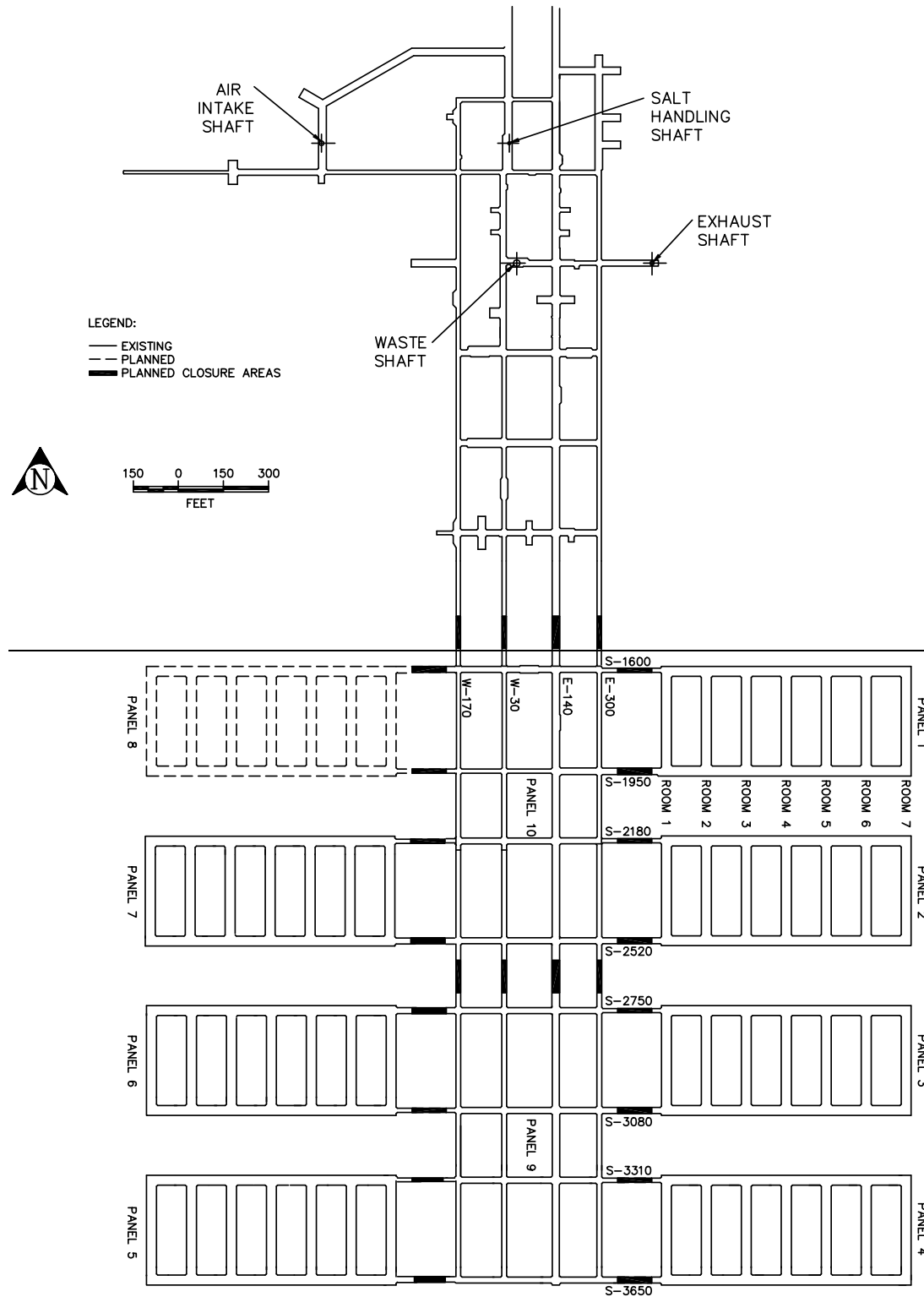
Typically, outside air will be supplied to the construction areas and the waste disposal areas through the Air Intake Shaft, the Salt Handling Shaft, and access entries. A small quantity of outside air will flow down the Waste Shaft to ventilate the Waste Shaft station. The ventilation system is designed to operate with the Air Intake Shaft as the primary source of fresh air. Under these circumstances, sufficient air will be available to simultaneously conduct all underground operations (e.g., waste handling, mining, experimentation, and support). Ventilation may be supplied by operating fans in the configurations listed in the above description of the ventilation modes.

An underground SVS fan, located in the S-90 drift, provides additional ventilation to the underground facility, as needed. The SVS ventilates the following:

- The North and Construction Circuits, exhausting through the Salt Handling Shaft and
- The disposal areas of the underground, exhausting through the Exhaust Shaft and through the filtration system

When the repository is configured to use five shafts, two intake fans located on the surface and connected to S#5 via ducting and a plenum, supply the majority of the intake air to the underground facility. The fans are designed to operate one fan at a time with the second fan available as a back-up fan. The fans have variable frequency drives that can adjust the intake flow at S#5 to meet the requirements of the underground ventilation filtration system and the Construction Circuit.

If the nominal flow of 425,000 scfm (12,028 m<sup>3</sup>/min) is not available (e.g., only one of the main ventilation fans is available) underground operations may proceed, but the number of activities that can be performed in parallel may be limited depending on the quantity of air available. Ventilation may be supplied by operating one or more of the filtration exhaust fans. To accomplish this, the isolation dampers will be opened, which will permit air to flow from the main exhaust duct to the filter outlet plenum or to the IVS. The filtration fans may also be operated to bypass the HEPA plenum. The isolation dampers of the filtration exhaust fan(s) to be employed will be opened, and the selected fan(s) will be switched on. In this mode, underground operations will be limited, because filtration exhaust fans cannot provide sufficient airflow to support the use of diesel equipment.



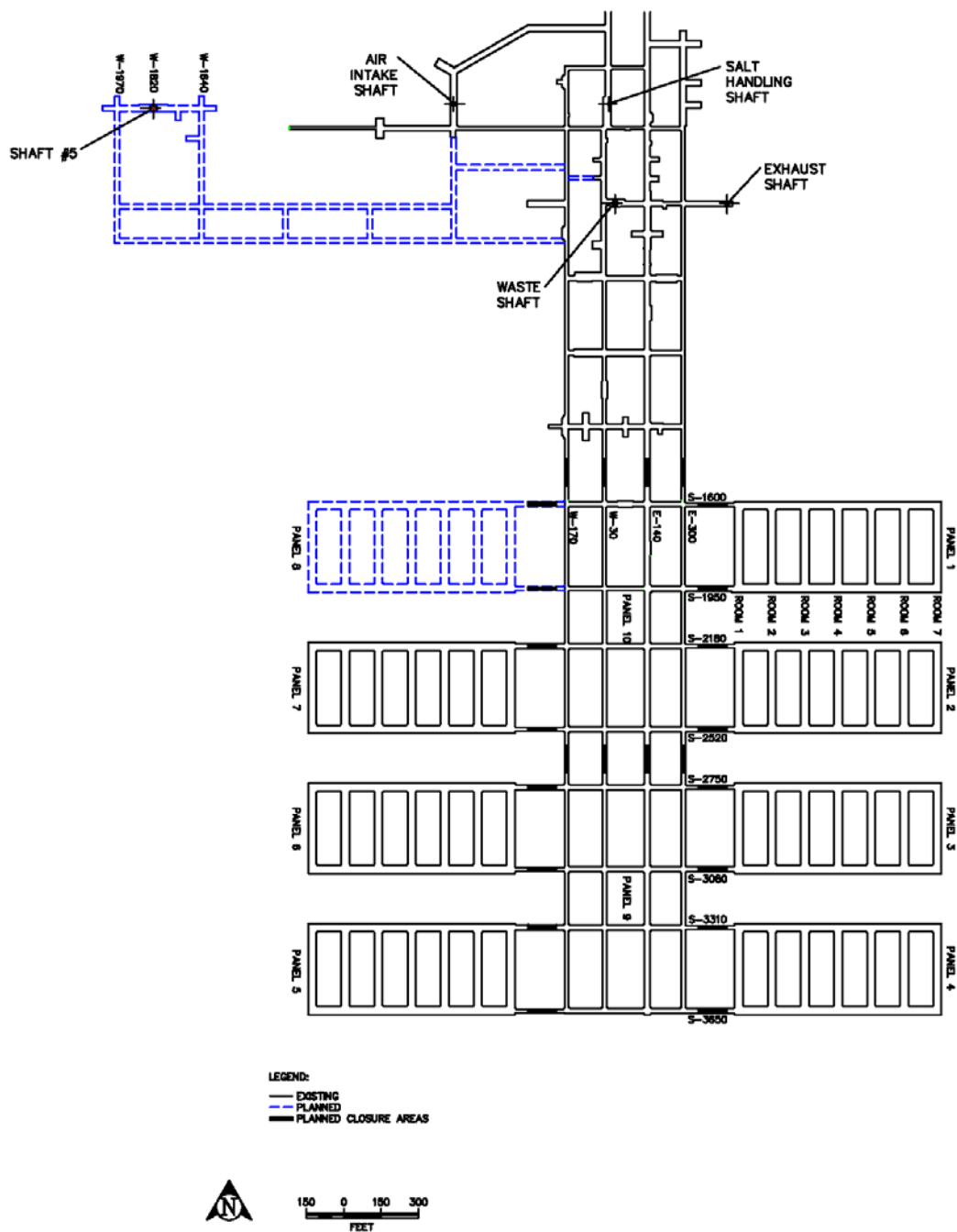
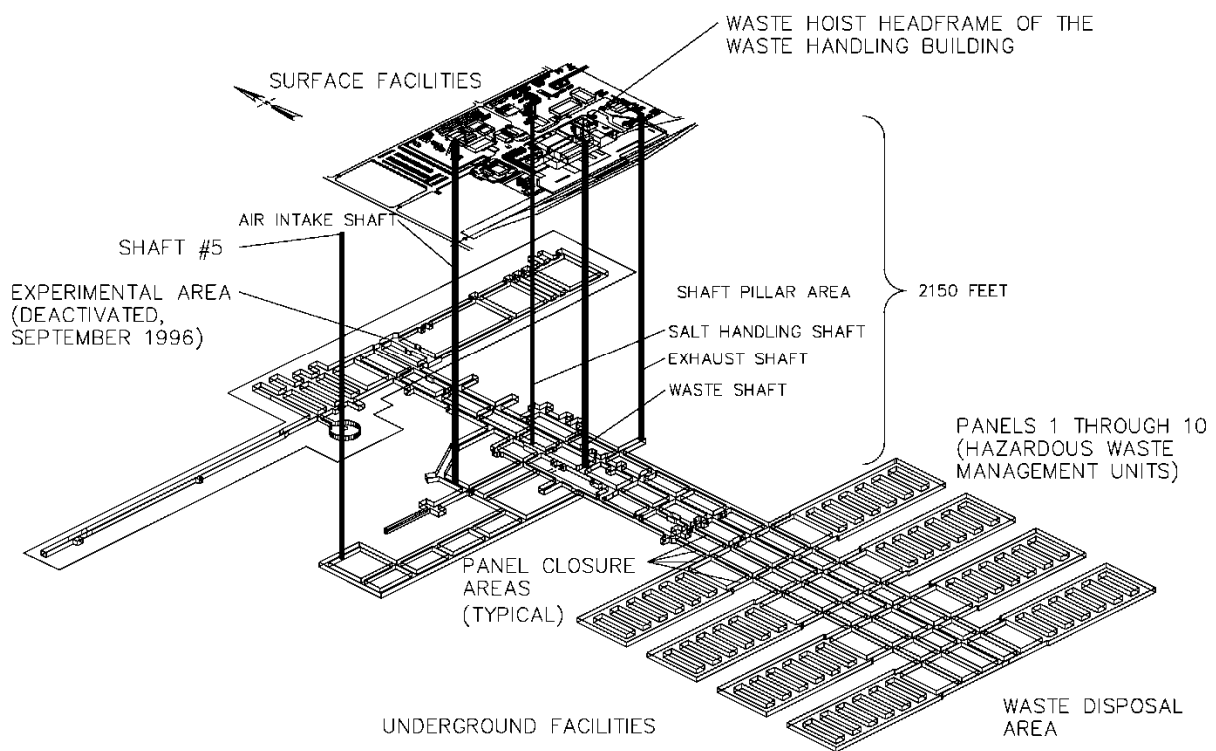
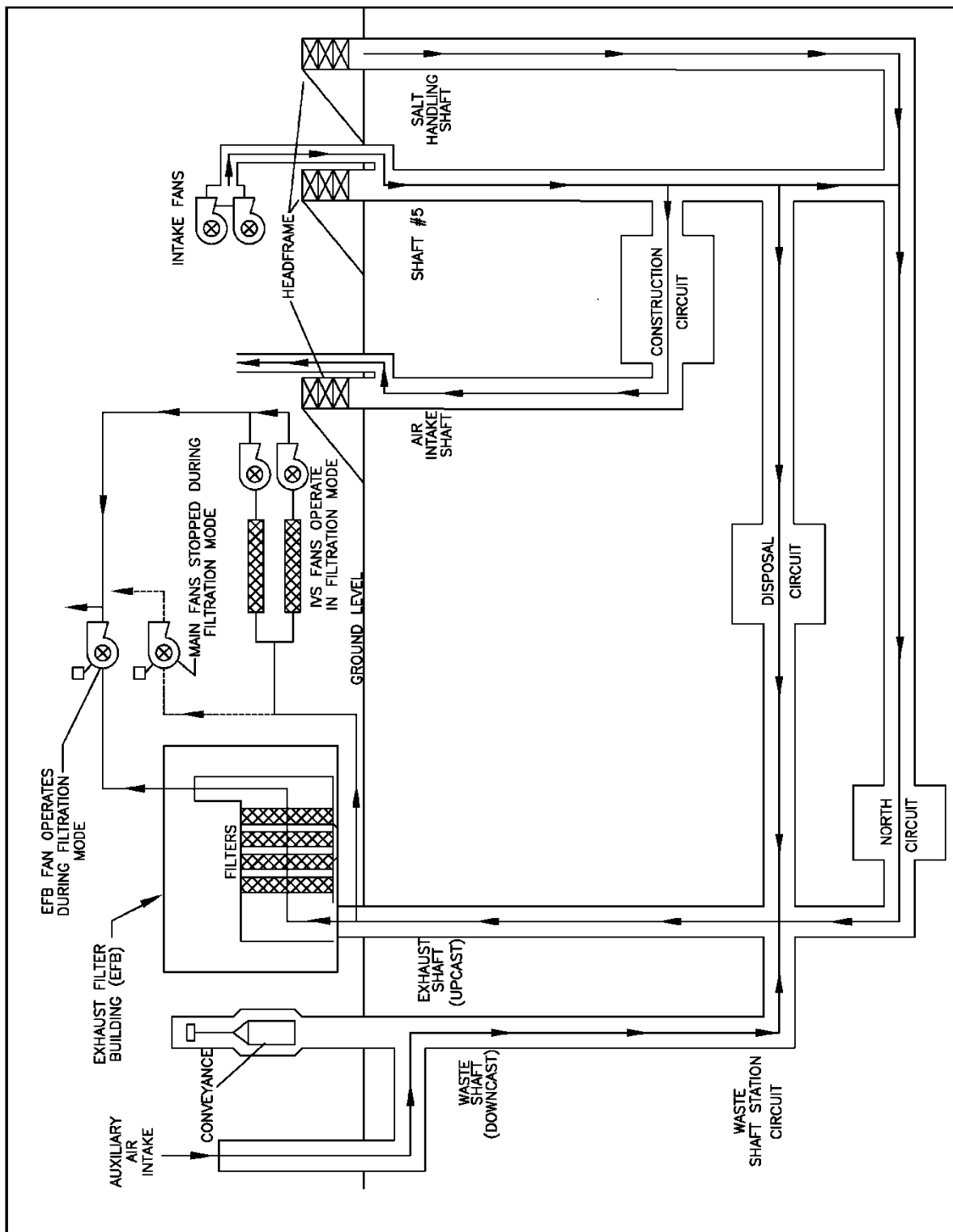


Figure A2-1  
Repository Horizon

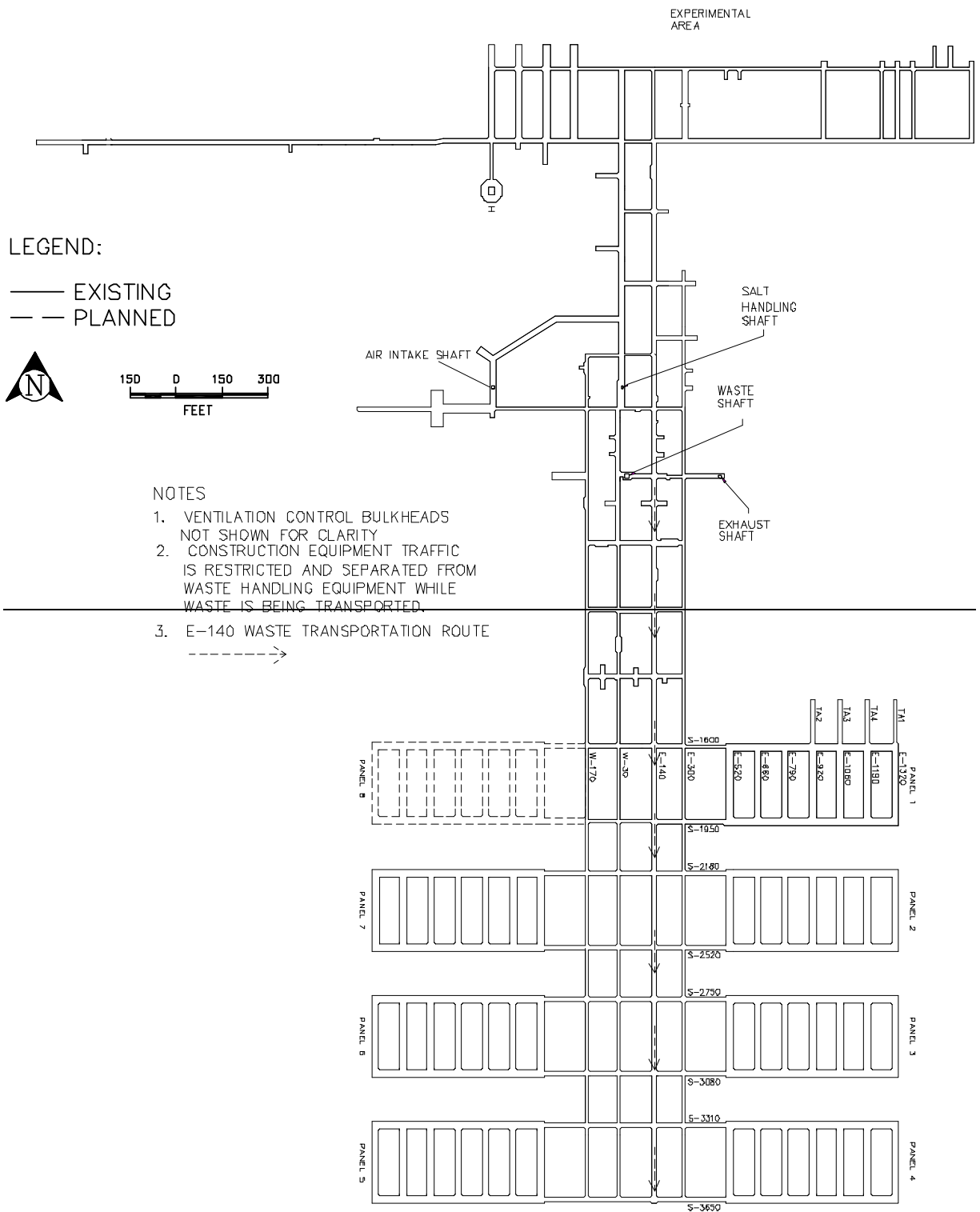


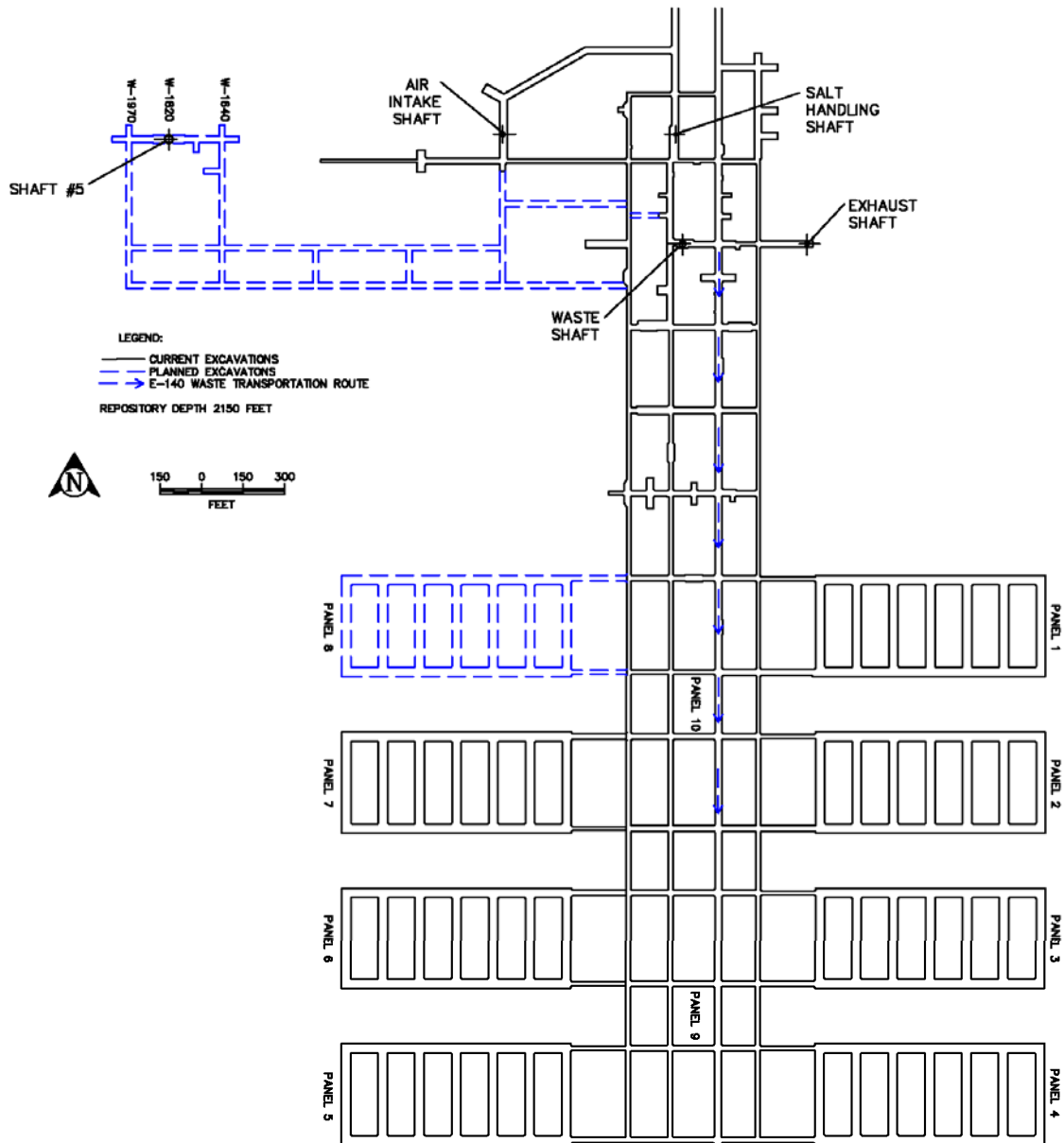
**Figure A2-2-S#5**  
**Spatial View of the Miscellaneous Unit and Waste Handling Facility (with S#5)**



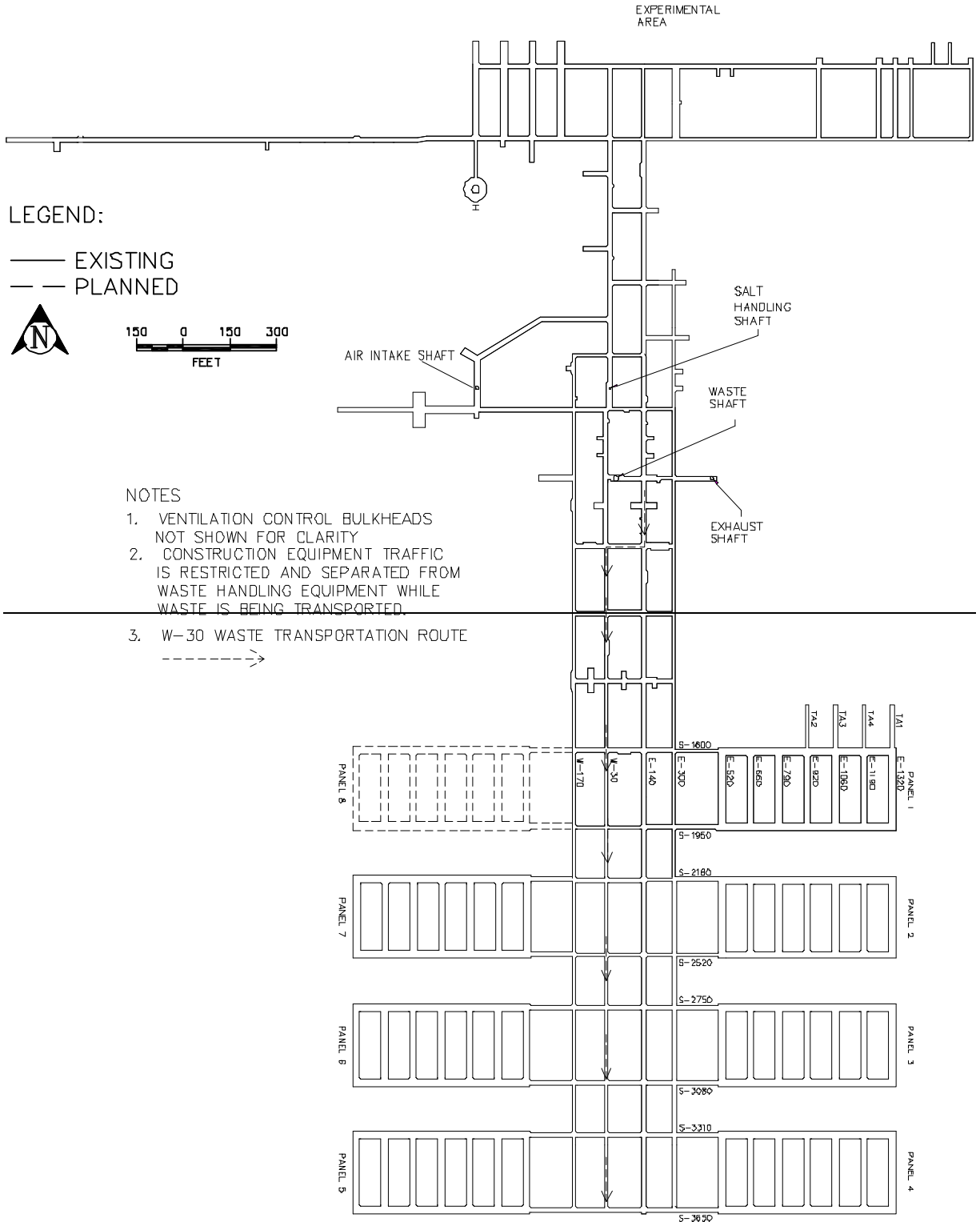
**Figure A2-9c**  
**Underground Ventilation System Airflow (with S#5)**

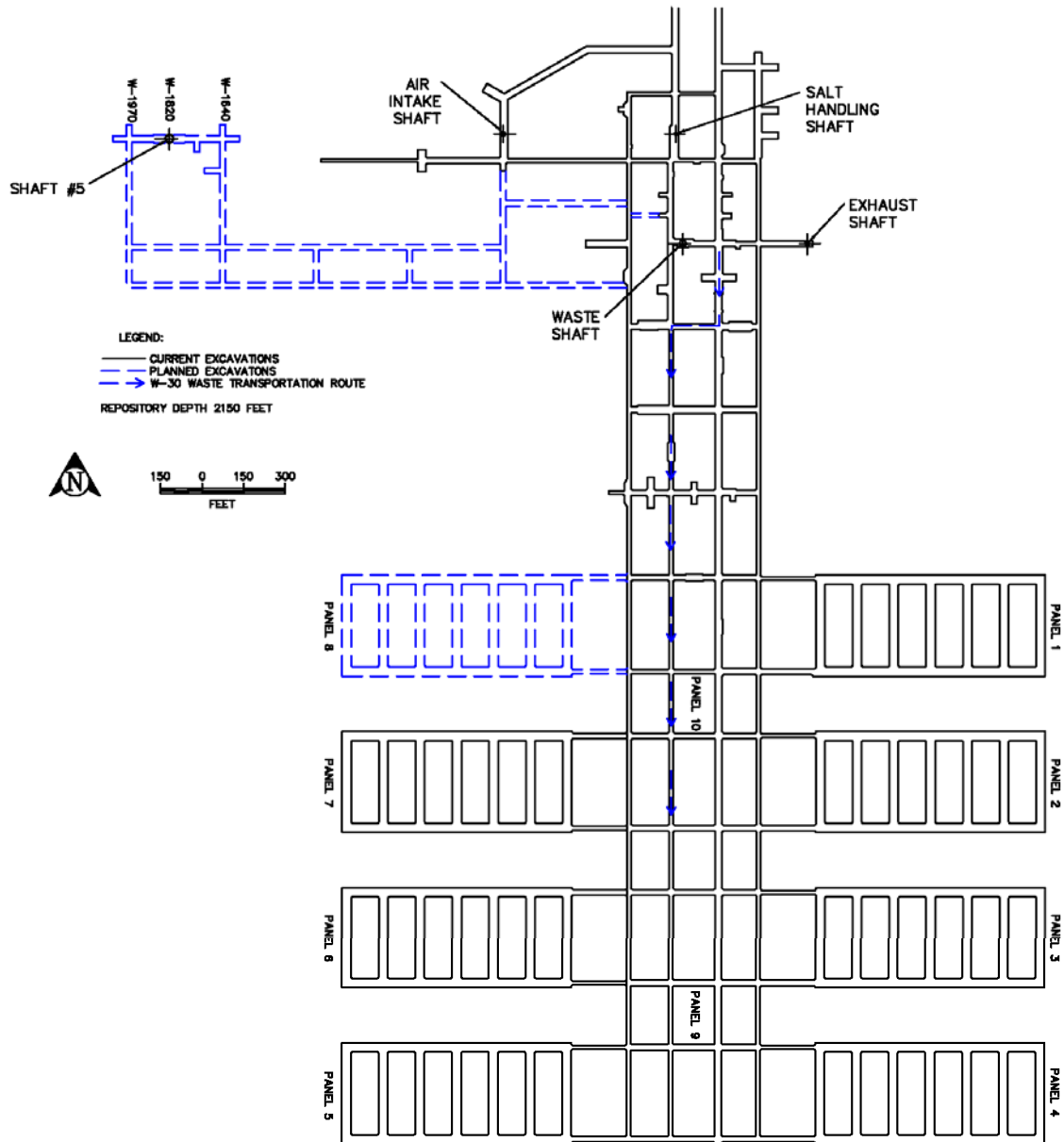
**ATTACHMENT A4**  
**TRAFFIC PATTERNS**





**Figure A4-4**  
**Typical Underground Transport Route Using E-140**





**Figure A4-4a**  
**Typical Underground Transport Route Using W-30**

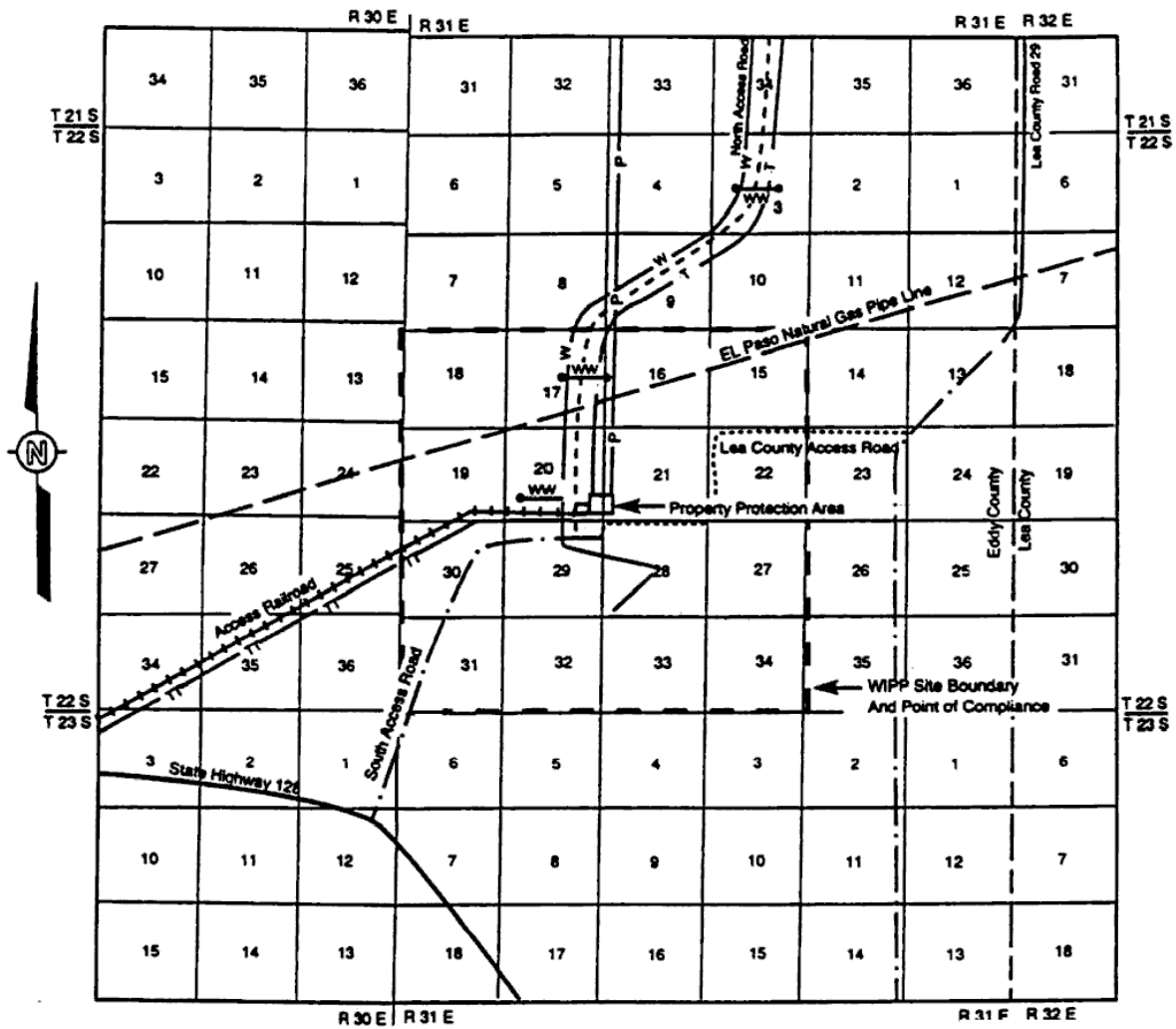
# ATTACHMENT B

## HAZARDOUS WASTE PERMIT APPLICATION PART A

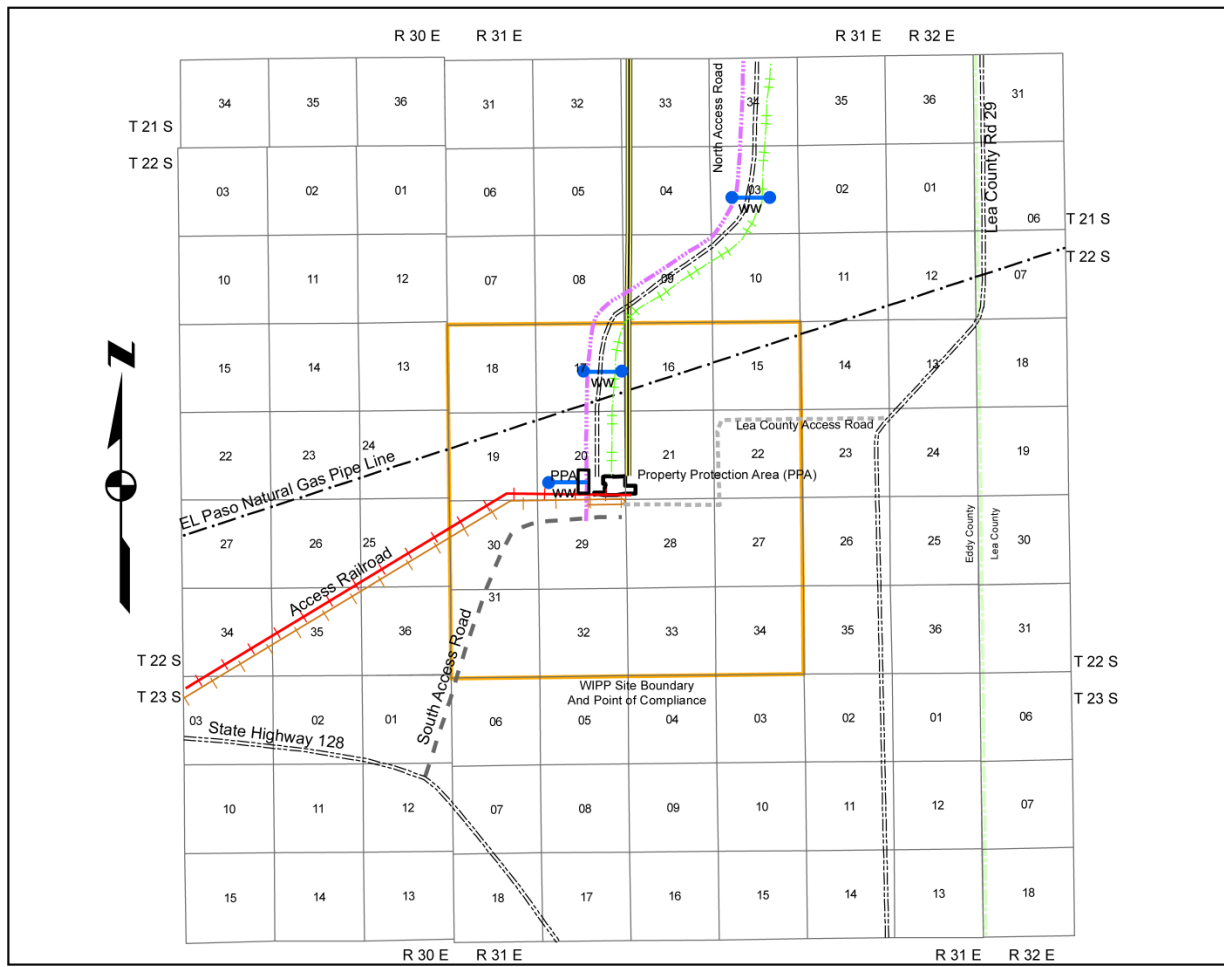
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**{APPENDIX B2  
MAPS**



This illustration for  
Information Purposes only.



**Figure B2-2**  
**Planimetric Map-WIPP Facility Boundaries**

## LEGEND

- — — WIPP Site Boundary 10,240 Acres.
- W — U.S. DOE Right of Way Number NM-53809. For Waterline, 50 Feet Wide.  
The DOE had Agreed with the City of Carlsbad to Allow the Individuals to Tap this Line Located within the North Access Road Right of Way.
- W W — Stock Water Tanks and Tap Lines Connected to the Main WIPP Waterline.
- P — Southwestern Public Service Company Right of Way Number NM-43203 for Power. 60 Feet Wide.
- T — General Telephone of the Southwest Right of Way for Telephone Line, 30 Feet Wide, Located within the North access Road Right of Way.
- T T — General Telephone of the Southwest Right of Way Number NM-60174 for Telephone Line, 30 Feet Wide, Located within the Railroad Right of Way.
- ..... U.S. DOE Right of Way Number NM-55675 for North Access Road, 170 Feet Wide.
- — — El Paso Natural Gas company Right of Way for Gas Pipeline, 30 Feet Wide in Section 16, 50 Feet Wide Elsewhere.
- + + + — U.S. DOE Right of Way Number NM-55699 for Access Railroad, 150 Feet Wide.
- . . . — U.S. DOE Right of Way for Access Roads Includes Right of Way Number NM-123703 for the South Access Road which is 140 Feet Wide.

## NOTES

1. The Property Protection Area is a fenced area of approximately 35 acres. It contains all surface facilities with the exception of salt storage piles, parking lot, landfill and waste water stabilization lagoons.
2. Zone II overlies the maximum extent of the Area available for underground development.
3. WIPP site boundary (WSB) provides a one mile buffer area around the area available for underground development.

## **Legend**

-  WIPP Site Boundary 10,240 Acres.
-  U.S. DOE Right of Way Number NM-53809. For Waterline, 50 Feet Wide.  
The DOE had Agreed with the City of Carlsbad to Allow the Individuals to Tap this Line Located within the North Access Road Right of Way.
-  Tap Lines Connected to the Main WIPP Waterline (ww).
-  Stock Water Tanks.
-  Southwestern Public Service Company Right of Way Number NM-43203 for Power 60 Feet Wide.
-  General Telephone of the Southwest Right of Way for Telephone Line, 30 Feet Wide, Located within the North Access Road Right of Way.
-  General Telephone of the Southwest Right of Way Number NM-60174 for Telephone Line, 30 Feet Wide, Located within the Railroad Right of Way.
-  U.S. DOE Right of Way Number NM-55675 for North Access Road, 170 Feet Wide.
-  U.S. DOE Right of Way for Access Roads Includes Right of Way Number NM-123703 for the South Access Road, 140 Feet Wide.
-  El Paso Natural Gas Company Right of Way for Gas Pipeline, 30 Feet Wide in Section 16, 50 Feet Wide Elsewhere.
-  U.S. DOE Right of Way Number NM-55699 for Access Railroad, 150 Feet Wide.

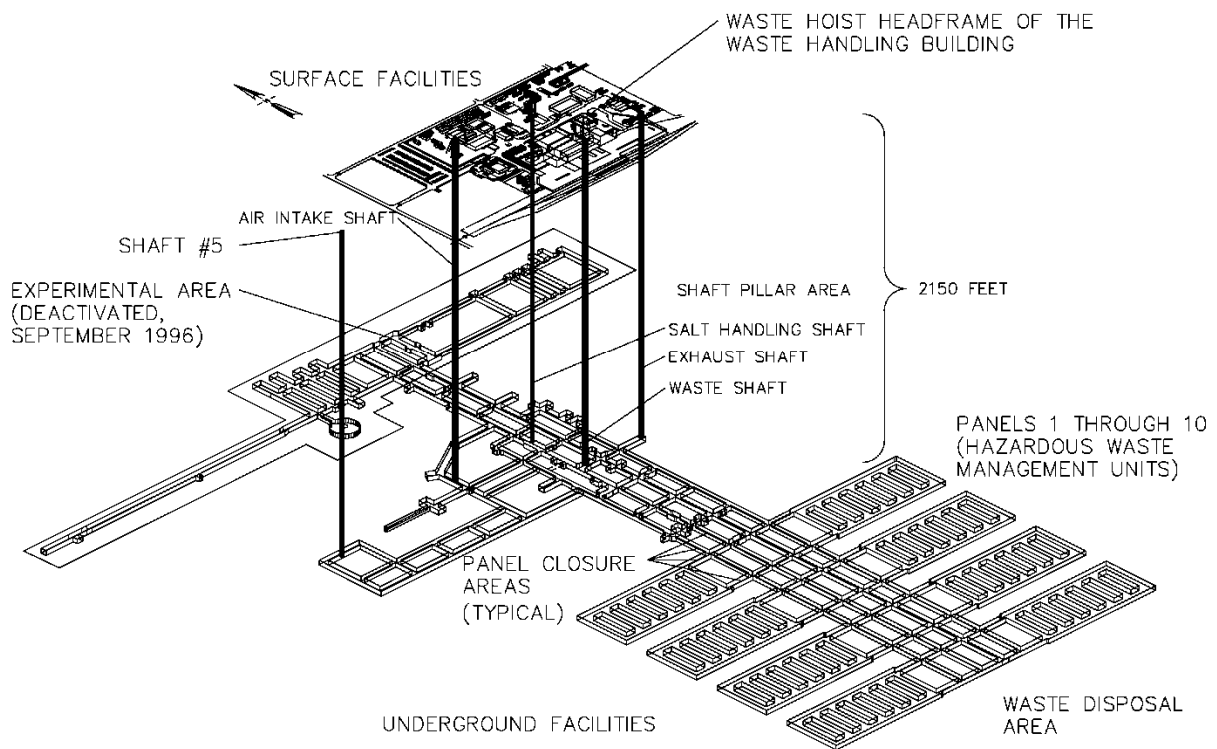
## **NOTES**

1. The Property Protection Area is a fenced area of approximately 35 acres. It contains all surface facilities with the exception of salt storage piles, parking lot, landfill and waste water stabilization lagoons.
2. An additional Property Protection Area of approximately 22 acres surrounds shaft #5.
3. WIPP Site Boundary (WSB) provides a one mile buffer area around the area available for underground development

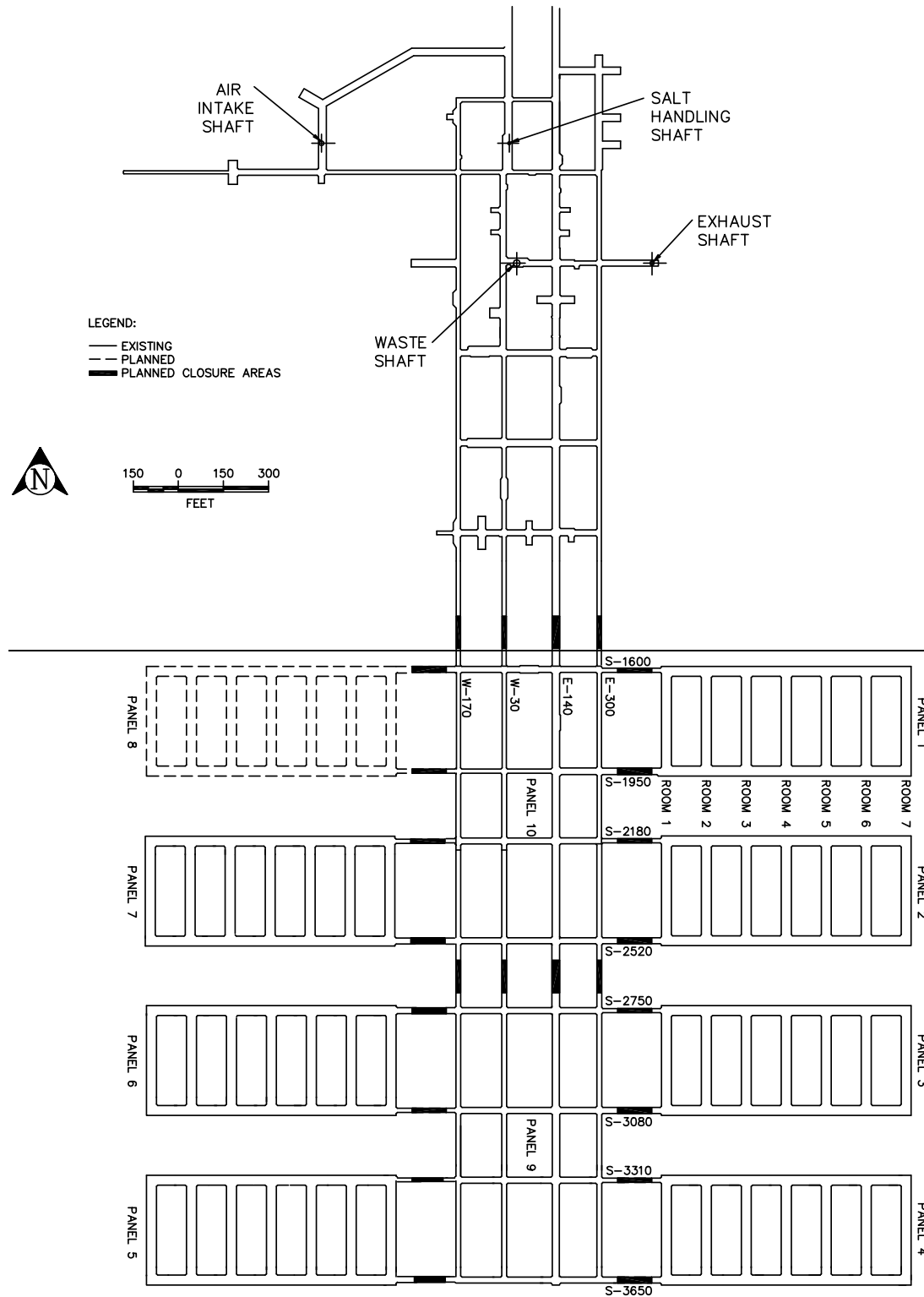
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**Figure B2-2a**  
**Legend to Figure B2-2**

## **APPENDIX B3 FACILITIES**



**Figure B3-1-S#5**  
**Spatial View of the WIPP Facility (with S#5)**



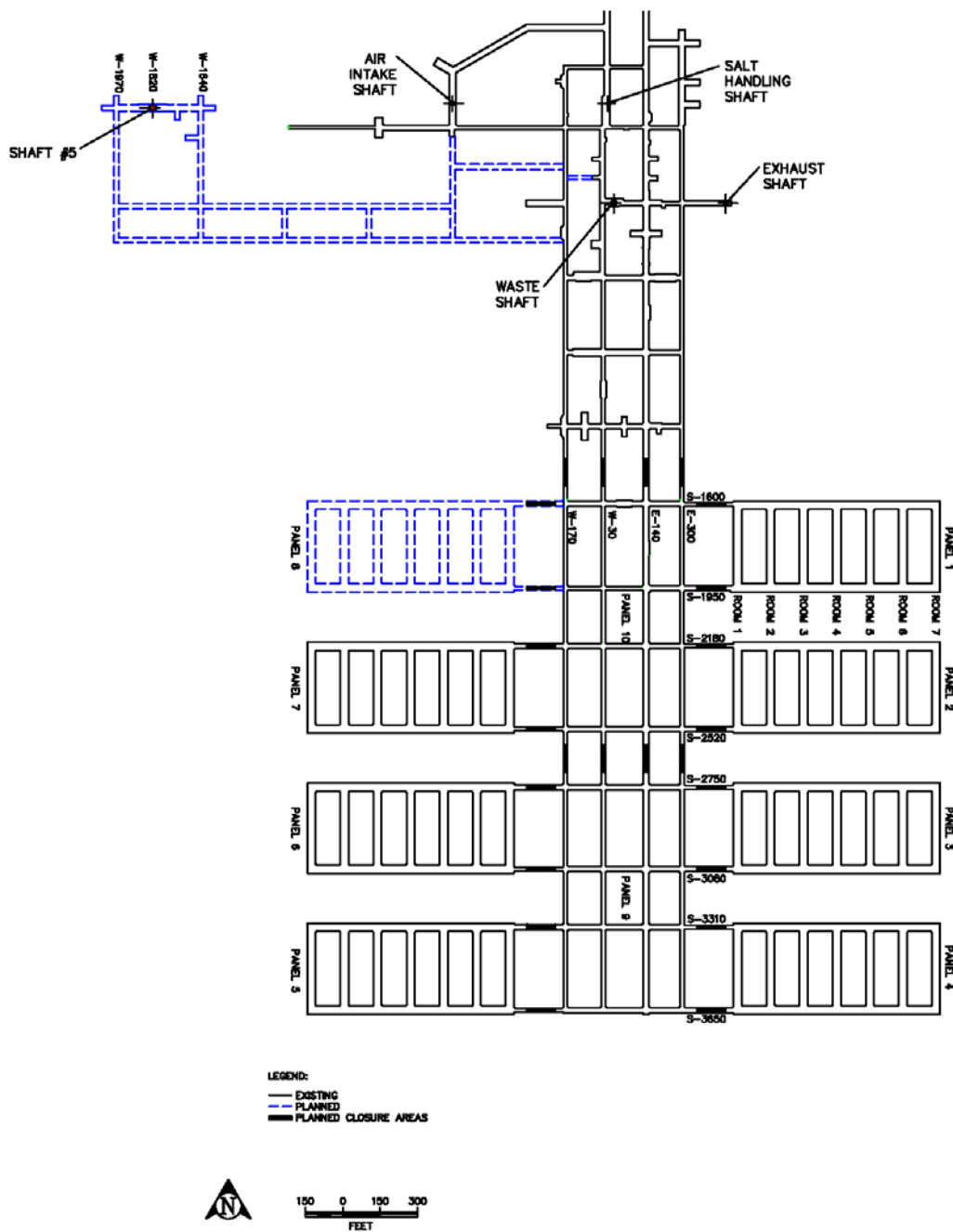


Figure B3-2  
Repository Horizon

# ATTACHMENT D

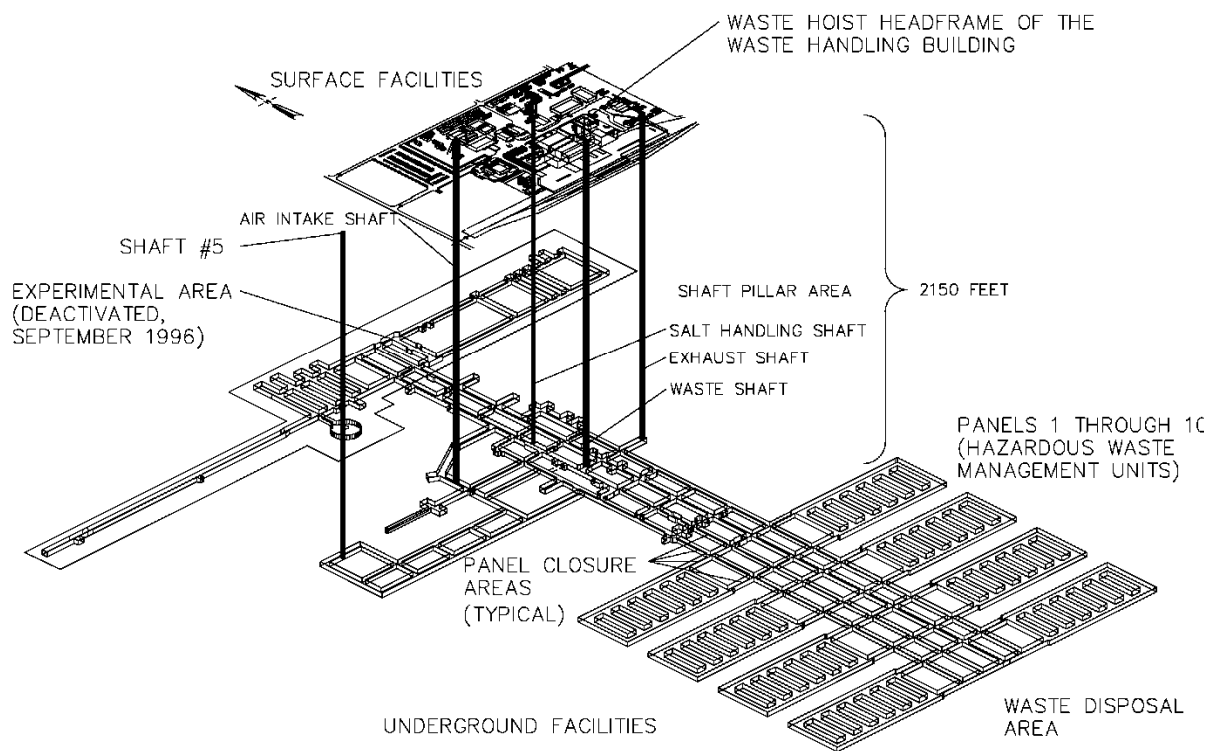
## RCRA CONTINGENCY PLAN

### LIST OF TABLES

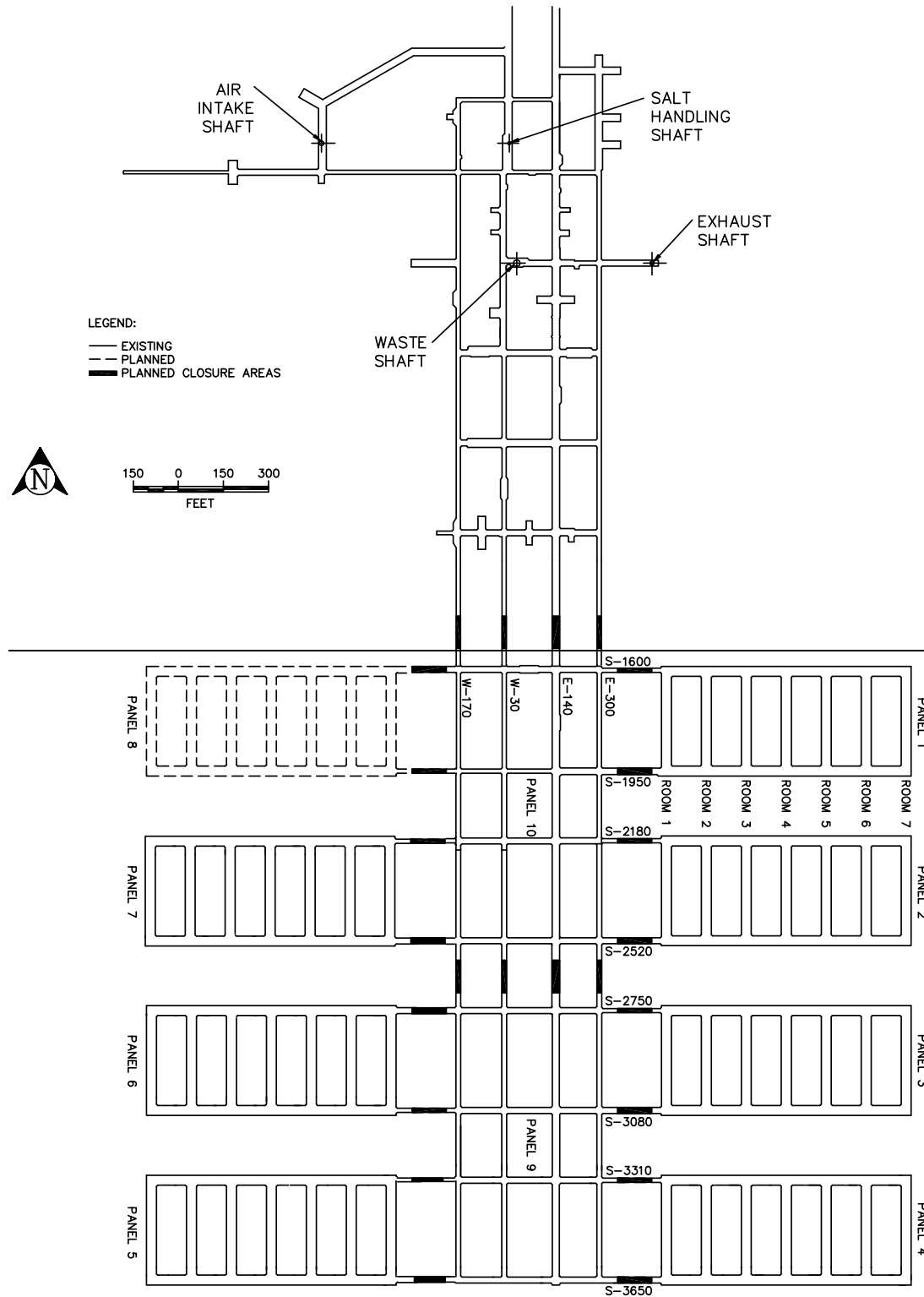
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|-----------|-------------------------------------------------------------------|
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| Figure D-8            | WIPP Site Evacuation Routes                            |



**Figure D-2-S#5**  
**Spatial View of the WIPP Facility (with S#5)**



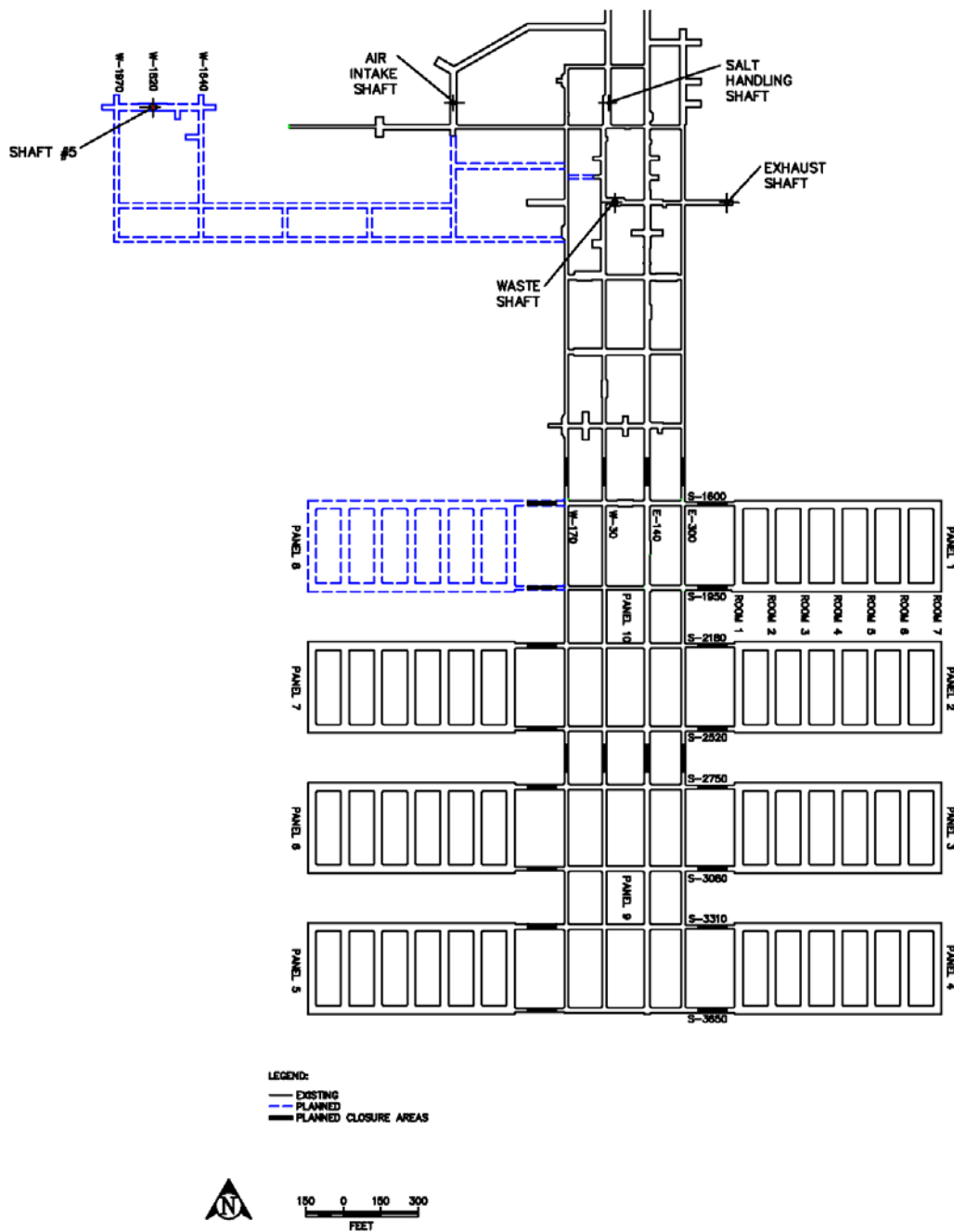
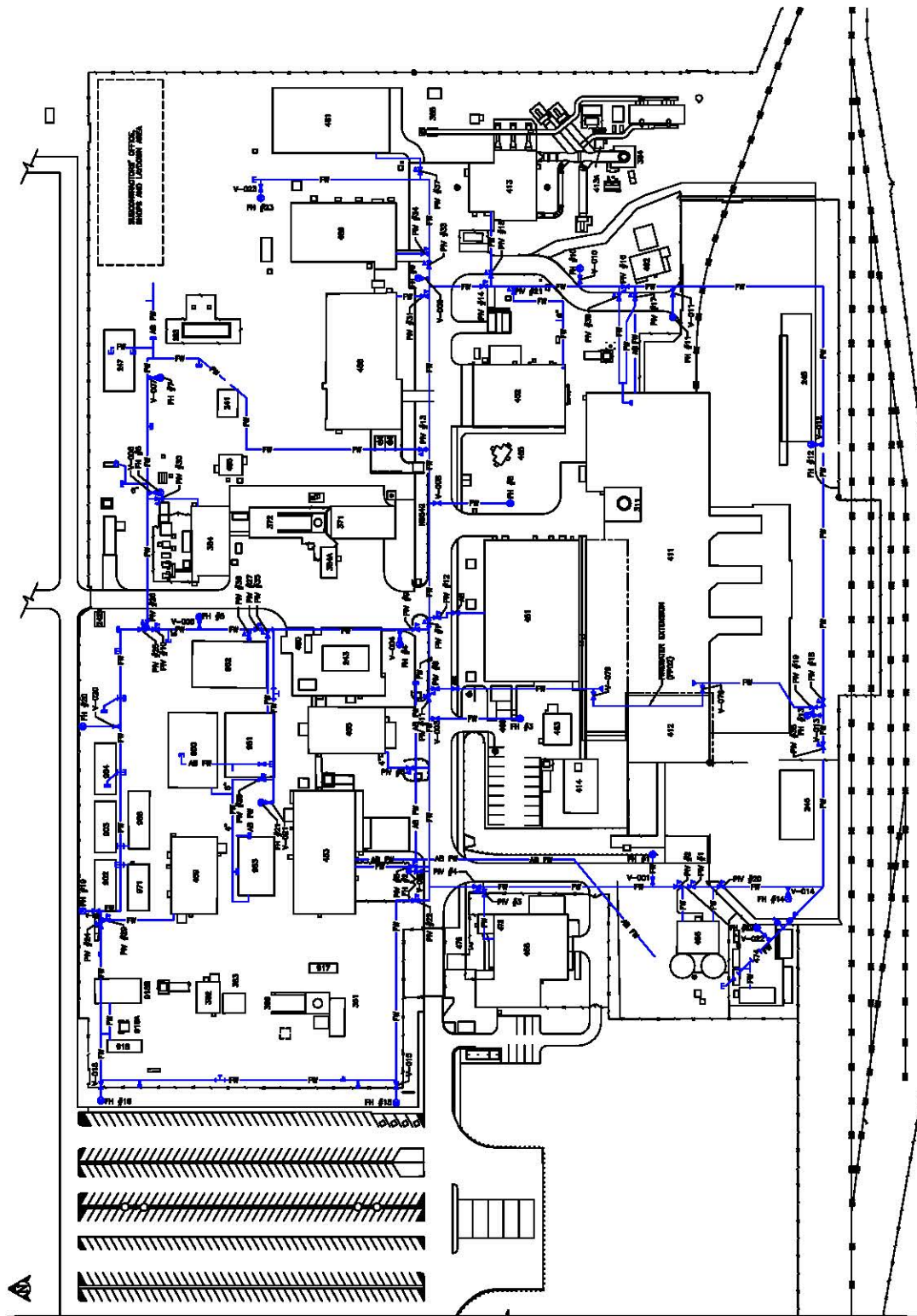


Figure D-3  
WIPP Underground Facilities



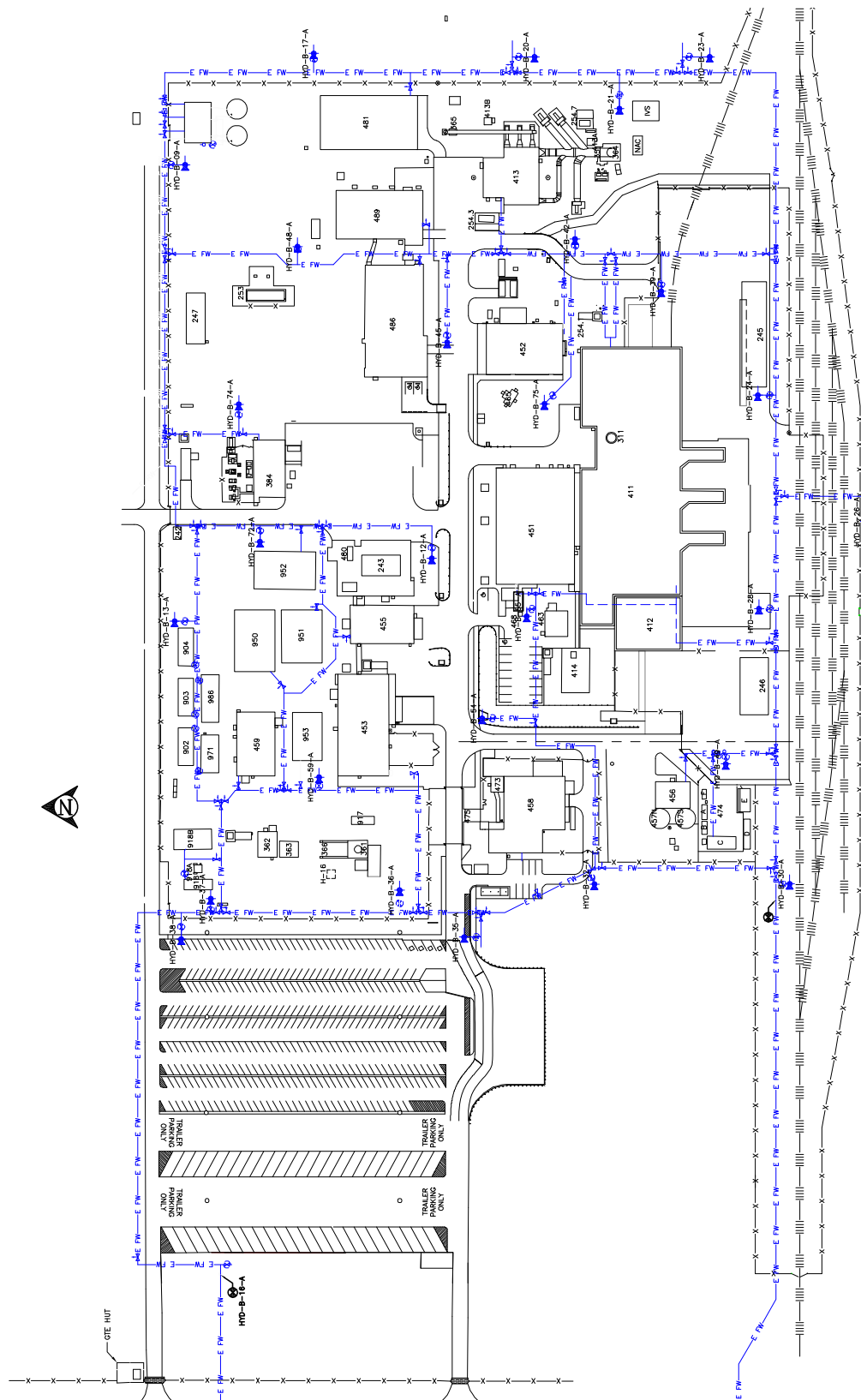
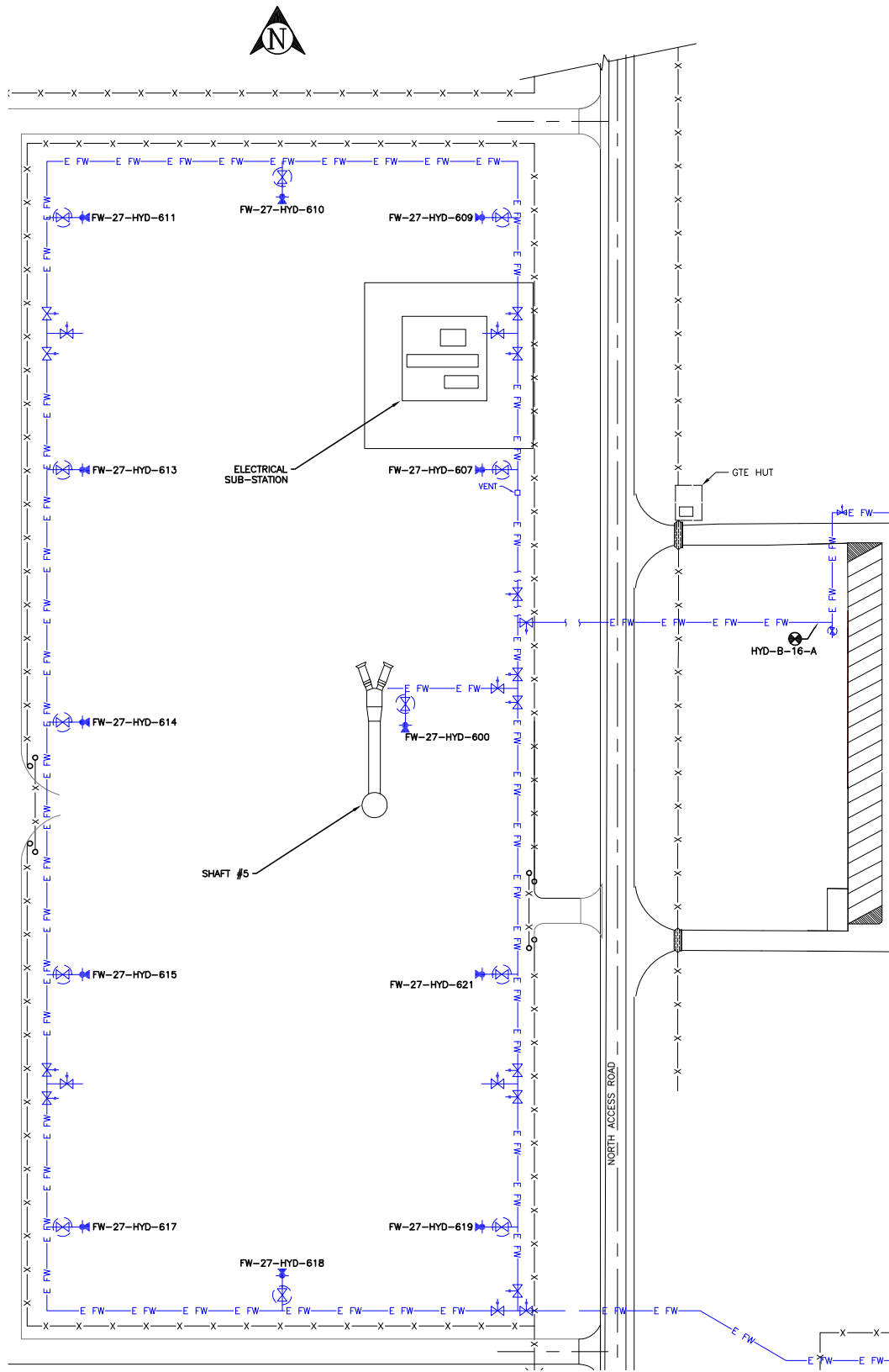
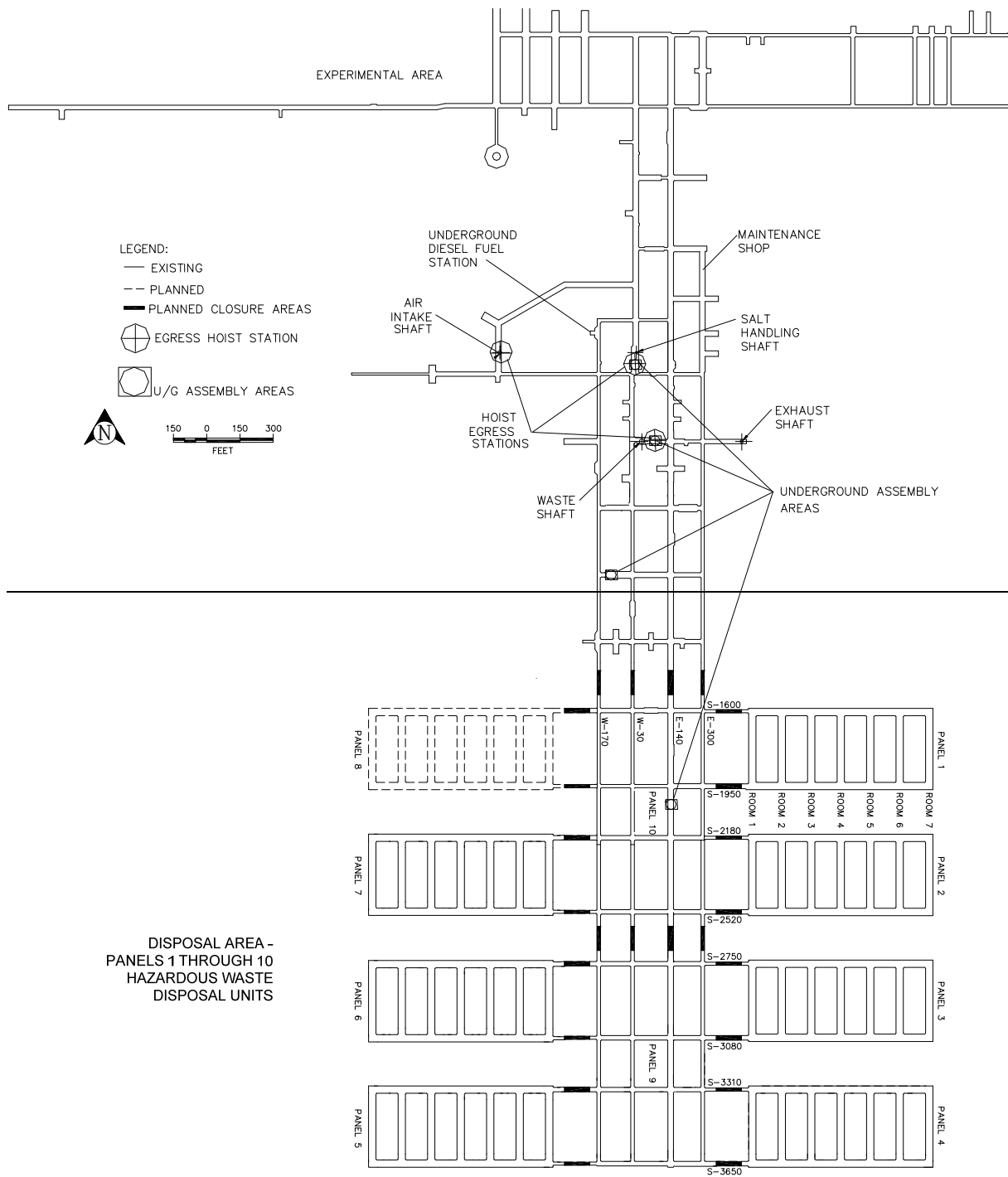
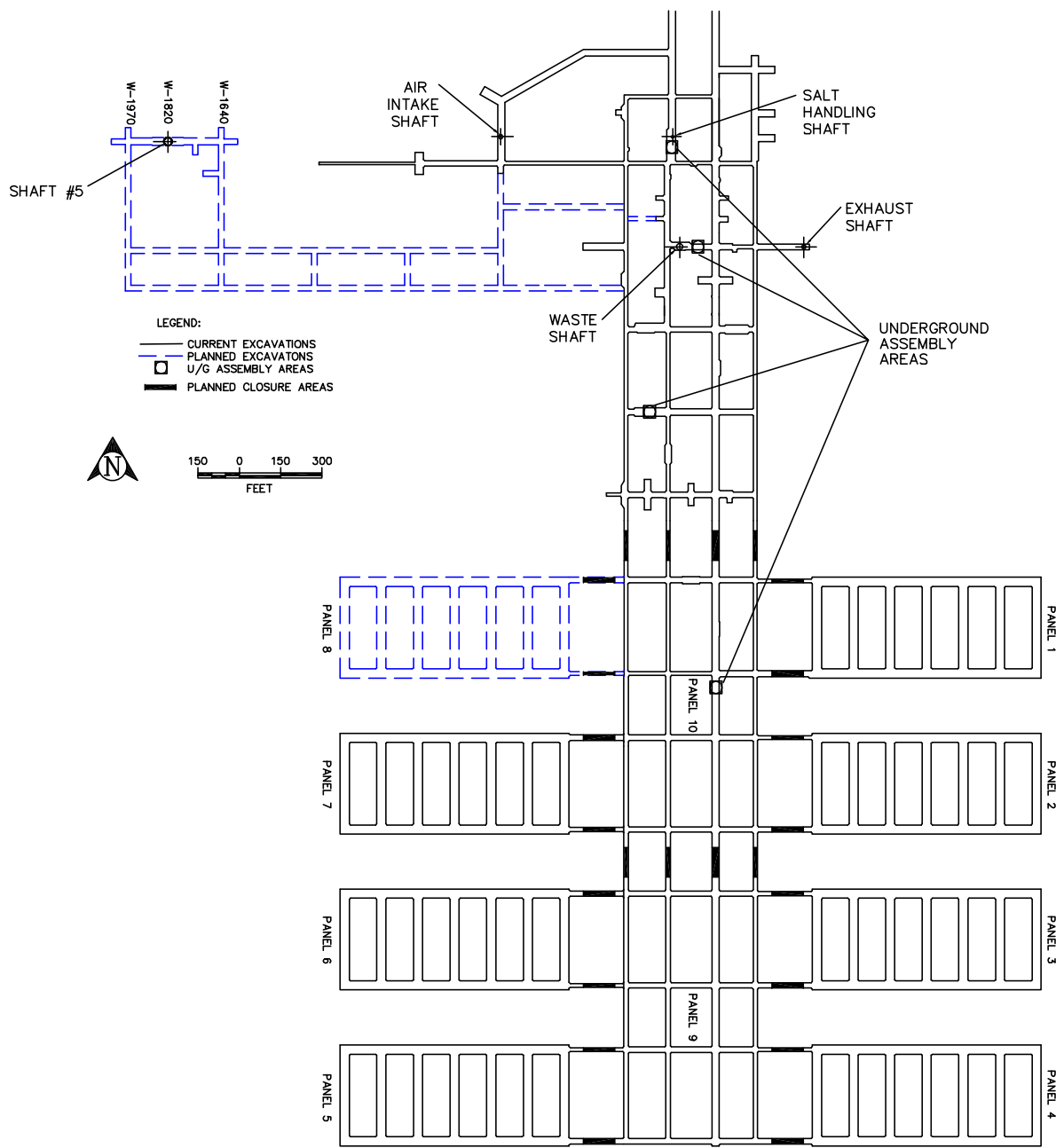


Figure D-5  
Fire-Water Distribution System

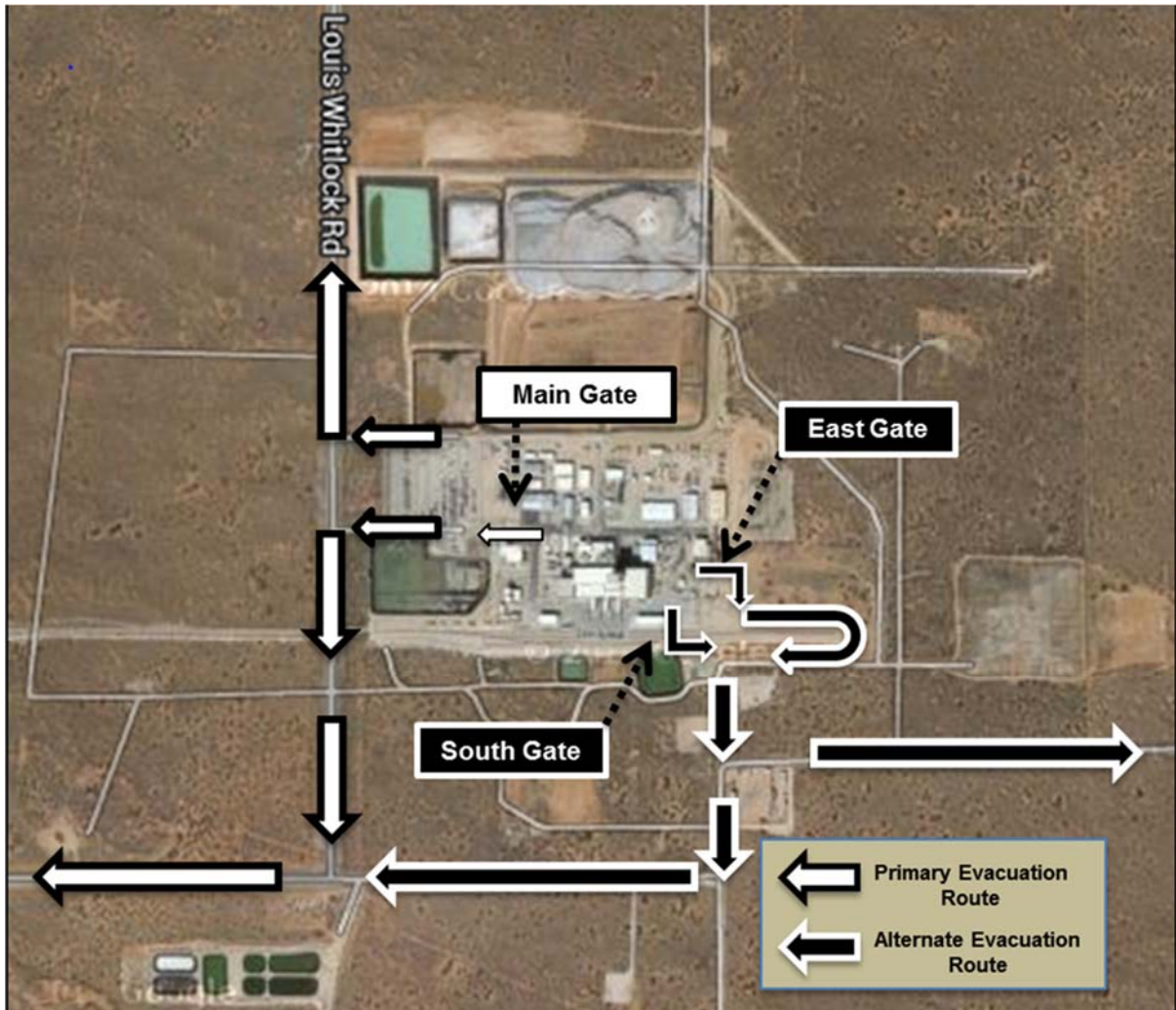


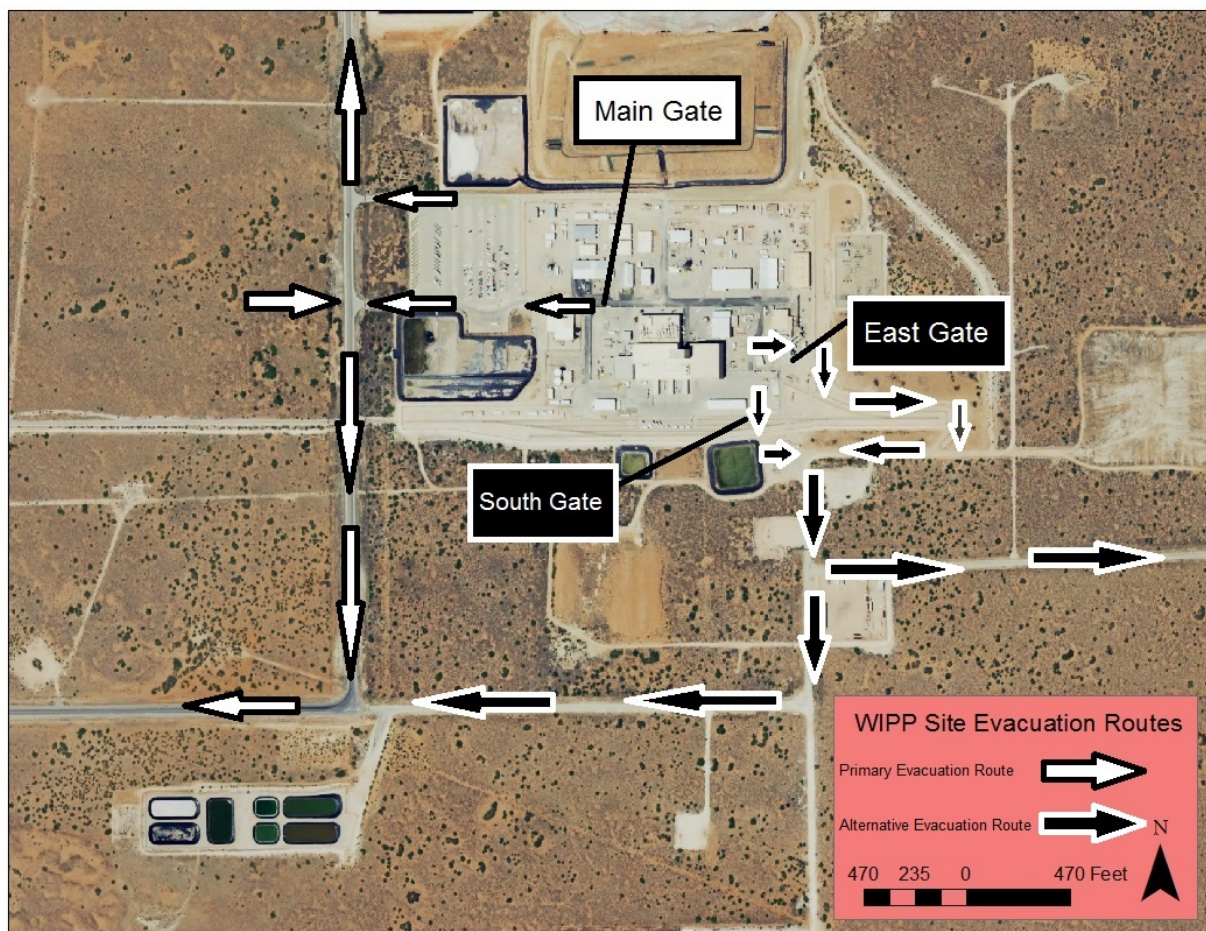
**Figure D-5-S#5**  
**Fire-Water Distribution System (with S#5)**





**Figure D-7**  
**Designated Underground Assembly Areas**





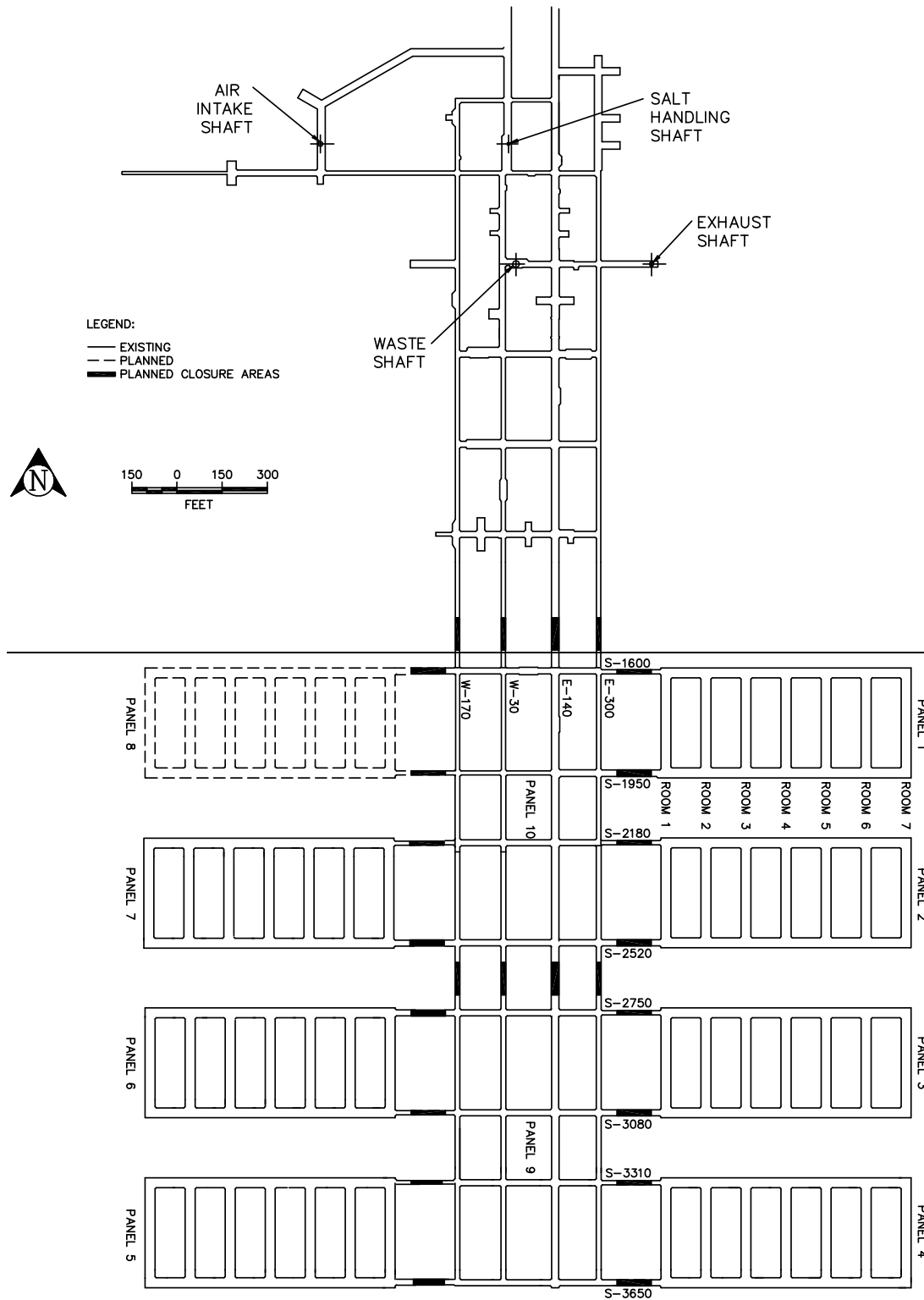
**Figure D-8**  
**WIPP Site Evacuation Routes**

## ATTACHMENT G

### CLOSURE PLAN

#### Introduction

This Permit Attachment contains the Closure Plan that describes the activities necessary to close the Waste Isolation Pilot Plant (**WIPP**) individual units and facility. Since the current plans for operations extend over several decades, the Permittees will periodically reapply for an operating permit in accordance with 20.4.1.900 NMAC (incorporating 40 CFR §270.10(h)). Consequently, this Closure Plan describes several types of closures. The first type is panel closure, which involves constructing closures in each of the underground hazardous waste disposal units (**HWDUs**) after they are filled. The second type is partial closure, which can be less than the entire facility and therefore less than an entire unit as described herein for the Waste Handling Building (**WHB**) Unit and the Parking Area Unit (**PAU**). The third type of closure is final facility closure at the end of the Disposal Phase, which will entail “clean” closure of all remaining surface storage units and construction of the four shaft seal systems for each shaft. Finally, in the event a new permit is not issued prior to expiration of an existing permit, a modification to this Closure Plan will be sought to perform contingency closure. Contingency closure defers the final closure of waste management facilities such as the Waste Handling Building Container Storage Unit (**WHB Unit**), the conveyances, the shafts, and the haulage ways because these will be needed to continue operations with non-mixed Transuranic (**TRU**) waste.



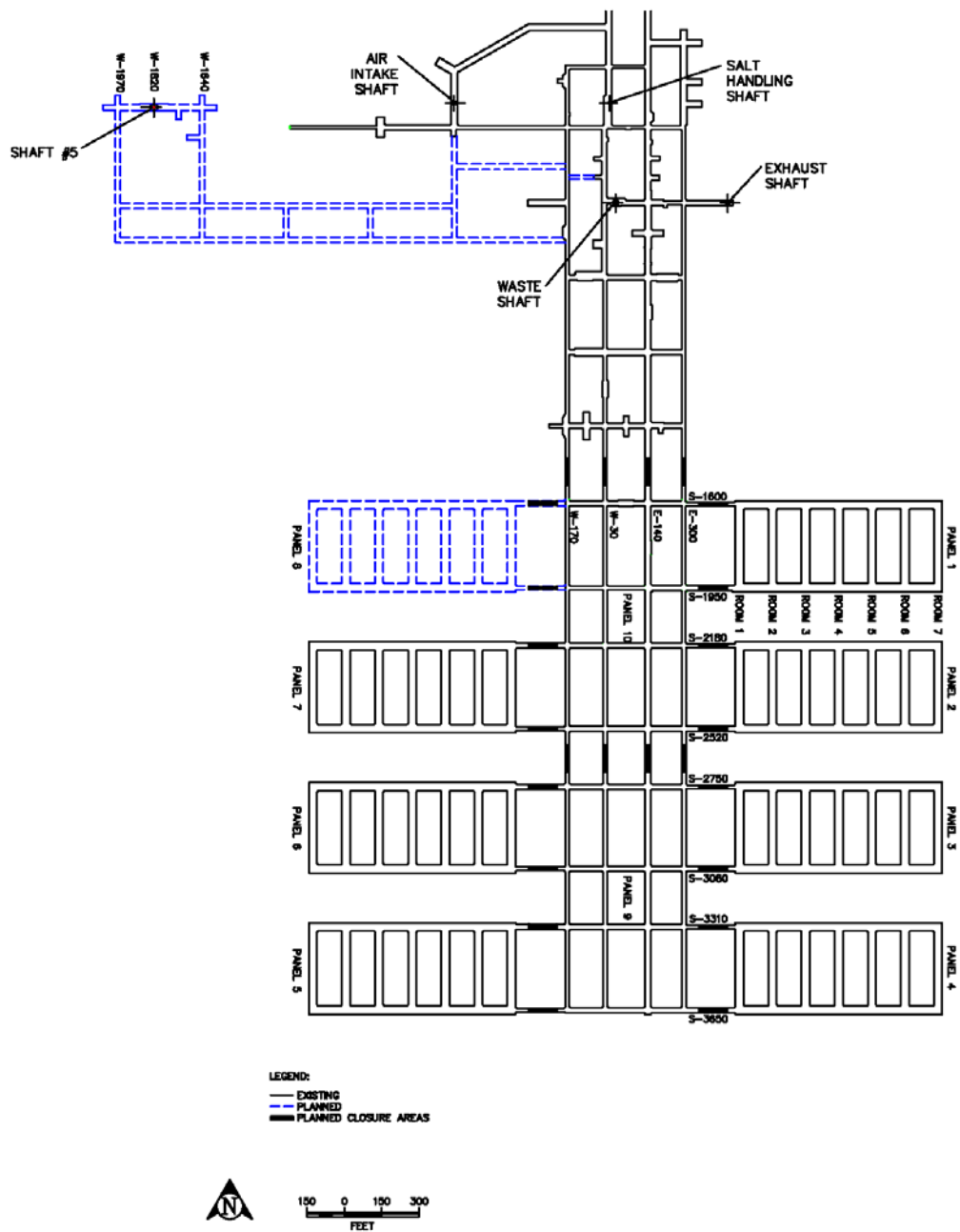
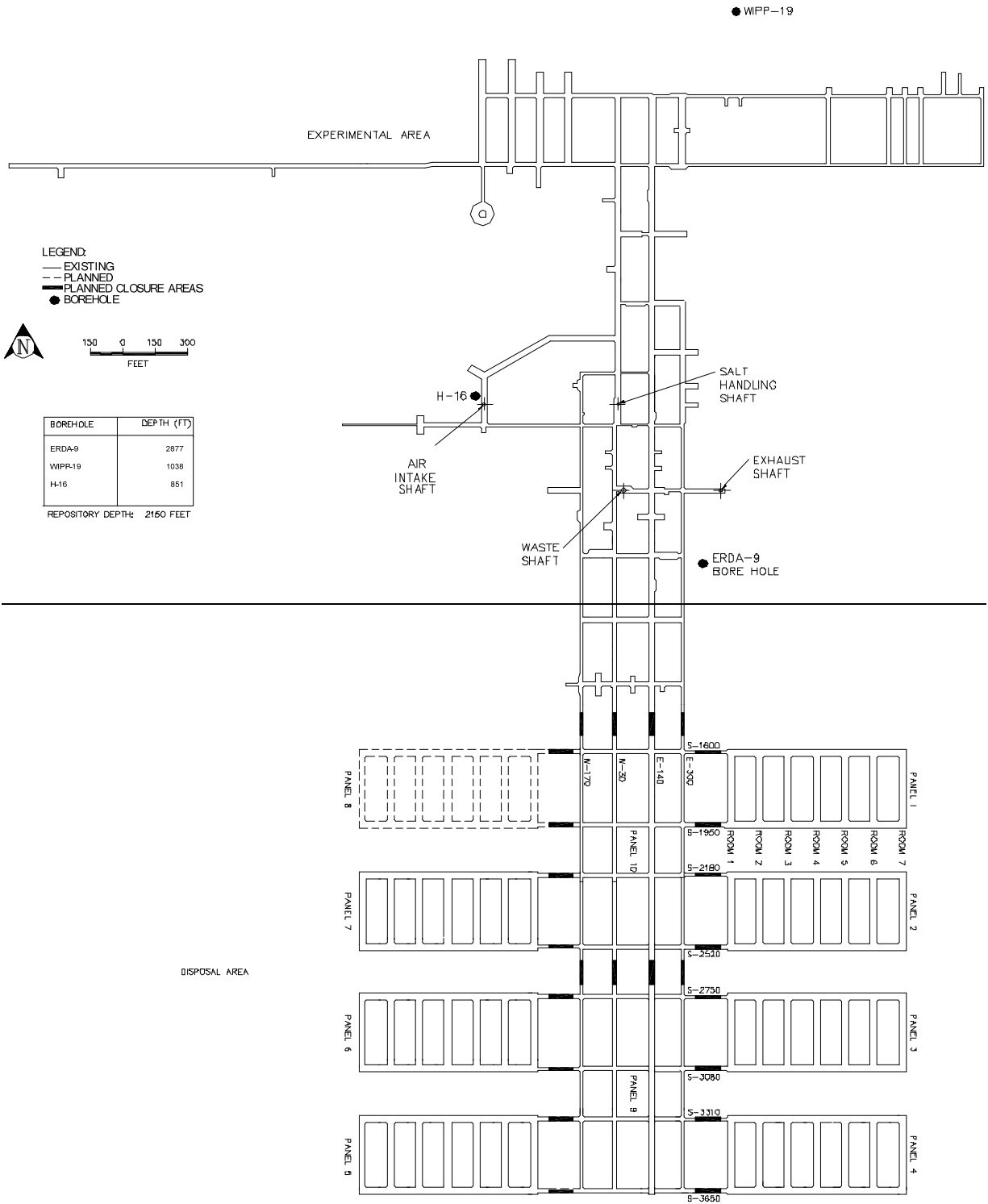


Figure G-1  
Location of Underground HWDUs and Anticipated Closure Locations



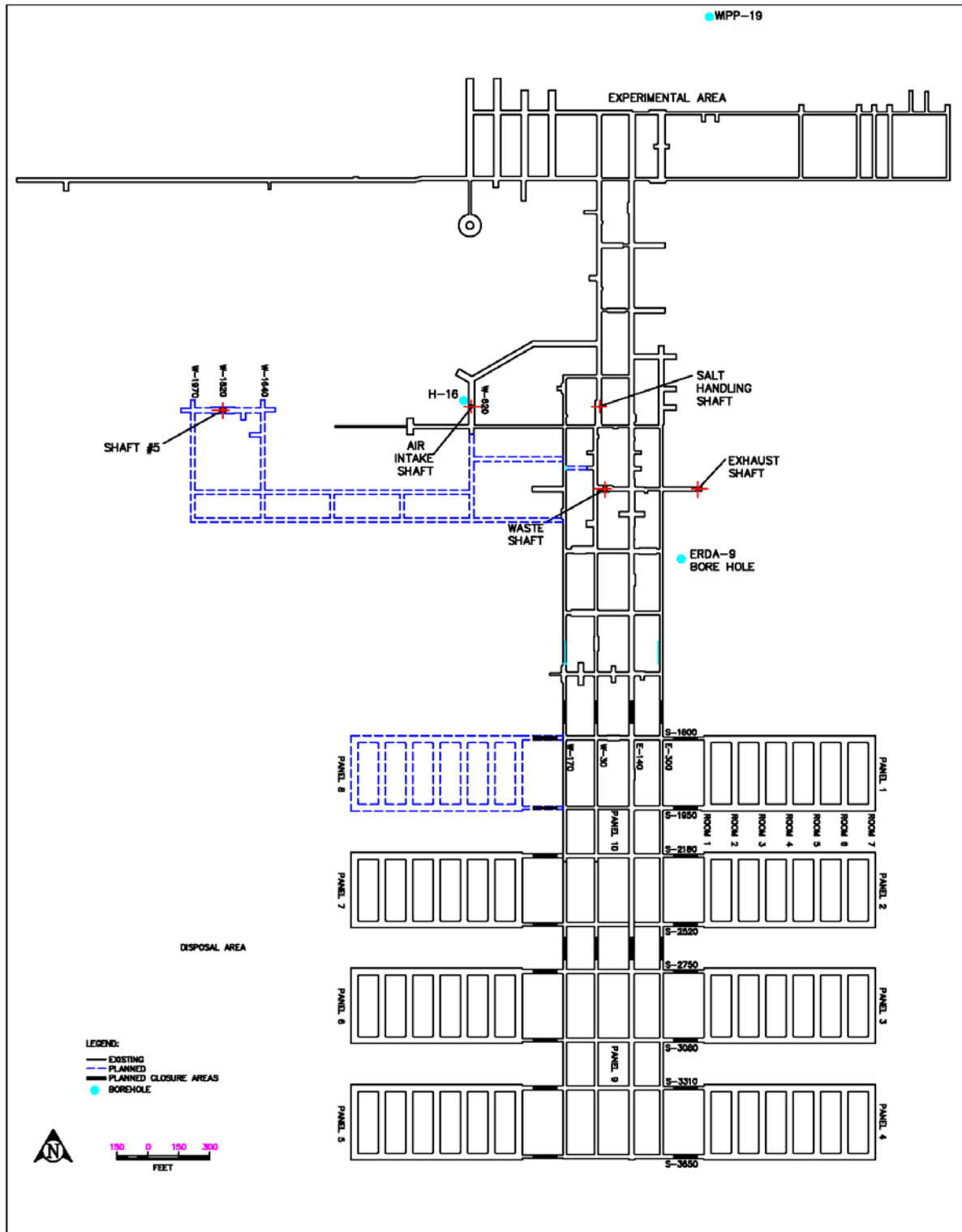


Figure G-6  
Approximate Locations of Boreholes in Relation to the WIPP Underground

**Appendix C**  
**WIPP New Shaft and Connecting Drifts Illustrations**

