



HDI PNP 2024-037

10 CFR 50.12
10 CFR 50.54(q)
10 CFR 50.80
10 CFR 50.82(a)(2)
10 CFR 50.90
10 CFR 72.50

October 4, 2024

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

Palisades Nuclear Plant
NRC Docket No. 50-255
Renewed Facility Operating License No. DPR-20

Subject: Response to Requests for Additional Information Regarding the Proposed
Reauthorization of Power Operations of Palisades Nuclear Plant under Renewed
Facility Operating License Number DPR-20

In Reference 1, Holtec Decommissioning International, LLC (HDI) on behalf of Holtec Palisades LLC, submitted to the NRC, for Palisades Nuclear Plant (PNP), a request for a one-time exemption from Title 10 of the Code of Federal Regulations (10 CFR) 50.82, *Termination of license*, paragraph (a), subparagraph (2), 10 CFR 50.82(a)(2), which prohibits reactor power operations and retention of fuel in the reactor vessel once the 10 CFR 50.82(a)(1) certifications are docketed. In addition to the Exemption in Reference 1, five additional licensing action requests, listed in Reference 2 through 6, were submitted to the NRC to support the reauthorization of power operations at PNP. Collectively these six submittals define the proposed NRC Federal Action to reauthorize power operations at PNP and comprise the scope of the NRC environmental review.

In Reference 7, the NRC requested additional information to support the environmental review.

The enclosures to this letter provide the HDI response to the NRC requests for additional information (RAI).

In accordance with 10 CFR 50.91 *Notice for public comment; State consultation*, paragraph (b), HDI is notifying the State of Michigan of these RAI responses by transmitting a copy of this letter, with its enclosures, to the designated State of Michigan official.

If you have any questions regarding this submittal, please contact Jim Miksa, Regulatory Assurance Manager, at (269) 764-2945.

I declare under penalty of perjury that the foregoing is true and correct. Executed on October 4, 2024.

Respectfully,

**Jean A.
Fleming**

Digitally signed by Jean A. Fleming
DN: cn=Jean A. Fleming, c=US,
o=Holtec Decommissioning
International, LLC, ou=Regulatory and
Environmental Affairs,
email=J.Fleming@Holtec.com
Date: 2024.10.04 08:31:05 -04'00'

Jean A. Fleming
Vice President of Licensing and Regulatory Affairs
Holtec International

- References:
- 1) Holtec Decommissioning International, LLC letter to U.S. Nuclear Regulatory Commission, "Request for Exemption from Certain Termination of License Requirements of 10 CFR 50.82," dated September 28, 2023 (ADAMS Accession No. ML23271A140)
 - 2) Holtec Decommissioning International, LLC letter to U.S. Nuclear Regulatory Commission, "Application for Order Consenting to Transfer of Control of License and Conforming License Amendments," dated December 6, 2023 (ADAMS Accession No. ML23340A161)
 - 3) Holtec Decommissioning International, LLC letter to U.S. Nuclear Regulatory Commission, "Request to Revise Operating License and Technical Specifications to Support Resumption of Power Operations," dated December 14, 2023 (ADAMS Accession No. ML23348A148)
 - 4) Holtec Decommissioning International, LLC letter to U.S. Nuclear Regulatory Commission, "Request to Revise the Administrative Technical Specifications to Support Resumption of Power Operations," dated February 9, 2024 (ADAMS Accession No. ML24040A089)
 - 5) Holtec Decommissioning International, LLC letter to U.S. Nuclear Regulatory Commission, "Request to Reinstate the Palisades Emergency Plan to Support Resumption of Power Operations," dated May 1, 2024 (ADAMS Accession No. ML24122C666)
 - 6) Holtec Decommissioning International, LLC letter to U.S. Nuclear Regulatory Commission, "Request to Update the Main Steam Line Break Analysis Methodology," dated May 24, 2024 (ADAMS Accession No. ML21145A143)
 - 7) U.S. Nuclear Regulatory Commission letter to Holtec International, LLC "Requests for Additional Information Regarding the Proposed Reauthorization of Power Operations of Palisades Nuclear Plant under Renewed Facility Operating License Number DPR-20 (Docket Number: 50-0255). September 20, 2024

- Enclosures: 1) Response to Requests for Additional Information – RAI-GEN-1 Regarding the Proposed Reauthorization of Power Operations of Palisades Nuclear Plant under Renewed Facility Operating License No. DPR-20

Enclosure Attachments:

- 1) Restart Activities
- 2) Historical Photos
- 3) Cooling Tower Power Cable Replacement
- 4) Existing Cooling Tower Cable Location

- 2) Response to Requests for Additional Information – RAI-GEN-2 Regarding the Proposed Reauthorization of Power Operations of Palisades Nuclear Plant under Renewed Facility Operating License No. DPR-20

Enclosure Attachments:

- 1) Michigan State Representatives Letter to Governor Whitmer
- 2) U.S. Congressmen Letter to DOE and NRC

- 3) Response to Requests for Additional Information – RAI-GEN-3 Regarding the Proposed Reauthorization of Power Operations of Palisades Nuclear Plant under Renewed Facility Operating License No. DPR-20

Enclosure Attachments:

- 1) Table 1.3-1 Environmental Authorizations for Current PNP Operations
- 2) Letter, Matt Smar, EGLE to J. Britting, HDI, RE: Coastal Zone Management Act Consistency Certification for the Palisades Nuclear Power Plant's Renewed Facility Operating License, Covert Township, Van Buren County, Michigan, August 30, 2024

- 4) Response to Requests for Additional Information – RAI-GEN-4 Regarding the Proposed Reauthorization of Power Operations of Palisades Nuclear Plant under Renewed Facility Operating License No. DPR-20

- 5) Response to Requests for Additional Information – RAI-ALT-1 Regarding the Proposed Reauthorization of Power Operations of Palisades Nuclear Plant under Renewed Facility Operating License No. DPR-20

- 6) Response to Requests for Additional Information – RAI-SW-4 Regarding the Proposed Reauthorization of Power Operations of Palisades Nuclear Plant under Renewed Facility Operating License No. DPR-20

Enclosure Attachment:

- 1) Storm Water System Map

7) Response to Requests for Additional Information – RAI-SW-11 Regarding the Proposed Reauthorization of Power Operations of Palisades Nuclear Plant under Renewed Facility Operating License No. DPR-20

8) Response to Requests for Additional Information – RAI-GW-2 Regarding the Proposed Reauthorization of Power Operations of Palisades Nuclear Plant under Renewed Facility Operating License No. DPR-20

Enclosure Attachment:

1) Geologic Cross Sections

9) Response to Requests for Additional Information – RAI-GW-3 Regarding the Proposed Reauthorization of Power Operations of Palisades Nuclear Plant under Renewed Facility Operating License No. DPR-20

Enclosure Attachment:

1) Groundwater Contours – April 25, 2023

10) Response to Requests for Additional Information – RAI-GW-5 Regarding the Proposed Reauthorization of Power Operations of Palisades Nuclear Plant under Renewed Facility Operating License No. DPR-20

11) Response to Requests for Additional Information – RAI-MET-1 Regarding the Proposed Reauthorization of Power Operations of Palisades Nuclear Plant under Renewed Facility Operating License No. DPR-20

Enclosure Attachment:

1) Palisades Meteorological Monitoring Semiannual Data Report July 1, 2023 - December 31, 2023, and 2023 Annual Summary

12) Response to Requests for Additional Information – RAI-MET-5 Regarding the Proposed Reauthorization of Power Operations of Palisades Nuclear Plant under Renewed Facility Operating License No. DPR-20

13) Response to Requests for Additional Information – RAI-MET-6 Regarding the Proposed Reauthorization of Power Operations of Palisades Nuclear Plant under Renewed Facility Operating License No. DPR-20

Enclosure Attachment:

1) 2023 Emissions Inventory Report

14) Response to Requests for Additional Information – RAI-AE-4 Regarding the Proposed Reauthorization of Power Operations of Palisades Nuclear Plant under Renewed Facility Operating License No. DPR-20

Enclosure Attachment:

1) State of Michigan Department of Environment, Great Lakes and Energy, Draft NPDES Permit No. MI0001457

15) Response to Requests for Additional Information – RAI-TE-1 Regarding the Proposed Reauthorization of Power Operations of Palisades Nuclear Plant under Renewed Facility Operating License No. DPR-20

16) Response to Requests for Additional Information – RAI-SE-1 Regarding the Proposed Reauthorization of Power Operations of Palisades Nuclear Plant under Renewed Facility Operating License No. DPR-20

Enclosure Attachment:

1) Staffing Level Estimate for Restart

17) Response to Requests for Additional Information – RAI-SE-2 Regarding the Proposed Reauthorization of Power Operations of Palisades Nuclear Plant under Renewed Facility Operating License No. DPR-20

Enclosure Attachment:

1) Palisades Holtec Demographic Information 07/09/2024

18) Response to Requests for Additional Information – RAI-EJ-1 Regarding the Proposed Reauthorization of Power Operations of Palisades Nuclear Plant under Renewed Facility Operating License No. DPR-20

Enclosure Attachment:

1) DRAFT – Community Benefits Plan

19) Response to Requests for Additional Information – RAI-HCR-5 Regarding the Proposed Reauthorization of Power Operations of Palisades Nuclear Plant under Renewed Facility Operating License No. DPR-20

20) Response to Requests for Additional Information – RAI-HCR-6 Regarding the Proposed Reauthorization of Power Operations of Palisades Nuclear Plant under Renewed Facility Operating License No. DPR-20

21) Response to Requests for Additional Information – RAI-HCR-8 Regarding the Proposed Reauthorization of Power Operations of Palisades Nuclear Plant under Renewed Facility Operating License No. DPR-20

22) Response to Requests for Additional Information – RAI-RH-1 Regarding the Proposed Reauthorization of Power Operations of Palisades Nuclear Plant under Renewed Facility Operating License No. DPR-20

Enclosure Attachment:

1) 2022 Prospective Evaluation for Palisades Station

23) Response to Requests for Additional Information – RAI-WM-1 Regarding the Proposed Reauthorization of Power Operations of Palisades Nuclear Plant under Renewed Facility Operating License No. DPR-20

- 24) Response to Requests for Additional Information – RAI-FC-1 Regarding the Proposed Reauthorization of Power Operations of Palisades Nuclear Plant under Renewed Facility Operating License No. DPR-20
- 25) Response to Requests for Additional Information – RAI-TR-2 Regarding the Proposed Reauthorization of Power Operations of Palisades Nuclear Plant under Renewed Facility Operating License No. DPR-20

cc: NRC Region III Regional Administrator
NRC Decommissioning Inspector – PNP
NRC Project Manager – PNP
Designated Michigan State Official

Enclosure 1
HDI PNP 2024-037

Enclosure 1

HDI PNP 2024-037

Response to Request for Additional Information –

RAI-GEN-1

**Regarding the Proposed Reauthorization of Power Operations of
Palisades Nuclear Plant Under
Renewed Facility Operating License No. DPR-20**

NRC RAI Number: RAI-GEN-1

Provide a detailed list of activities—all activities related to the Federal actions—planned for the PNP to support resumption of power operations (planned restart-related activities). Including:

- For any ground disturbing activities, or any refurbishment activities, (e.g., building or demolition, etc.) provide:
 - Location and scheduled start of activity.
 - Number of acres disturbed and depth of disturbance.
 - Whether the disturbance is temporary or permanent.
- Provide any historical construction disturbance photographs and maps detailing the extent of previously disturbed areas or earth disposal areas.
- A figure or drawing indicating location of all planned restart-related activities, including, laydown areas, and extent of ground disturbance on an updated site map.
- Publication-quality files of figures are needed for reproduction in the EA (sized for 8.5 x 11 in. page, resolution at least 300 dpi, in .png or .tif format). The geographic information system or GIS shapefiles that are generated are also needed.

This request for additional information intersects multiple resource areas and Federal regulations as the details of any activities may influence environmental evaluations of a variety of processes and functions. Enclosure 2, "*Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant*", of Holtec Decommissioning International's, LLC (HDI's) exemption request did not provide a detailed list of activities planned to support the resumption of power operations.

HDI Response to RAI:

Consistent with Enclosure 2, Section 2.1 of *Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant*, of the 10 CFR 50.82 Exemption Request (ML23271A140), "The proposed resumption of power operations does not include any refurbishment activities. Holtec does plan to upgrade or replace some equipment and facilities to support and maintain power operations. However, these upgrades do not involve ground disturbance beyond the already developed and disturbed area, nor do they involve new sources of environmental emissions." Please note that the plans to construct staff support facilities such as a new training facility, parking garage, visitor center and daycare facility mentioned in *Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant* Section 3.1 are no longer planned.

The planned maintenance and upgrade activities are primarily occurring on or inside existing facility structures. The activities are categorized as inside or outside activities. All restart activities in the Restart Activities Tables, Inside and Outside Activities, included in Attachment 1, are planned to start before Palisades returns to power operations. Planned maintenance and upgrade activities that involve land disturbance are identified in the list and shown on GEN-1 Figure 1a provided in Attachment 1. Not depicted on Figure 1a is the installation of mobile

personnel in-processing buildings which will be placed within existing developed areas and the new blast resistant enclosure (security features) which will be located in the Protected Area. Planned maintenance and upgrade activities are also overlaid on a USGS topography map in GEN-1 Figure 1b.

The approximate areas of ground disturbance from the existing facility development shown on the Figures 1a and 1b were developed from review of historical photos and aerial imagery. Historic photos are provided in Attachment 2.

Land disturbance will be within the existing previously developed areas and no additional acreage would be needed based on current plans. Any support areas, such as laydown areas, would also be within existing disturbed areas on the PNP site as shown on GEN-1 Figure 2 provided in Attachment 1. Estimated disturbed acreages for the outside restart activities are presented in the table of Restart Activities provided. All disturbances (occurring within previously disturbed areas) will remain disturbed with exception to any areas which require habitat restoration per the ongoing dune permitting process. GEN-1 Figure 2 shows the approximate boundary of restart activities at PNP which represents the bounding area allowed for projects to use for laydown and actual work. The area within the boundaries is approximately 64 acres.

The replacement of power cables for the existing cooling towers involves the installation of a new Plastibeton raceway and cable from the F&G Bus to the A/B Cooling Towers. The project layout is depicted in Figure 3 in Attachment 3. The project will start out using a vac-truck to remove the ground for the raceway installation from the concrete bus duct to both A/B Cooling Towers. The Plastibeton installation guide available publicly online at https://oldcastleinfrastructure.com/wp-content/uploads/2021/01/6-A-005_Plastibeton_Install-Guide_WEB.pdf provides the excavation dimensions for the selected model of 2016 on page 3 of the installation guide. Trench dimensions are 50 inches wide and 27 inches deep. Aggregate will be installed prior to installing the raceway. Just to the south of the bus duct, a vault (#1) will be installed to transition to two (2) Plastibeton raceways and two (2) 4" conduits. The two raceways and two 4" conduits will run to the east side of the vault (#2) just east of the South Radwaste gate. On the west side of the vault (#2) buried conduits will be installed under the roadway and proceed west into the dune, there they will turn south by the underground piping going to the cooling tower and proceed under the Metalith wall to the vault (#3). See Figure 4 in Attachment 3 for this pathway. On the south side of vault #3, we will a transition back to two Plastibeton raceways and two 4" conduits. The vault locations are depicted in Figure 5 in Attachment 3. One raceway and one 4" conduit will traverse to the first tower (A Tower) and turn east across the road. Both raceway and conduit will proceed east between transformer #71 and the A cooling tower where they will then transition to the backside of transformers #73 and #75, stopping behind #75. See Figure 6 in Attachment 3 for the A cooling tower raceway pathway. The other raceway and the remaining 4" conduit will traverse south to the second tower (B Tower) and turn east across the road. Both raceway and conduit will proceed east between transformers #72, #74 and #76 and the B cooling tower stopping at #76. See Figure 7 in Attachment 3 for the B cooling tower raceway pathway.

The existing buried cable for the F&G bus traverses underneath the access road at the south end of the protected area, underneath the previously disturbed dune, then runs alongside the north side of both cooling towers, and runs along the east side of the access road between the

two cooling towers. This buried cable will be abandoned in place. Drawings of the existing buried cable location are provided in Figures 8 and 9 in Attachment 4. Equipment and materials would be transported to the site via existing highways.

The truck deliveries are estimated at approximately 3,000 over an approximately 18-month period for restart activities. The truck deliveries would result in air emissions; however, at this level of activity the average number of trucks per day would be less than 10. PNP is located in a county that is in attainment for all criteria air pollutants.

Files responsive to the 4th bullet in RAI GEN-1 (listed below) are submitted to NRC's secure file location via Box.

Figure tif files:

GEN-1 Figure 1a.tif
GEN-1 Figure 1b.tif
GEN-1 Figure 2.tif

Figure 1a and 1b Shapefiles:

Access_Drive_Extent_of_Disturbance.cpg
Access_Drive_Extent_of_Disturbance.dbf
Access_Drive_Extent_of_Disturbance.prj
Access_Drive_Extent_of_Disturbance.sbn
Access_Drive_Extent_of_Disturbance.sbx
Access_Drive_Extent_of_Disturbance.shp
Access_Drive_Extent_of_Disturbance.shp.xml
Access_Drive_Extent_of_Disturbance.shx
Buried_Pipeline_Repair_Area.cpg
Buried_Pipeline_Repair_Area.dbf
Buried_Pipeline_Repair_Area.prj
Buried_Pipeline_Repair_Area.sbn
Buried_Pipeline_Repair_Area.sbx
Buried_Pipeline_Repair_Area.shp
Buried_Pipeline_Repair_Area.shp.xml
Buried_Pipeline_Repair_Area.shx
CableTrays_CoolingTowers.cpg
CableTrays_CoolingTowers.dbf
CableTrays_CoolingTowers.prj
CableTrays_CoolingTowers.sbn
CableTrays_CoolingTowers.sbx
CableTrays_CoolingTowers.shp
CableTrays_CoolingTowers.shp.xml
CableTrays_CoolingTowers.shx
Digital_Staging_Testing_Building.cpg
Digital_Staging_Testing_Building.dbf
Digital_Staging_Testing_Building.prj
Digital_Staging_Testing_Building.sbn
Digital_Staging_Testing_Building.sbx
Digital_Staging_Testing_Building.shp
Digital_Staging_Testing_Building.shp.xml

Digital_Staging_Testing_Building.shx
Disturbance_for_AccessRd.cpg
Disturbance_for_AccessRd.dbf
Disturbance_for_AccessRd.prj
Disturbance_for_AccessRd.sbn
Disturbance_for_AccessRd.sbx
Disturbance_for_AccessRd.shp
Disturbance_for_AccessRd.shp.xml
Disturbance_for_AccessRd.shx
Intake_Pipe_and_Crib.cpg
Intake_Pipe_and_Crib.dbf
Intake_Pipe_and_Crib.prj
Intake_Pipe_and_Crib.sbn
Intake_Pipe_and_Crib.sbx
Intake_Pipe_and_Crib.shp
Intake_Pipe_and_Crib.shp.xml
Intake_Pipe_and_Crib.shx
Palisades_Site_Boundary.cpg
Palisades_Site_Boundary.dbf
Palisades_Site_Boundary.prj
Palisades_Site_Boundary.sbn
Palisades_Site_Boundary.sbx
Palisades_Site_Boundary.shp
Palisades_Site_Boundary.shp.xml
Palisades_Site_Boundary.shx
Previously_Disturbed_Area_Approximated.cpg
Previously_Disturbed_Area_Approximated.dbf
Previously_Disturbed_Area_Approximated.prj
Previously_Disturbed_Area_Approximated.sbn
Previously_Disturbed_Area_Approximated.sbx
Previously_Disturbed_Area_Approximated.shp
Previously_Disturbed_Area_Approximated.shp.xml
Previously_Disturbed_Area_Approximated.shx
RadWaste_Project_Locations.cpg
RadWaste_Project_Locations.dbf
RadWaste_Project_Locations.prj
RadWaste_Project_Locations.sbn
RadWaste_Project_Locations.sbx
RadWaste_Project_Locations.shp
RadWaste_Project_Locations.shp.xml
RadWaste_Project_Locations.shx
Security_Fence_Installation_Project.cpg
Security_Fence_Installation_Project.dbf
Security_Fence_Installation_Project.prj
Security_Fence_Installation_Project.sbn
Security_Fence_Installation_Project.sbx
Security_Fence_Installation_Project.shp
Security_Fence_Installation_Project.shp.xml
Security_Fence_Installation_Project.shx

Figure 2 Shapefiles:

Palisades_Site_Boundary.cpg
Palisades_Site_Boundary.dbf
Palisades_Site_Boundary.prj
Palisades_Site_Boundary.sbn
Palisades_Site_Boundary.sbx
Palisades_Site_Boundary.shp
Palisades_Site_Boundary.shp.xml
Palisades_Site_Boundary.shx
Previously_Disturbed_Area_Approximated.cpg
Previously_Disturbed_Area_Approximated.dbf
Previously_Disturbed_Area_Approximated.prj
Previously_Disturbed_Area_Approximated.sbn
Previously_Disturbed_Area_Approximated.sbx
Previously_Disturbed_Area_Approximated.shp
Previously_Disturbed_Area_Approximated.shp.xml
Previously_Disturbed_Area_Approximated.shx
Restart_Laydown_Areas.cpg
Restart_Laydown_Areas.dbf
Restart_Laydown_Areas.prj
Restart_Laydown_Areas.sbn
Restart_Laydown_Areas.sbx
Restart_Laydown_Areas.shp
Restart_Laydown_Areas.shp.xml
Restart_Laydown_Areas.shx

References:

None.

Associated Attachments:

1. Restart Activities
2. Historical Photos
3. Cooling Tower Power Cable Replacement
4. Existing Cooling Tower Cable Location

Enclosure 1
Attachment 1
HDI PNP 2024-037

HDI PNP 2024-037

Enclosure 1

Attachment 1 - Restart Activities

10 pages follow

Restart Activities

Activities to take place **outside** of existing structures:

| Activity | Land disturbance (including need for laydown)? | Approx. acreage of disturbance including laydown |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| Replace eighteen (18) power cables from F&G Bus 4160 VAC load centers to cooling tower 4160/480 VAC stepdown transformers | Yes, see Figure 1a, Critical Dune permitting underway with Michigan Department of Environment, Great Lakes, and Energy (EGLE) | 3 Acres |
| Install a new water demineralization system to replace the system removed following shutdown | The new system is planned to be within the existing building. New piping is not expected but would be installed within "buried piping maintenance" area depicted in Figure 1a if needed. | 0.2 Acres |
| Reinstall main transformer disconnect and associated metering to switchyard | Any lay down/land disturbance would occur inside the existing switchyard. | 0.1 Acre |
| Underground pipe repairs, repair the leaking Condensate Storage Tank (T-2) Piping | Yes, see Figure 1a | 0.1 Acre |
| Underground pipe repairs, repair the leaking Utility Water Storage Tank (T-91) Piping | Yes, see Figure 1a | 0.1 Acre |
| All required ASME Section XI, Subsection IWL Containment Concrete and Tendon Inspections | No land disturbances, laydown areas are in previously disturbed areas and are above paved ground or crushed gravel | 0.1 Acre |
| Inspections of all underground commodities identified in the associated programs | All inspections will be performed on areas where soil has been disturbed either from previous inspections or from original construction | 0.1 Acre |
| Procure Spare Main Step-up Transformer (22KV- 345kV) and Spare Aux Step-down Transformer (345kV-4160VAC) | No land disturbances, laydown areas are in previously disturbed areas and are above paved ground or crushed gravel | 0.5 Acre |
| Upgrade the Heating, Ventilation, and Cooling (HVAC) units for the Administrative Building and Training Building (including simulator cooling) | No land disturbances, upgraded units will be in same area as existing units | 0.1 Acre |
| Complete the security infrastructure changes including new barrier/wall, new intrusion detection, new/relocated ballistic resistant enclosures, and new security search detectors | Yes, see Figure 1a, Critical Dune permit being sought from EGLE | 4 Acres |

| Activity | Land disturbance (including need for laydown)? | Approx. acreage of disturbance including laydown |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| Design and construct a new south radioactive material storage building inside the security protected area boundary (see Note A.) | Yes, see Figure 1a | 1 Acre |
| Complete facility roofing inspections and repair/replace roofs as required for each site building (Turbine Building, SFP Building, Aux Building, Boiler Rooms, Admin Building, Service Building, Service Building Annex, Support Building, Training Building) | No land disturbances, laydown areas are in previously disturbed areas and are above paved ground or crushed gravel | 0.1 Acre |
| Purchase and install mobile personnel in-processing buildings to replace buildings removed from site following shutdown | No land disturbances, mobile personnel buildings staged in areas which are paved or crushed gravel (are previously disturbed) areas | 2.5 Acre |
| Complete all Inservice Inspection, Flow Accelerated Corrosion Program, and Heat Exchanger Inspection Program scope identified in the Code/Plant Programs Scoping | Inside building activities with the exception that there may be a need to excavate areas to inspect the Containment Building as part of the in-service inspection program. However, these areas would all have been previously disturbed from original construction. | 0.1 Acre |
| Expanded Access Road at south end of Protected Area. The project includes a road lane inside the new security barrier and a road lane outside the security barrier for a total of approximately 85 feet in width. The deepest point into the previously disturbed critical dune will be approximately 45 vertical feet and is located on the east end of the roadway. | Yes, see Figure 1a; Critical Dune permitting underway with EGLE | 2 Acres |
| Routine maintenance of the stormwater outfalls which may involve removal of sediment | Yes, under existing permit No. WRP020704 issued by EGLE | 0.1 Acre |
| Stormwater outfalls pipe replacement and riprap movement which could require staging of riprap and placing the same riprap back to the stormwater outfalls | Yes, under existing permit No. WRP020704 issued by EGLE | 0.5 Acre |
| Removal of sand from the cooling tower basins and refilling with water | No land disturbances, laydown areas are in previously disturbed areas nearby cooling towers | 0.1 Acre |

| Activity | Land disturbance (including need for laydown)? | Approx. acreage of disturbance including laydown |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| Mixing basin sediment removal (see Note B) | No land disturbances, laydown areas are in previously disturbed areas such as in containers near mixing basin | 0.1 Acre |
| Routine herbicide application in cooling tower areas (see Note C) | No | As needed, 2 Acre |
| Construction of Digital Staging Testing Building (associated with the Digital Electrohydraulic Control Software and computer hardware control system replacement). The building is planned to be a single story building approximately 40 feet wide by 80 feet long and 20 feet tall located between the steam generator mausoleum and spare transformer pad. The building is expected to be erected upon a concrete pad foundation. | Yes, see Figure 1a | 0.1 Acre |
| New Blast Resistant Enclosures (BREs) constructed within the Protected Area. Five outdoor BREs between 30 to 40 feet tall (above grade) will be erected. Shallow (3-6 inch) foundations, footprint is estimated to be 30 feet by 30 feet. All BREs are planned to be within the protected area, with three of the BREs along the west side of the site. | Yes. Upgraded structures will have new foundations approximately 6 inches deep and laydown areas will be within previously disturbed areas. | 0.1 Acre |
| Circulating Water Cooling System Expansion Joint Replacement | No land disturbances, laydown areas are in previously disturbed areas and are above paved ground or crushed gravel | 0.1 Acre |
| Renovate the former Feedwater Purity Building to support maintenance shop and plant staff (e.g., new windows, siding, doors, and a sky-way between the building and support building annex is expected) | Laydown areas are near building (within the protected area) in previously developed areas | 0.5 Acre |
| Complete all Preventive and Corrective Valve Maintenance identified in the PM Database and CAP. This scope shall include both Pressurizer Spray Valves. This includes required Air-Operated and Motor Operated Valve testing scope required by the associated plant program. The scope of outdoor work is to replace buried cooling tower bypass valves and actuators located in valve houses next to the cooling towers. | All work and laydown areas for this are in previously disturbed areas. | 0.1 Acre |

- A. New structure is to be rated for storage of Category 2 waste (consolidating radwaste storage from the East Radwaste Storage Building to within the Protected Area is a security and safeguard measure intended to provide added assurance of compliance with 10 CFR Part 37)
- B. Holtec will evaluate the level of sediment in the mixing basin and if needed, sediment will be removed. The sediment removal, if to be undertaken, would be conducted after the appropriate permits are obtained. Spoils would be tested for radioactivity and other contaminants as needed prior to disposal offsite.
- C. Routine herbicide application will continue in the cooling tower areas. There are no anticipated changes to pesticide/herbicide management practices, plans, and procedures for restart. Pesticide/herbicide application (substance, amount, date, location, method of application, etc.) is reported to the NRC in Annual Non-Radiological Environmental Operating Reports. Stormwater management in the cooling tower areas remains consistent with the NPDES permit and the Stormwater Pollution Prevention Plan (SWPPP), and no changes to stormwater management in this area are anticipated due to restart activities.

Activities to take place **inside** of existing structures and not expected to involve land disturbance:

| Activity |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| All thirty-one (31) welds within the population of ASME Code Case N-770 |
| All forty-nine (49) reactor head nozzles with greater than 15 years in service, consisting of forty (40) Control Rod Drive nozzles, eight (8) Incore Instrumentation nozzles, and one (1) Reactor Head vent nozzle, will be replaced |
| Replacement of all obsolete Auxiliary Feedwater Actuation System control equipment |
| Replacement of four (4) obsolete Auxiliary Feedwater Controllers |
| Replacement of obsolete Boric Acid Heat Trace cabinet and control system |
| Replacement of both Component Cooling Water (CCW) Heat Exchangers including installation of alternate Spent Fuel Pool Cooling taps and repair/replacement of CCW Heat Exchanger isolation valves |
| Retube of the upper Main Lube Oil Heat Exchanger |
| Replace the obsolete core monitoring system and IT equipment |
| Replace the existing Control Room Chiller Compressors and controls |
| Replace the Digital Electrohydraulic Control Software and computer hardware (not control valves) |
| Replace the Obsolete Reactor Building and Spent Fuel Pool Fuel Handling Equipment including transfer console and winches |
| Eliminate the Reheater Drain Tank Level Control Single-point Vulnerability with redundant valve and/or controls |
| Replace five (5) secondary plant valve controllers to improve secondary plant control and response |
| Replace all three (3) Instrument Air Compressors |
| Replace both Jib/Pedestal Cranes in containment (L-6 & L-906) |
| Replace the software and IT Hardware for the Plant Process Computer |
| Add Wi-Fi accessible gauge readers to twelve valve controllers or dial indicators in the secondary plant |
| Rerack Region two and the new fuel storage area in the Spent Fuel Pool to eliminate the 'checkerboard' pattern requirements (after reactor refueled and minimal assemblies left in spent fuel pool, after start-up) |
| Replace the software and obsolete hardware in the Main Turbine and Main Feedwater Pump (MFP) Supervisory Instrumentation including improved MFP vibration and thrust monitoring |
| Replace all thirty-eight (38) ICI Cables from the Containment wall penetration to the Reactor Head Patch Panel, including the Patch Panel Connectors, and from patch panel to Reactor Head |

| Activity |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Complete the twenty-three (23) remaining Risk-informed Fire Protection (NFPA-805) Modifications |
| Replace the elastomer flood barrier between the East Engineering Safeguards room and the West Engineering Safeguards room |
| Remove, rewind, and reinstall the Main Generator Exciter |
| Replace both Main Feedwater Pump Turbine Rotors and complete associated casing and control valve reliability maintenance |
| Maintenance for one Primary Coolant Pump Motor (EMA-2204), Replace one Primary Coolant Pump Motor (EMA-2203) with existing spare, maintenance for removed Primary Coolant Pump Motor and rotate to spare, Replace One Primary Coolant Pump (P- 50B), and replace all four Primary Coolant Pump Seals and the spare seal cartridge |
| Perform NEIL Dismantled Inspections of Generator, high pressure and both low pressure turbines, and turbine control valves. Pull Generator Rotor for bore inspection |
| Complete Reactor disassembly, reload including control elements, and reassembly for purposes of refuel |
| Complete Steam Generator Scope: 100% U-Tube Eddy Current Inspection, Secondary Side Foreign Object Search and Retrieval, and Tube Repair (Plugs and Stabilizers as identified by Eddy Current) |
| Complete all Inservice Inspection, Flow Accelerated Corrosion Program, and Heat Exchanger Inspection Program scope identified in the Code/Plant Programs |
| Primary Coolant System, Chemical and Volume Control System, and Shutdown Cooling System Chemical Decontamination |
| All Materials Reliability Program (MRP-227, Revision 1-A: Pressurized Water Reactor Internals Inspection and Evaluation Guidelines) and Inservice Inspection Program reactor vessel internals inspections |
| Replace all thirty-six (36) Incore Instruments |
| Complete the Containment Integrated Leak Rate (Type A) Test in accordance with 10CFR Part 50, Appendix J |
| Update the Reactor Vessel Embrittlement Calculation to show remaining service life is beyond 2054 to support subsequent license renewal |
| Replace the Auxiliary Building Elevator cab, rails, controls, wiring and support subsystems |
| Replace the Service Building Elevator cab, rails, controls, wiring and support subsystems |
| Replace the Service Building Annex Elevator cab, rails, controls, wiring and support subsystems |
| Complete Conceptual Design study for new Control Rod Drive Seal Design and determine if pursuit of concept testing will be pursued |

| Activity |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Design and construct an onsite fireproof document vault |
| Restore the site cafeteria to functional service |
| Design and implement a Radio Frequency Identification (RFID) tracking system for repairable assets and tools |
| Identify and procure needed rolling stock such as forklifts, trucks, trailers, tractors, mowers, snowplows, etc. A bounding estimate of 50 additional rolling stock units above and beyond the baseline (decommissioning) quantity is expected to support Palisades Restart. |
| Consolidate, ship, and digitize (OCR Scan) plant hard-copy records including stress packages, vendor manuals, and film cartridges |
| Update and restore site procedures to support plant operation and maintenance including administrative, work control, engineering, licensing, maintenance, and operational procedures |
| Update the Main Steam Line Break evaluation methodology for reactor fuel design and submit the License Amendment Request (LAR) for NRC review |

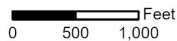


Legend

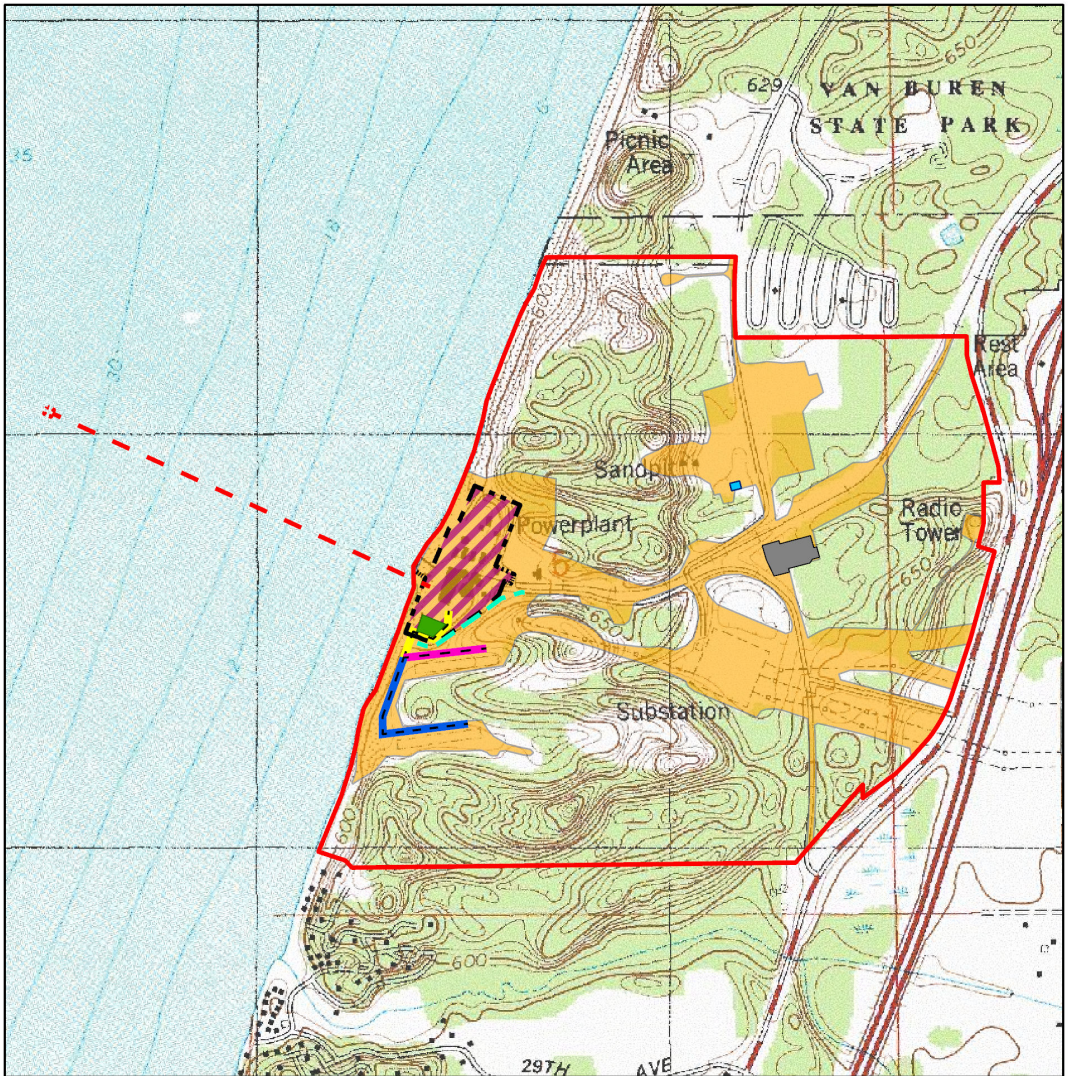
- Security Fence Installation Project
- Alpha & Bravo Plastibeton (Cable Tray Project)
- Alpha Cooling Tower Plastibeton (Cable Tray Project)
- Bravo Cooling Tower Plastibeton (Cable Tray Project)
- Access Road Disturbance Extent
- Intake
- PNP Approximate Site Boundary

- /// Buried Piping Maintenance
- East Radwaste Storage Area
- South Radwaste Storage Facility
- Digital Staging Testing Building
- Previously Disturbed Acreage

Note: Disturbed project acreage may not include all areas disturbed for plant construction.



GEN-1 Figure 1a

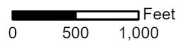


Legend

- Security Fence Installation Project
- Alpha & Bravo Plastibeton (Cable Tray Project)
- Alpha Cooling Tower Plastibeton (Cable Tray Project)
- Bravo Cooling Tower Plastibeton (Cable Tray Project)
- Access Road Disturbance Extent
- Intake
- PNP Approximate Site Boundary

- /// Buried Piping Maintenance
- East Radwaste Storage Area
- South Radwaste Storage Facility
- Digital Staging Testing Building
- Previously Disturbed Acreage




Note: Disturbed project acreage may not include all areas disturbed for plant construction.

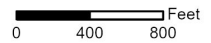


GEN-1 Figure 1b



Legend

-  PNP Approximate Site Boundary
-  Areas of Planned Restart Activities (including laydown) Approx. 64 acres
-  Previously Disturbed Acreage



GEN-1 Figure 2

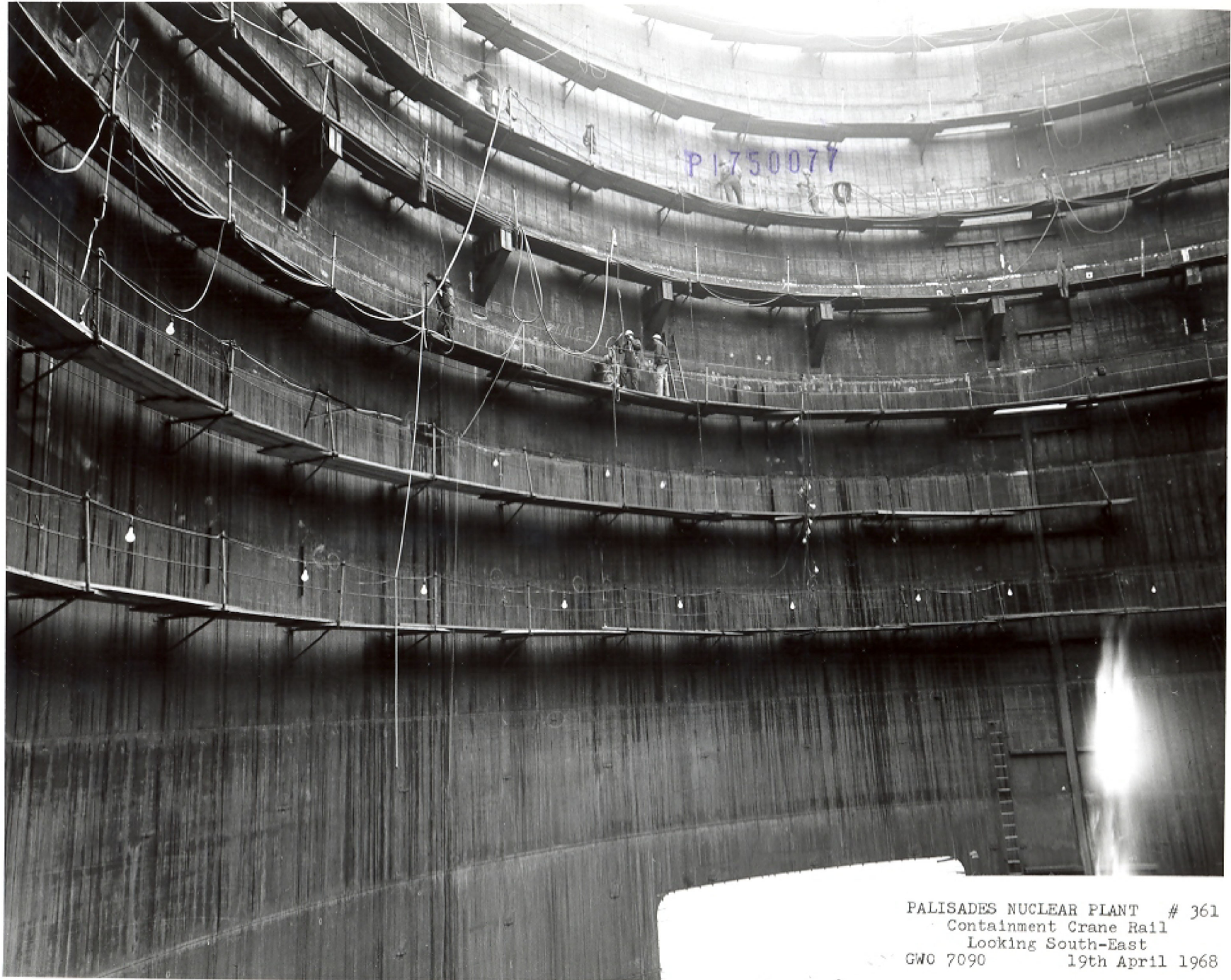
Enclosure 1
Attachment 2
HDI PNP 2024-037

HDI PNP 2024-037

Enclosure 1

Attachment 2 - Historical Photos

25 pages follow



PALISADES NUCLEAR PLANT # 361
Containment Crane Rail
Looking South-East
GWO 7090 19th April 1968



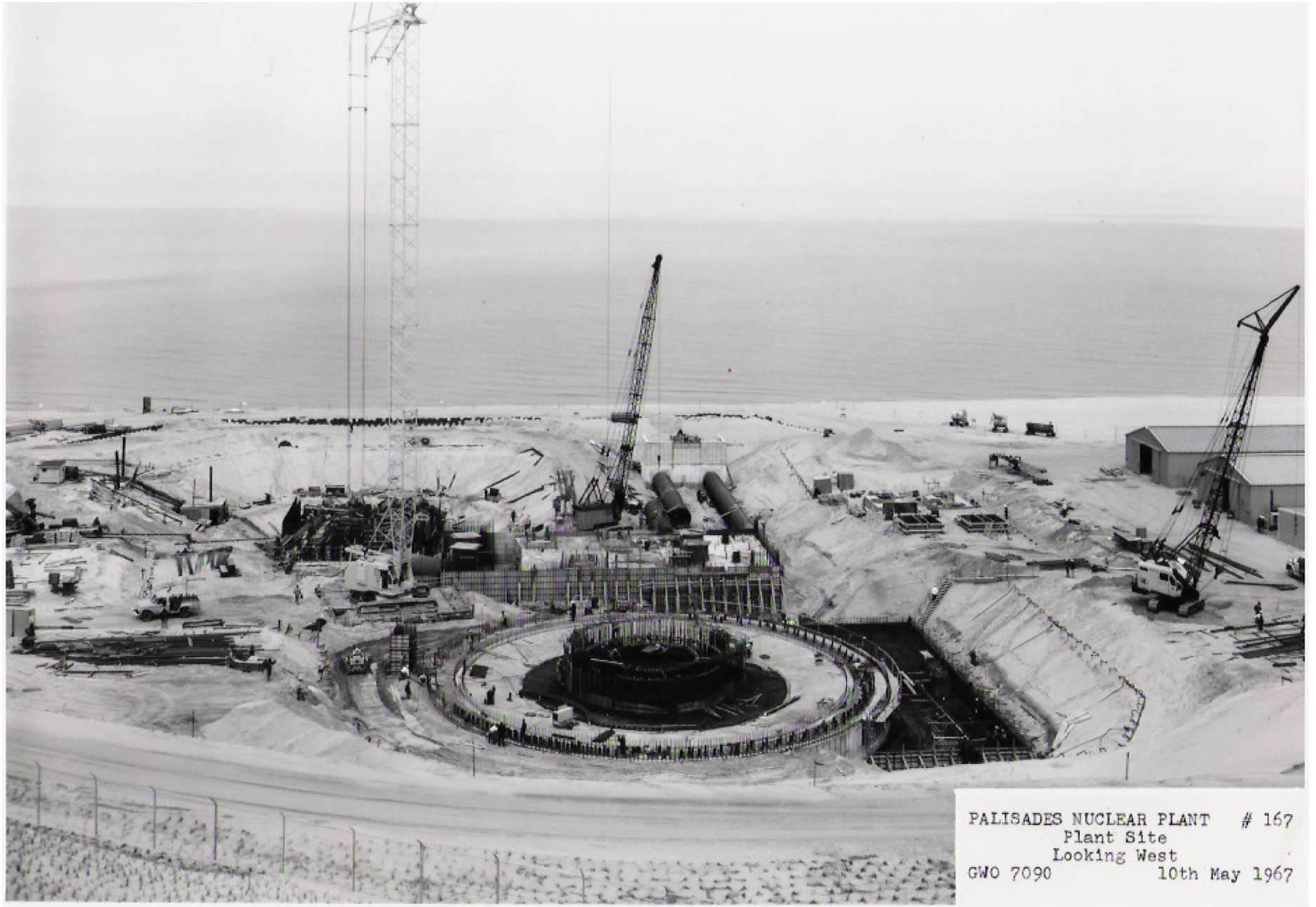
PALMER'S NUCLEAR PLANT # 23
Beach Disposal
North of The Plant Site
Looking North-West
GEO 7080 22nd September 1966





PALISADES NUCLEAR PLANT # 74
Parking lot A
Plant Site area
looking South-West
GPO 7090 8th December 1966



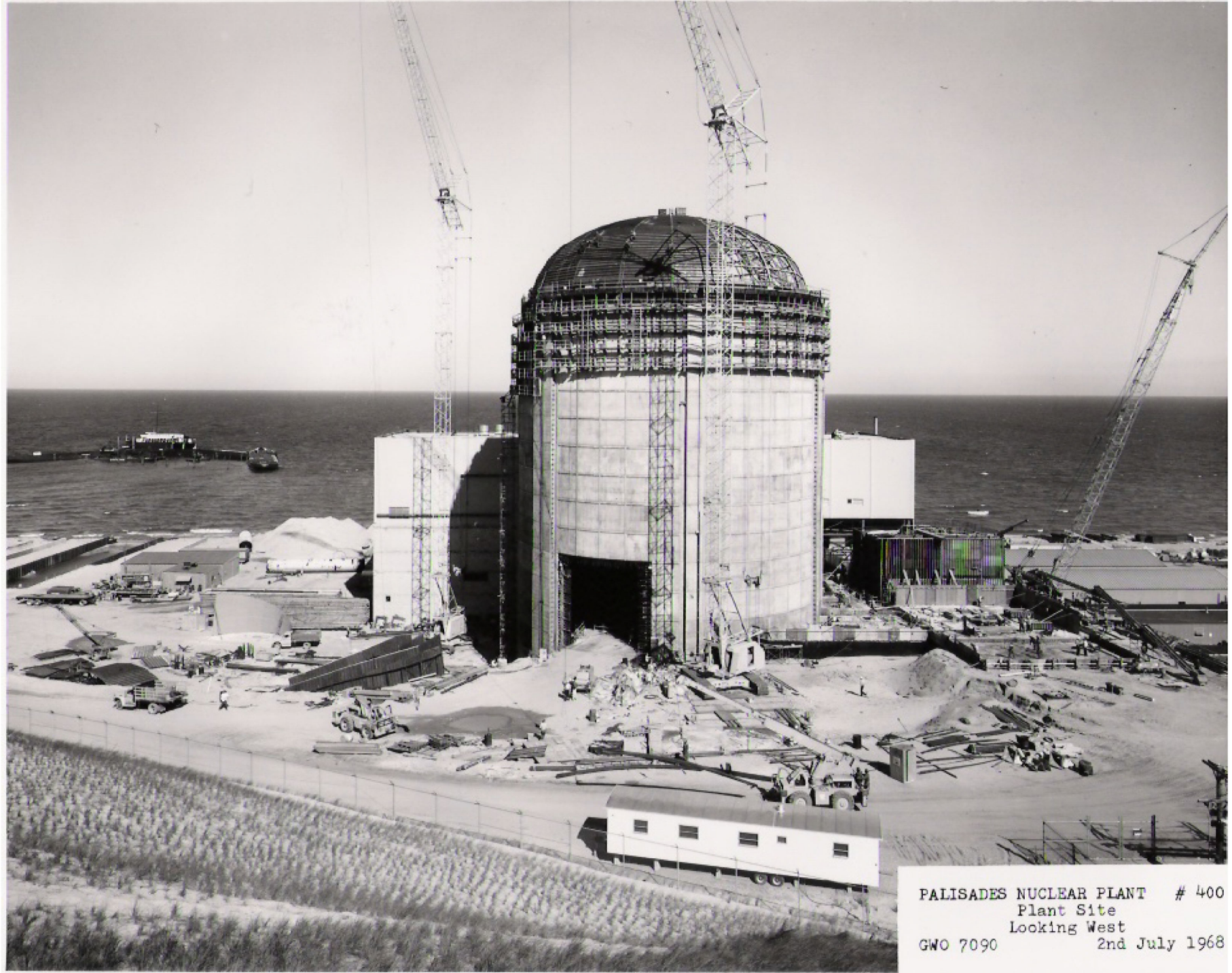


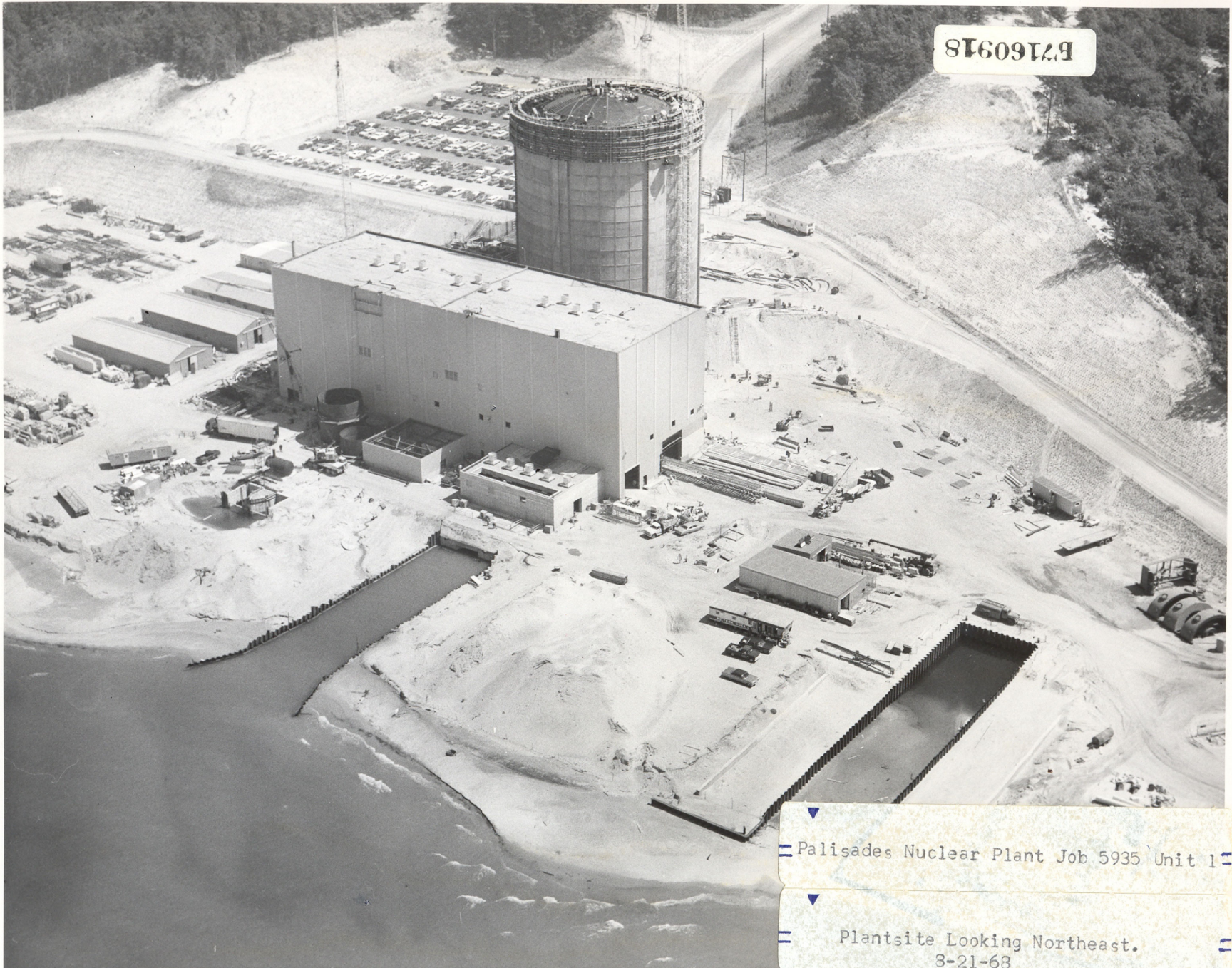
PALISADES NUCLEAR PLANT # 167
Plant Site
Looking West
GWO 7090 10th May 1967



PALISADES NUCLEAR PLANT # 223
Preparation For Base Slab
North Side Of Auxiliary Bldg.
Looking South-East
GWO 7090 31st August 1967



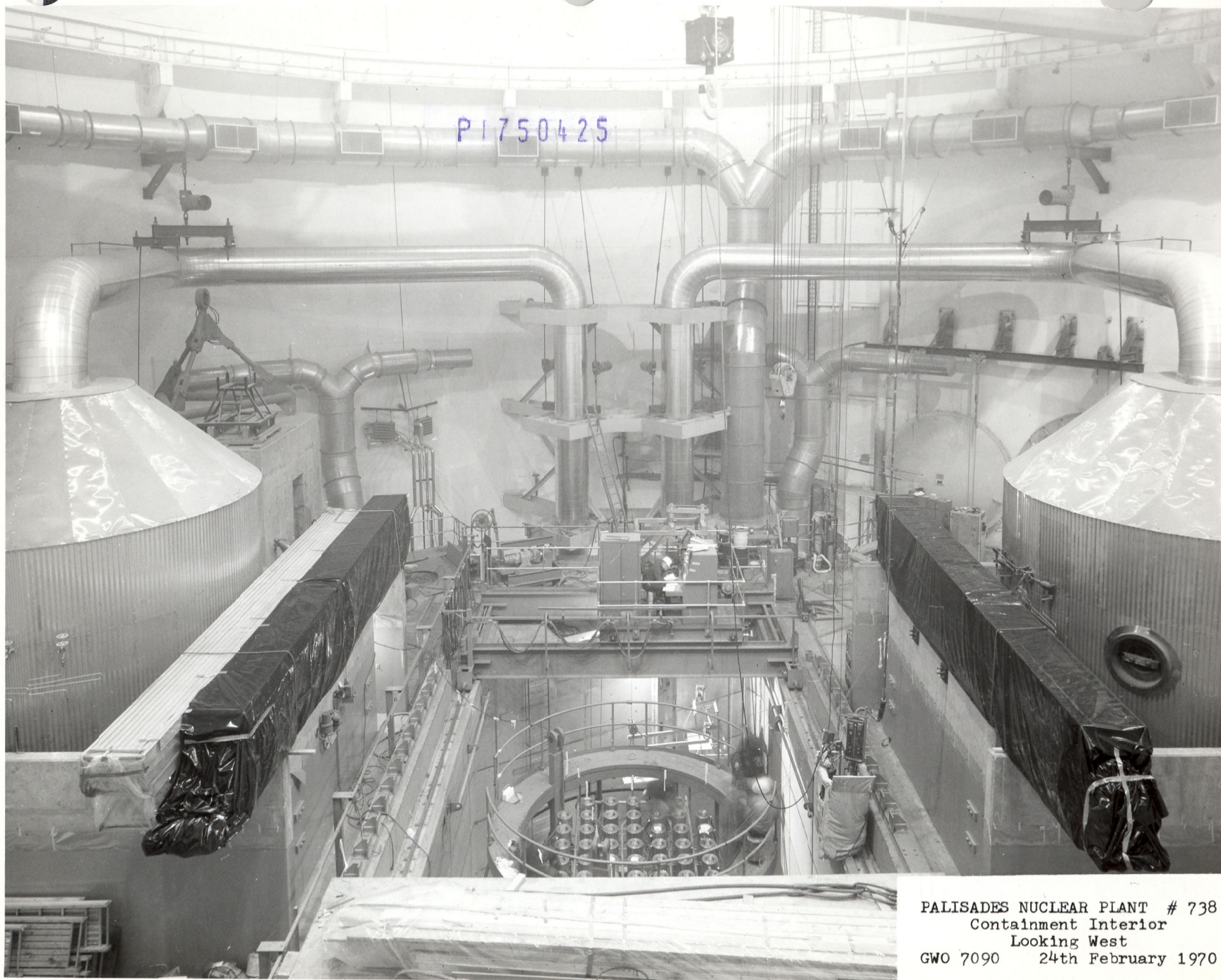




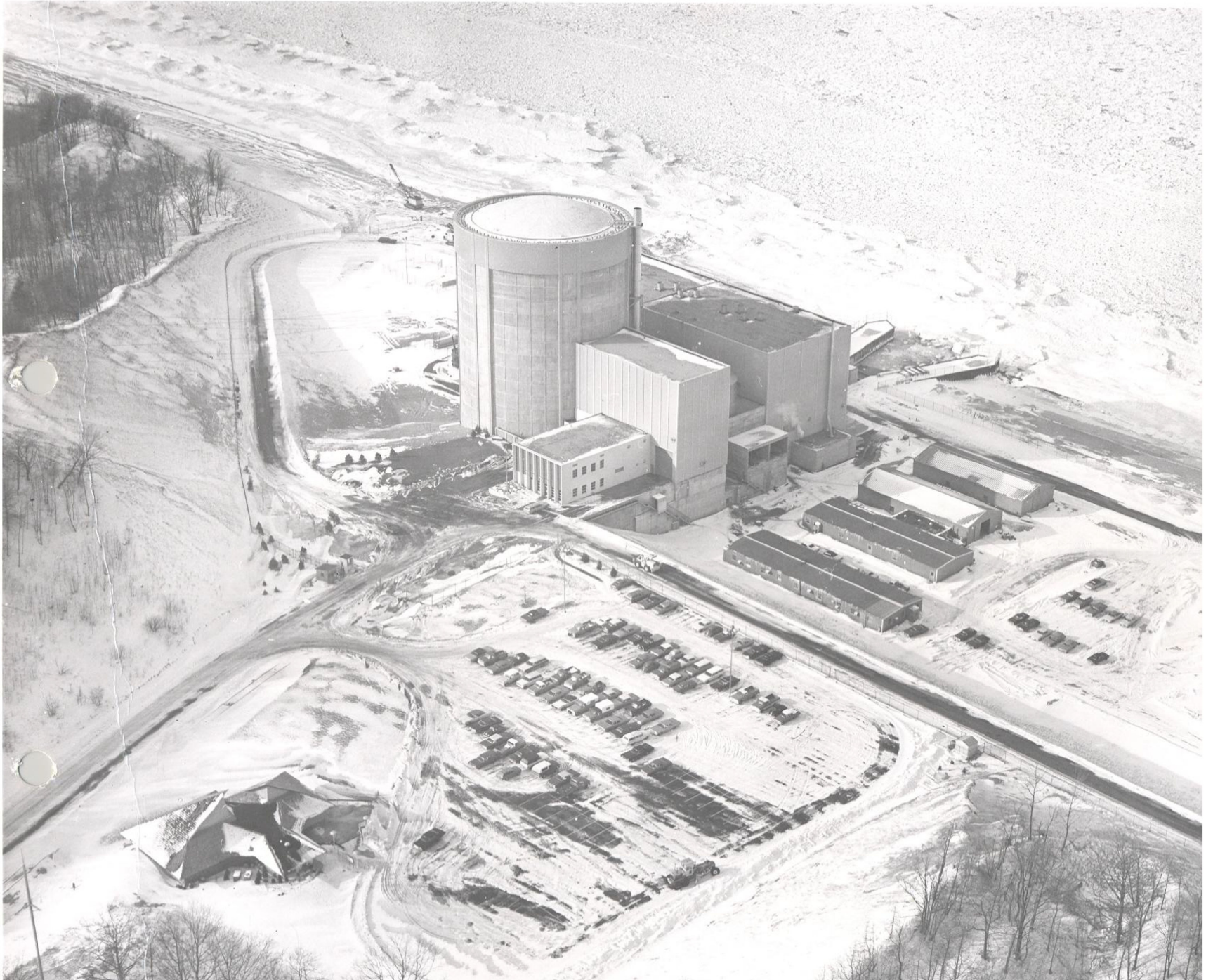
B7160918

Palisades Nuclear Plant Job 5935 Unit 1

Plantsite Looking Northeast.
3-21-68



PALISADES NUCLEAR PLANT # 738
Containment Interior
Looking West
GWO 7090 24th February 1970

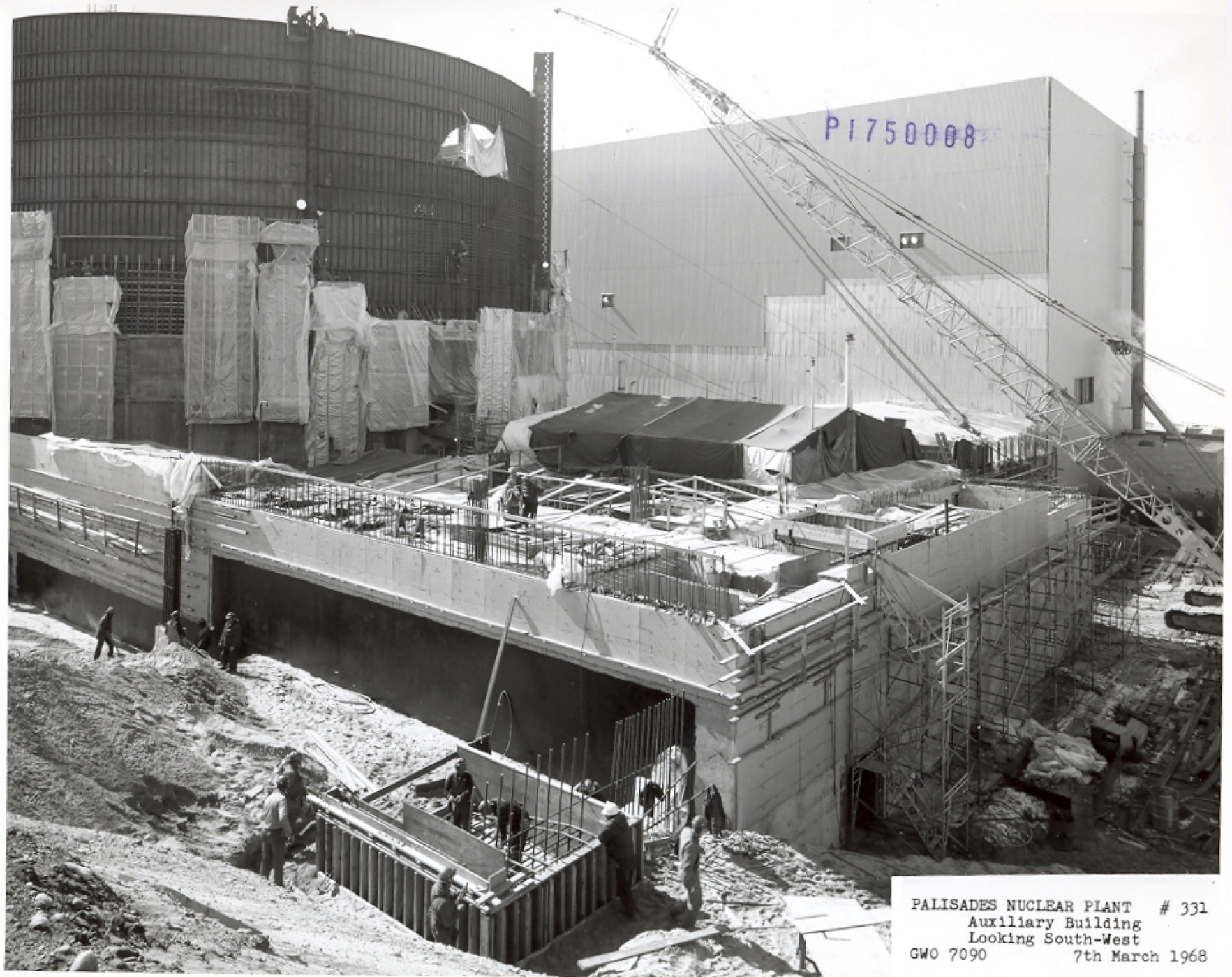




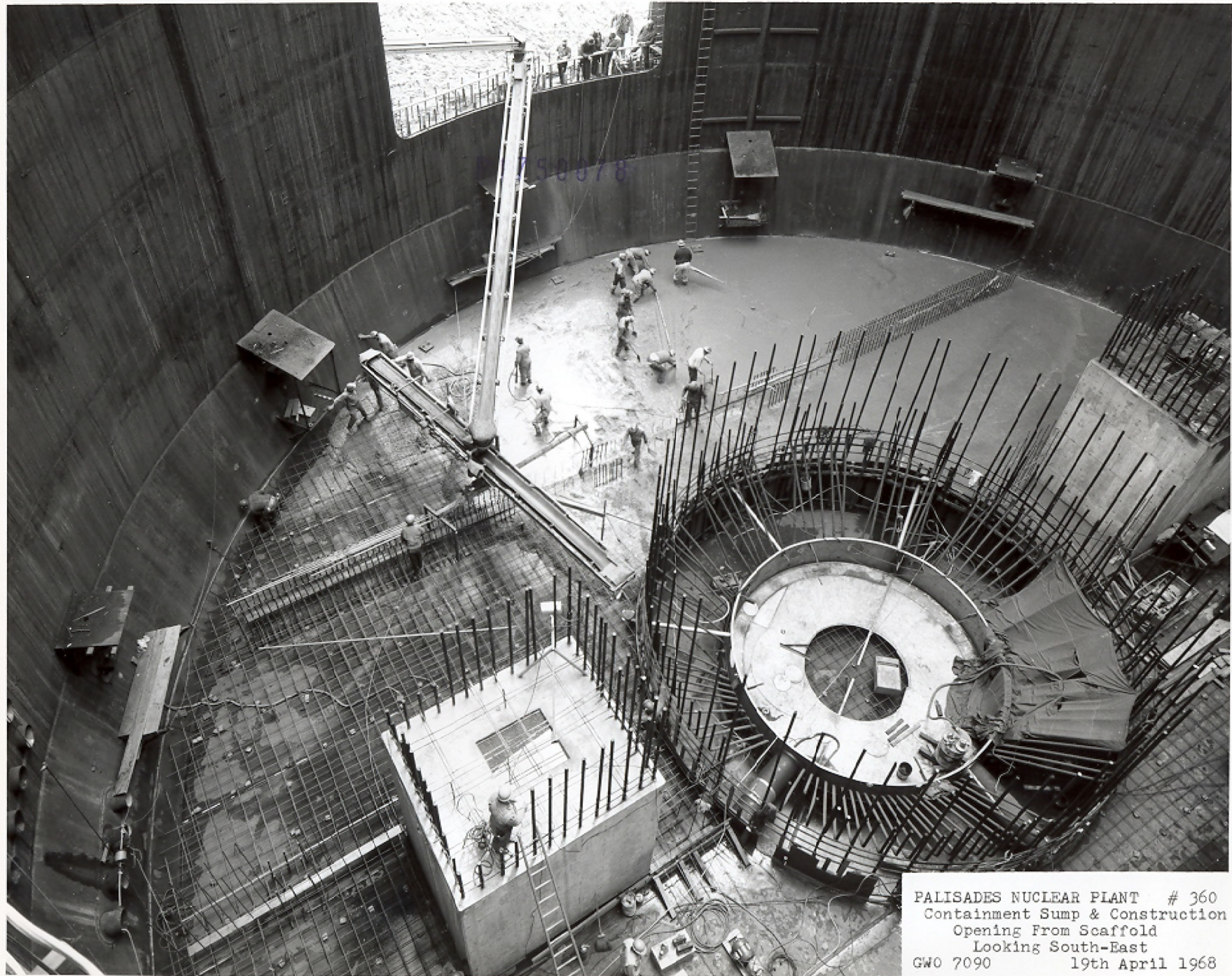


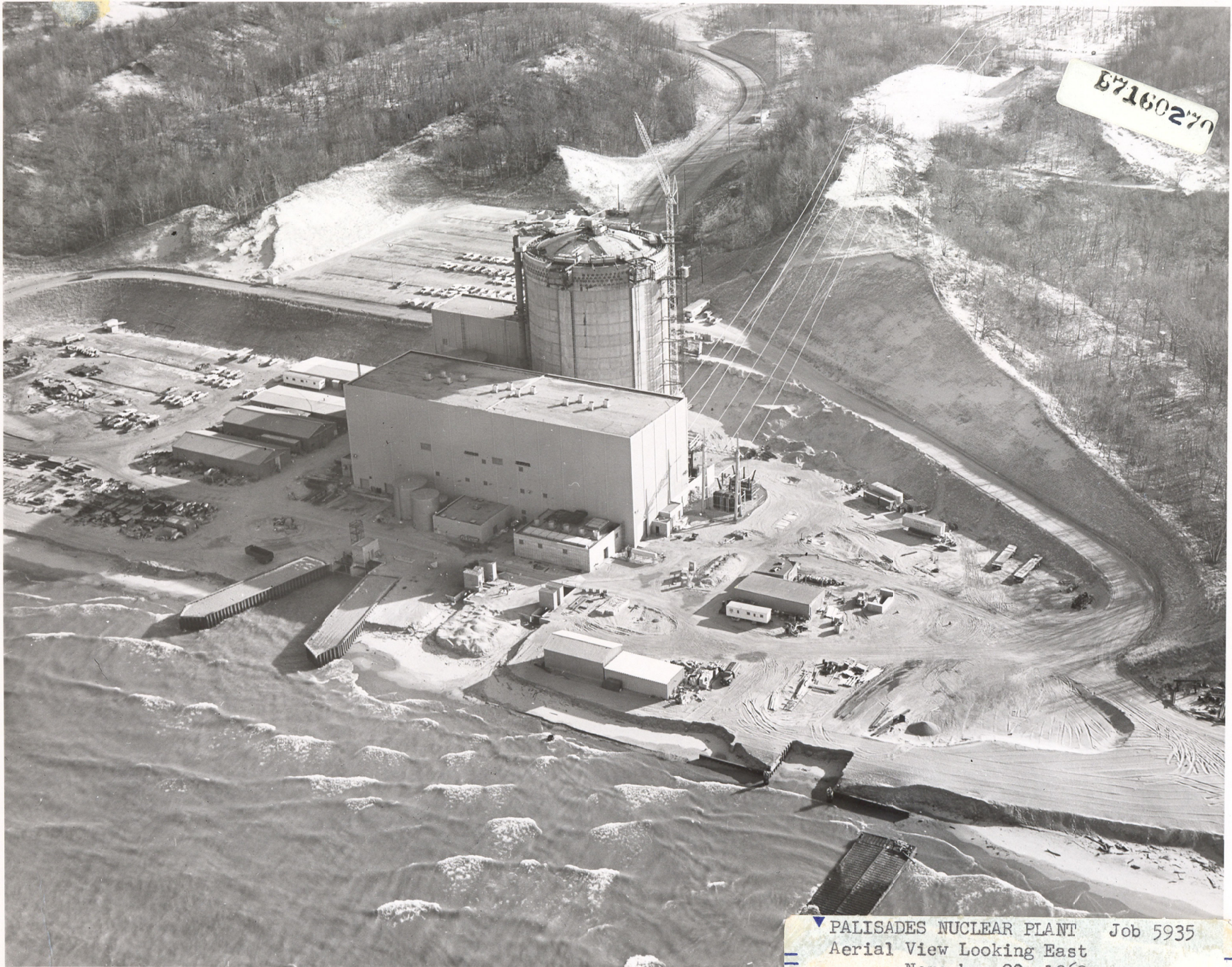
E7160741

PALISADES NUCLEAR PLANT Job 5935
Aerial View Looking Southeast.
June 28, 1969

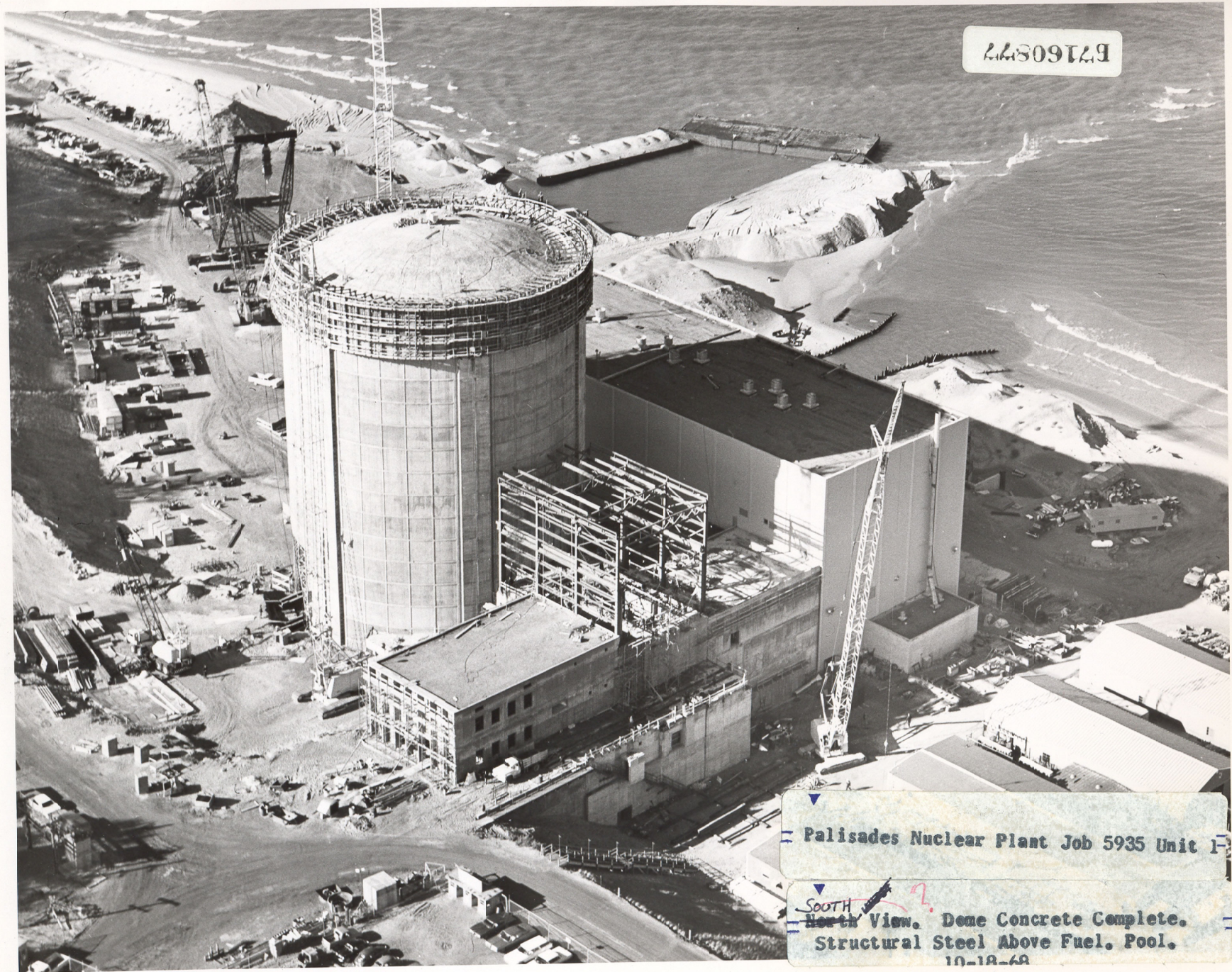


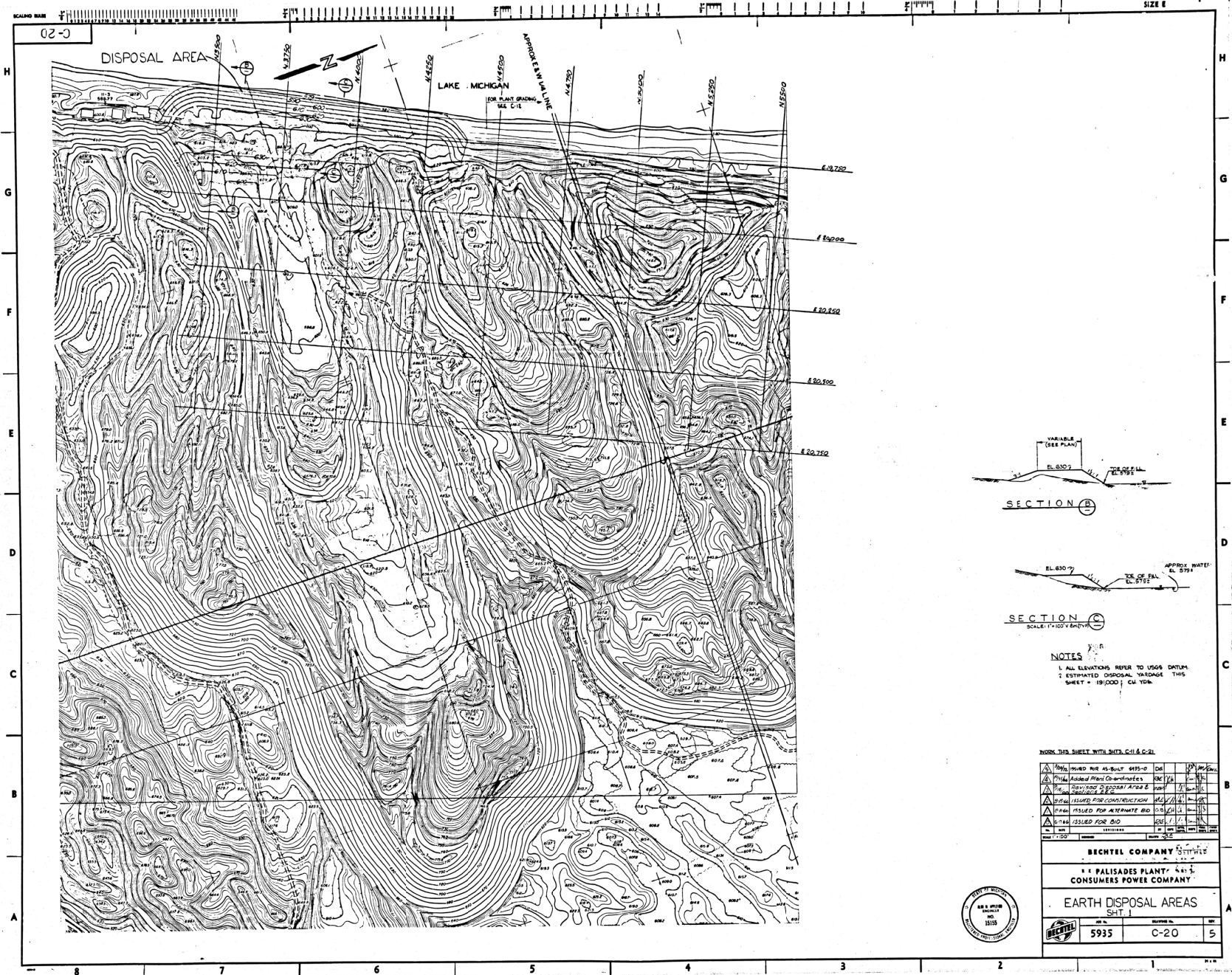
PALISADES NUCLEAR PLANT # 331
Auxiliary Building
Looking South-West
GWO 7090 7th March 1968

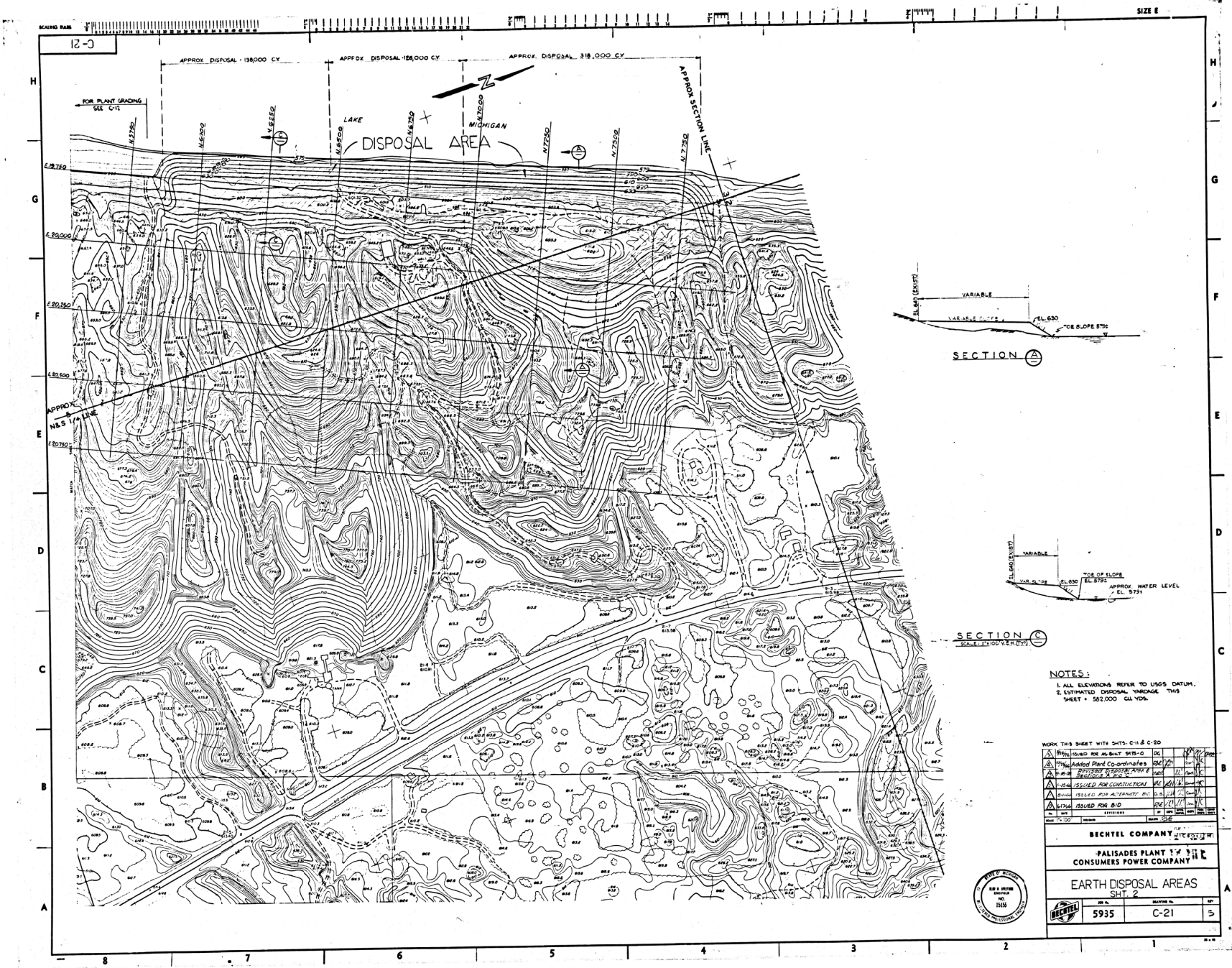




▼ PALISADES NUCLEAR PLANT Job 5935
Aerial View Looking East
November 22, 1969







SECTION A

SECTION C

NOTES:
 1. ALL ELEVATIONS REFER TO USGS DATUM.
 2. ESTIMATED DISPOSAL VOLUMES THIS SHEET = 582,000 CU YDS.

WORK THIS SHEET WITH SHEETS C-11 & C-20

| | | | |
|-------------------------|----------|-----------|-------|
| APPROX. SECTION A LINE | DATE | BY | CHKD. |
| ISSUED FOR CONSTRUCTION | 12/11/03 | W. J. ... | ... |
| ISSUED FOR ACTION | ... | ... | ... |
| ISSUED FOR A/D | ... | ... | ... |

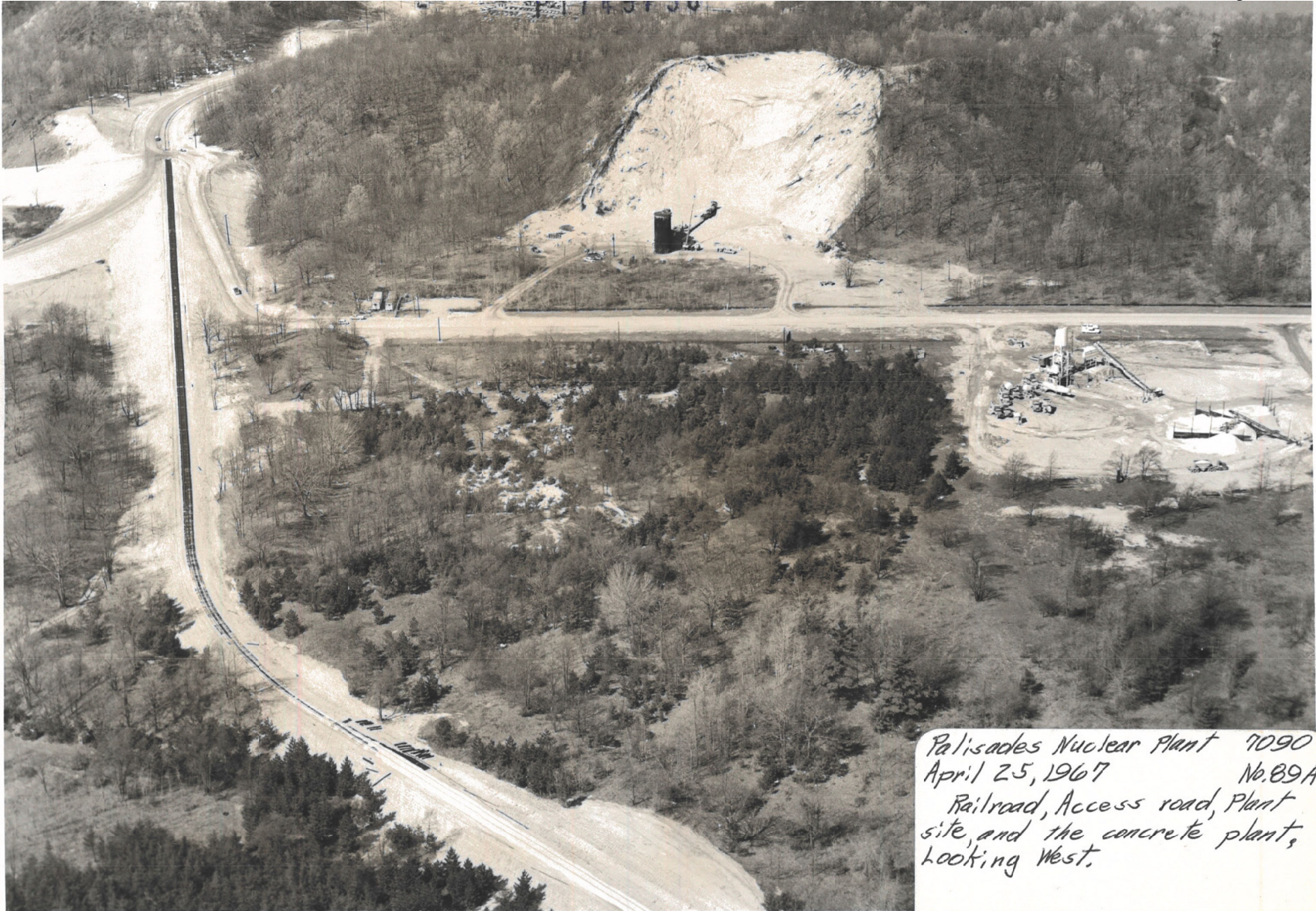
BECHTEL COMPANY
 PALISADES PLANT 1 & 2
 CONSUMERS POWER COMPANY
 EARTH DISPOSAL AREAS
 SH. 2

| | | |
|------|------|---|
| 5935 | C-21 | 5 |
|------|------|---|



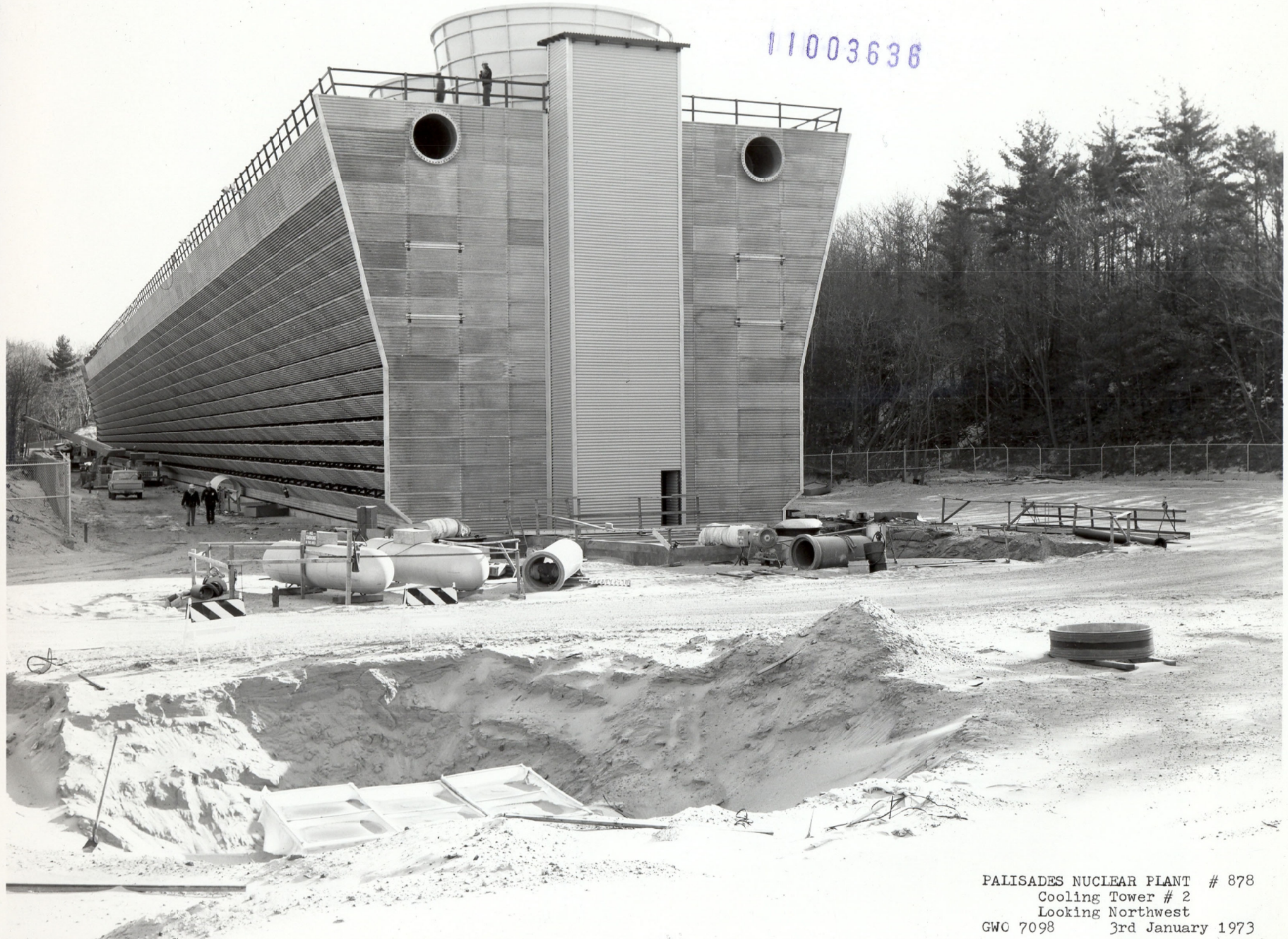


Palisades Nuclear Plant 7090
April 25, 1967 No. 06A
The lake is washing sand from
the south disposal area.



Palisades Nuclear Plant 7090
April 25, 1967 No. 89A
Railroad, Access road, Plant
site, and the concrete plant,
Looking West.

11003636



PALISADES NUCLEAR PLANT # 878
Cooling Tower # 2
Looking Northwest
GWC 7098 3rd January 1973



Palisades Nuclear Plant 7090
May 24, 1967 #100A
Plantsite. Looking South



Palisades Nuclear Plant Job 5935 Unit 1

Plantsite Looking East. Breakwater for Marine Work in Foreground.
6-20-68

Enclosure 1
Attachment 3
HDI PNP 2024-037

HDI PNP 2024-037

Enclosure 1

Attachment 3 - Cooling Tower Power Cable Replacement

5 pages follow

Alpha & Bravo Plastibeton
(2) 20"W x 16"D - 3 MV Cable Sets Each
(2) 4" Conduits with pull boxes - Future Controls etc.

HDI PNH 2024-037

Alpha Cooling Tower

Alpha Cooling Tower Plastibeton
(1) 20"W x 16"D - 3 MV Cable sets
Reduces to 2 Sets After LC-71,
Reduces to 1 Set After LC-73 to LC-75
(1) 4" Conduit with pull boxes - Future Controls etc.



Bravo Cooling Tower Plastibeton
(1) 20"W x 16"D - 3 MV Cable Sets
Reduces to 2 Sets After LC-72,
Reduces to 1 Set After LC-74 to LC-76
(1) 4" Conduit with pull boxes - Future Controls etc.

Bravo Cooling Tower

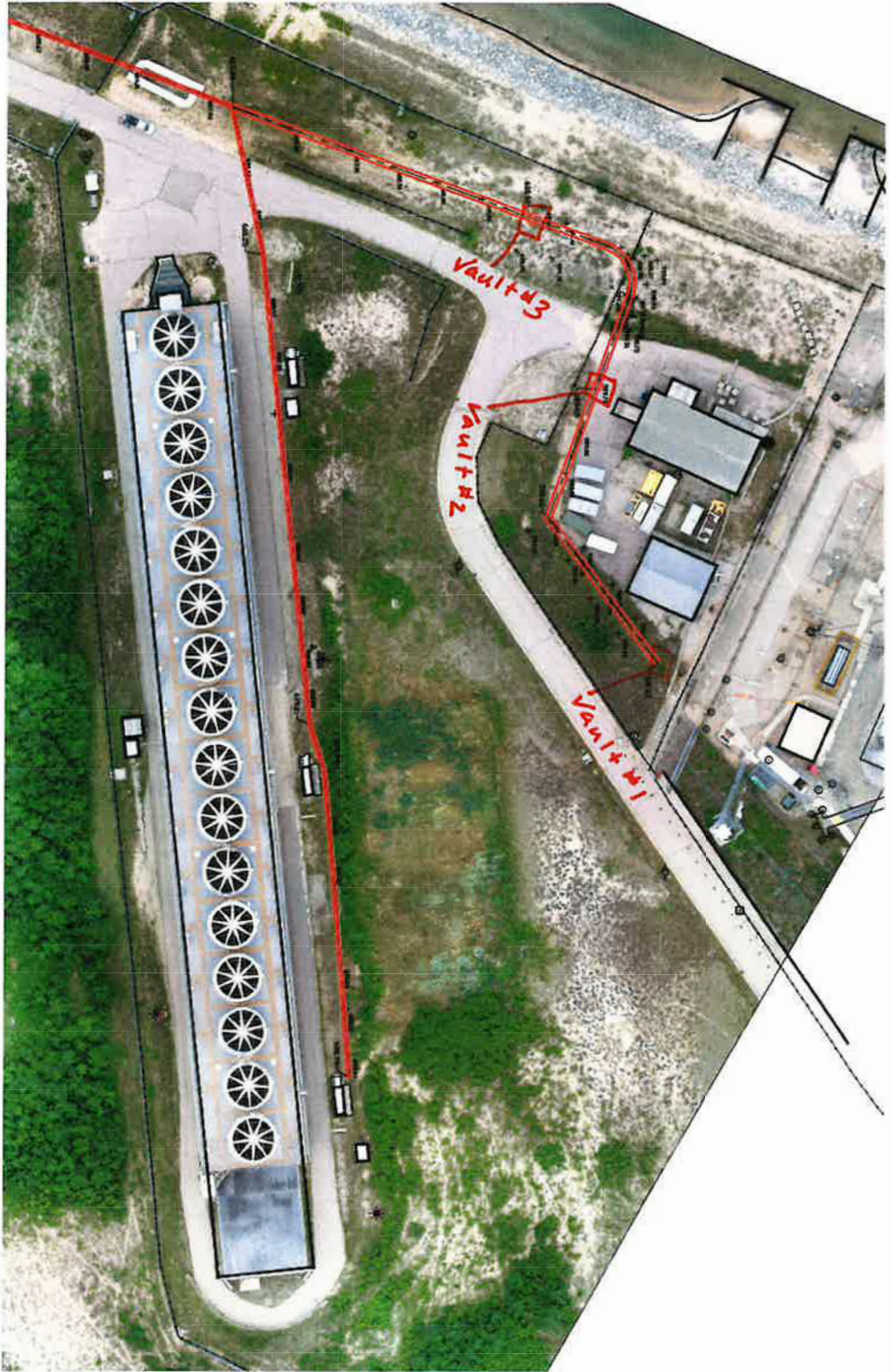




SCALE: 1"=20'
VERTICAL DATUM: NAVD 88

-  - FENCE
-  - ROUND CATCH BASIN

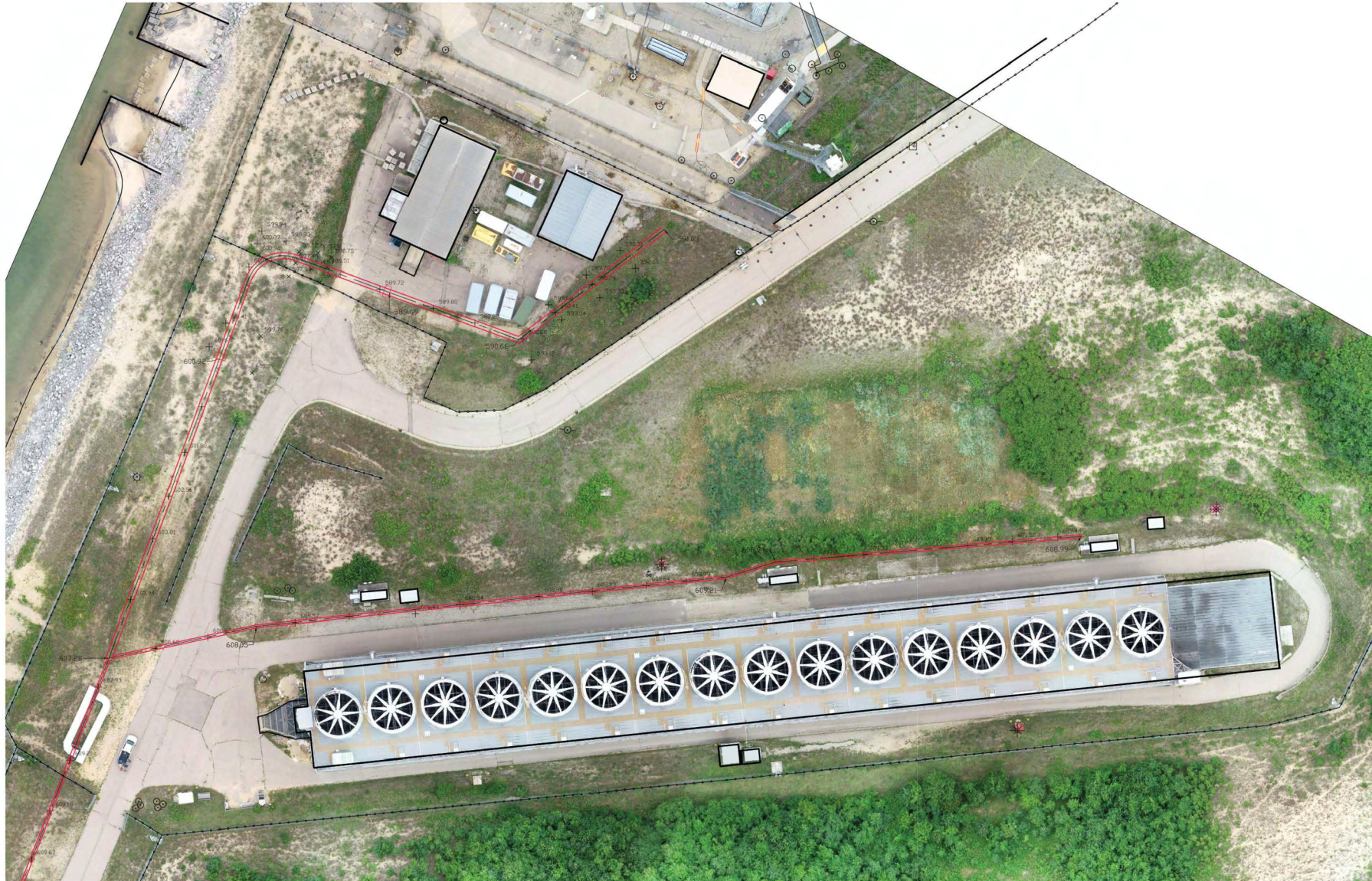
| | | | | | |
|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|--------------|----------|-----------|---------|
|  | MITCHELL & MORSE LAND SURVEYING 234 VETERANS BLVD. SOUTH HAVEN, MICHIGAN 49090 OFFICE: (269) 637-1107 FAX: (269) 637-1907 | | | | |
| | TOPOGRAPHIC SURVEY | | | | |
| PREPARED FOR: | NEWKIRK ELECTRIC ASSOCIATES | PROJECT NO.: | 24-641-B | DATE: | 8-12-24 |
| BOOK: | FILE: | PAGE: | FILE: | REVISION: | |
| DRAWN BY: | E. MORSE | SHEET: | 1 | OF: | 1 |



North

SCALE 1"=50'

| | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|---------------|----------------------------------------------------|
|  MITCHELL & MORSE LAND SURVEYING <small>201 WESTERN AVENUE, SUITE 200, GRAND RAPIDS, MI 49503 (269) 220-1117 FAX (269) 220-1187</small> | COOLING TOWER 15 kv FEEDERS | | PREPARED FOR: NEWKOR ELECTRIC ASSOCIATES |
| | PROJECT NO. 24-041 | DATE 7.2.2024 | |
| | BOOK 4-02 | PAGE 142 | REVISION |
| | DRAWN BY J. MORRIS | SHEET 1 | OF 2 |
| | | | |



SCALE 1"=30'



MITCHELL & MORSE LAND SURVEYING
215 OFFICE (260) 437-2107 FAX (260) 437-1807
215 HOME (260) 437-2107

COOLING TOWER 15 kV FEEDERS

PREPARED FOR: **NEWTRK ELECTRIC ASSOCIATES**
PROJECT NO. 24-011 DATE 7/2/2024
DRAWN BY: E. MORSE SHEET 1 OF 2



SCALE 1"=30'



MITCHELL & MORSE LAND SURVEYING
234
OFFICE (260) 637-2107 FAX (260) 637-1907



PREPARED FOR: NEWKIRK ELECTRIC ASSOCIATES
PROJECT NO. 24-051 DATE 7-2-2024
DRAWN BY: E. MORSE SHEET 1 OF 2

COOLING TOWER 15 kV FEEDERS

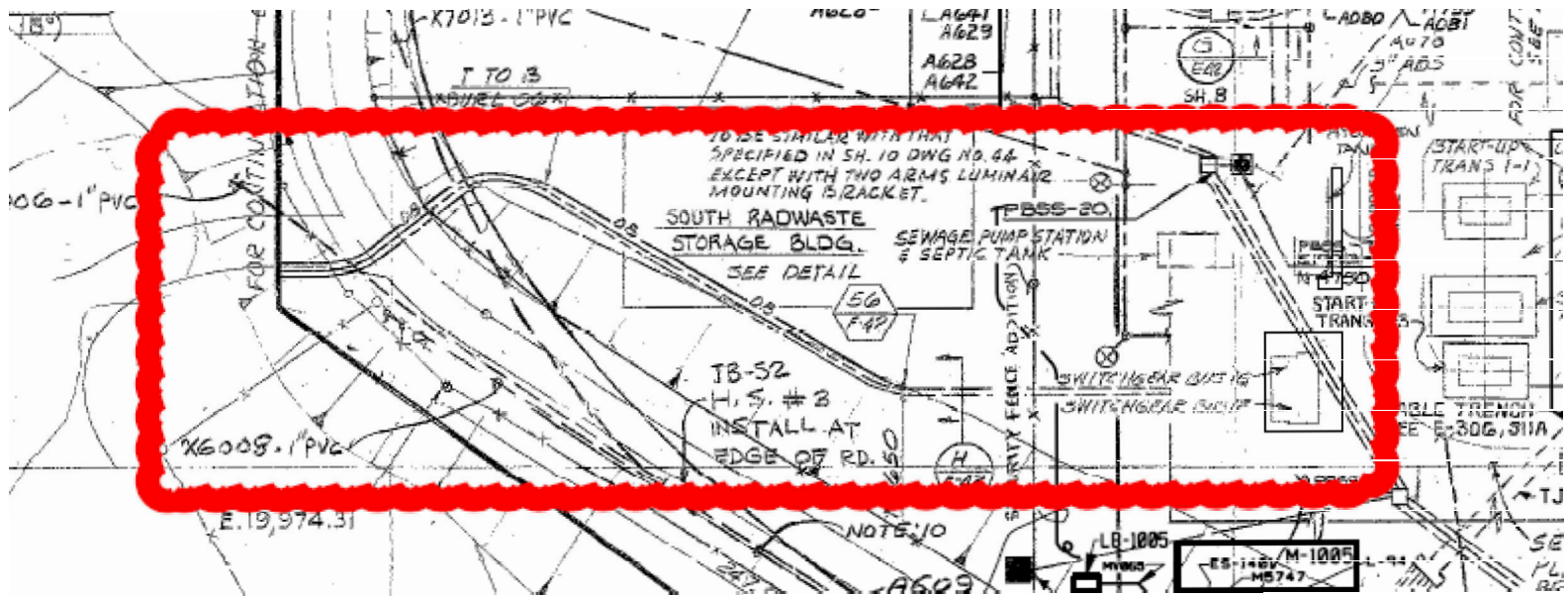
Enclosure 1
Attachment 4
HDI PNP 2024-037

HDI PNP 2024-037

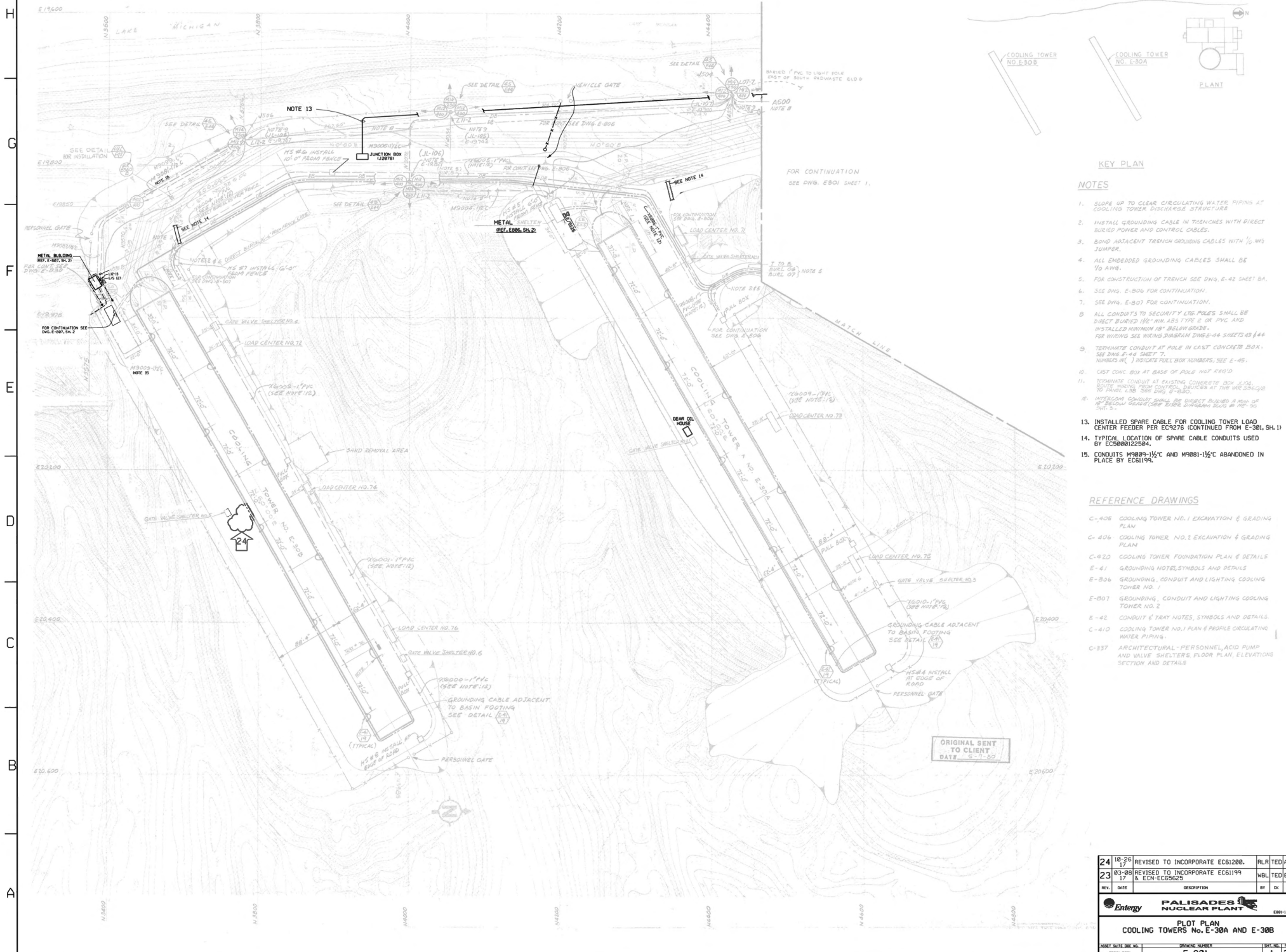
Enclosure 1

Attachment 4 - Existing Cooling Tower Cable Location

2 pages follow



Sourced from Drawing E-301, Rev. 73



KEY PLAN

NOTES

1. SLOPE UP TO CLEAR CIRCULATING WATER PIPING AT COOLING TOWER DISCHARGE STRUCTURE
2. INSTALL GROUNDING CABLE IN TRENCHES WITH DIRECT BURIED POWER AND CONTROL CABLES.
3. BOND ADJACENT TRENCH GROUNDING CABLES WITH 1/2" W/3 JUMPER.
4. ALL EMBEDDED GROUNDING CABLES SHALL BE 1/2" AWG.
5. FOR CONSTRUCTION OF TRENCH SEE DWG. E-42 SHEET DA.
6. SEE DWG. E-80W FOR CONTINUATION.
7. SEE DWG. E-80J FOR CONTINUATION.
8. ALL CONDUITS TO SECURITY LIGHT POLES SHALL BE DIRECT BURIED 1/2" MIN. ABS TYPE 2 OR PVC AND INSTALLED MINIMUM 18" BELOW GRADE. FOR WIRING SEE WIRING DIAGRAM DWG E-44 SHEETS 43 & 44
9. TERMINATE CONDUIT AT POLE IN CAST CONCRETE BOX. SEE DWG. E-44 SHEET 7. NUMBER (X, Y) INDICATE PULL BOX NUMBERS. SEE E-85.
10. CAST CONC. BOX AT BASE OF POLE NOT REQUIRED.
11. TERMINATE CONDUIT AT EXISTING CONCRETE BOX 21/2" TO 1/2" MIN. ABS TYPE 2 OR PVC AND INSTALLED MINIMUM 18" BELOW GRADE. FOR WIRING SEE WIRING DIAGRAM DWG E-44 SHEETS 43 & 44
12. INTERLOCK CONDUIT SHALL BE DIRECT BURIED A MIN OF 18" BELOW GRADE (SEE WIRING DIAGRAM DWG E-44 SHEET 43 & 44)
13. INSTALLED SPARE CABLE FOR COOLING TOWER LOAD CENTER FEEDER PER EC9276 (CONTINUED FROM E-301, SH. 1)
14. TYPICAL LOCATION OF SPARE CABLE CONDUITS USED BY EC6080122504.
15. CONDUITS M9889-1/2" C AND M9881-1/2" C ABANDONED IN PLACE BY EC61199.

REFERENCE DRAWINGS

- C-408 COOLING TOWER NO. 1 EXCAVATION & GRADING PLAN
- C-406 COOLING TOWER NO. 2 EXCAVATION & GRADING PLAN
- C-420 COOLING TOWER FOUNDATION PLAN & DETAILS
- E-41 GROUNDING NOTES, SYMBOLS AND DETAILS
- E-806 GROUNDING, CONDUIT AND LIGHTING COOLING TOWER NO. 1
- E-801 GROUNDING, CONDUIT AND LIGHTING COOLING TOWER NO. 2
- E-42 CONDUIT & TRAY NOTES, SYMBOLS AND DETAILS
- C-410 COOLING TOWER NO. 1 PLAN & PROFILE CIRCULATING WATER PIPING
- C-337 ARCHITECTURAL PERSONNEL ACID PUMP AND VALVE SHELTERS FLOOR PLAN, ELEVATIONS SECTION AND DETAILS

ORIGINAL SENT TO CLIENT DATE 11-11-02

| | | | | | |
|------------------------------------------------|----------|---------------------------------------------|----------|----------------------------|-----|
| 24 | 10-26-17 | REVISED TO INCORPORATE EC61200. | RLR | TED | ACB |
| 23 | 03-08-08 | REVISED TO INCORPORATE EC61199 & EC-EC65820 | WBL | TED | BHS |
| REV. | DATE | DESCRIPTION | BY | CHK | APP |
| | | | ERM-1511 | | |
| PLT PLAN COOLING TOWERS No. E-30A AND E-30B | | | | | |
| SHEET SCALE 3/8" = 1' ERM-1511 | | DRAWING NUMBER E-801 | | SHEET NO. / REV. 1 / 24 | |

Enclosure 2
HDI PNP 2024-037

Enclosure 2
HDI PNP 2024-037
Response to Request for Additional Information –
RAI-GEN-2
Regarding the Proposed Reauthorization of Power Operations of
Palisades Nuclear Plant Under
Renewed Facility Operating License No. DPR-20

NRC RAI Number: RAI-GEN-2

Provide a properly-supported purpose and need statement for the proposed Federal actions. Include any applicable related analyses and studies informed by HDI's purpose and need statement, e.g., alternatives.

The purpose and need statement is the foundation of the environmental analysis on which the rest of the environmental assessment is built. Enclosure 2, "Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant", did not provide a National Environmental Policy Act (NEPA)-based purpose and need statement – while the submittals describe the project and purposes, an overall purpose and need statement as it relates to the NEPA analysis is needed for the lead agency to respond to the proposed Federal actions before them. That is, a purpose and need statement should be provided that briefly specifies the underlying purpose and need to which the agency is responding as it provides the foundation for determining which alternatives will be considered. A properly-supported purpose and need statement, which should incorporate the applicant's objectives and not be too narrowly defined, provides a focused limit on the range of alternatives to be considered and allows an agency to dismiss without detailed study any alternative that fails to meet the proposed purpose and need.

In requesting this information, the NRC is guided by the following Council on Environmental Quality (CEQ) regulations:

- Title of 40 of the *Code of Federal Regulations* (40 CFR) Part 1501.5 requires EAs to briefly describe the purpose and need for the proposed agency action.

HDI Response to RAI:

The purpose and need for the proposed action (for an exemption of 10 CFR 50.82(a)(2) by allowing a one-time rescission of the docketed 10 CFR 50.82(a)(1) certification and NRC approval of an order to transfer operational authority of Palisades and amendments necessary to reinstate the Palisades Renewed Facility Operating License, which will result in Palisades formally exiting the decommissioning process and entering a second period of power operation) is to provide an option that allows for clean energy baseload power generation capability within the term of the current nuclear power plant operating license to meet current (from restart through March 24, 2031) system generating needs.

As documented in a Holtec Decommissioning International, LLC (HDI) letter to the U.S. Nuclear Regulatory Commission (NRC), Request for Exemption from Certain Termination of License Requirements of 10 CFR 50.82 (NRC ADAMS Accession Number ML23271A140), the Governor of the State of Michigan wrote in an April 20, 2022, letter and a September 9, 2022, letter to the United States Secretary of the Department of Energy, that allowing for the resumption of power operations at Palisades is a top economic and clean energy priority and is critical for Michigan's competitiveness and future economic development opportunities. Michigan's federal and state representatives have also issued letters regarding support for PNP resumption of operations. The letters are provided in Attachments 1 and 2.

Governor Whitmer's letters emphasize PNP as contributing to Michigan's focus on clean energy. Subsequent to the Governor's 2022 letters, Michigan passed a Clean Energy Future Package of legislation. Included in the package was Senate Bill 271 which sets an 80 percent clean energy standard by 2035 and a 100 percent clean energy standard by 2040. Senate Bill 271 was signed by Governor Whitmer and the clean energy standards were incorporated in Public Act 2023 with an effective date of 2024. It is publicly available at the following web address: <<https://www.legislature.mi.gov/documents/2023-2024/publicact/pdf/2023-PA-0235.pdf>>. Public Act 2023 includes nuclear generation as a clean energy system.

Regarding the Michigan Integrated Resource Planning (IRP) requirements and the state's Certificate of Convenience and Necessity process inquiries from NRC during the onsite audit, the following information prepared by Wolverine Power Cooperative is provided:

Neither a Certificate of Need (or similar) permit or license (collectively, a "CON") or an Integrated Resource Plan ("IRP") approval is required for Wolverine's long-term PPA commitment to Holtec related to Palisades.

I. Michigan's Integrated Resource Planning Requirement Does Not Apply to Wolverine (or its Members).

In 2016, the Michigan Legislature created Michigan's first IRP process/requirement. MCL 460.6t(3) requires that an IRP be submitted and approved on a prescribed timeline, but this requirement only applies to "electric utility[ies] whose rates are regulated by the commission." Neither Wolverine nor its Members' rates are regulated by the Commission. Wolverine is not an "electric utility" under Michigan law (MCL 460.10h(c); MCL 460.562(e)) and Wolverine's Members' rates are NOT regulated by the Commission. (See Michigan's Electric Cooperative Member- Regulation Act; MCL 460.31 et seq.) Supporting both conclusions is the Michigan Commission Order in Case No. U-18461, which establishes IRP covered entities and timelines – notably and intentionally omitting Wolverine and its Members. The U-18461- 0015 file is publicly retrieved at <<https://mi-psc.my.site.com/s/case/500t0000008eg4GAAQ/in-the-matter-on-the-commissions-own-motion-implement-the-provisions-of-section-6t-of-2016-pa-341>>.

II. Michigan's Certificate of Necessity is only a Requirement under the Inapplicable IRP Process.

While Michigan has a process for Certificates of Necessity associated with generation assets, it is permissive and not required. Relevantly, while the size, length and price of the Holtec-Palisades PPA would fit into this CON statute, the statute specifically states that an "electric utility" "**may** submit an application to the commission." MCL 460.6s(1) (emphasis added). A CON is ONLY required, however, in limited cases under the inapplicable IRP statute (see above). MCL 460.6t(13).

In summary, because (1) CON filing is permissive; (2) Wolverine is not an electric utility; and (3) the IRP process is inapplicable to Wolverine and its Members – there is no CON required for the Holtec-Palisades PPA obligation.

References:

None.

Associated Attachments:

1. Michigan State Representatives Letter to Governor Whitmer
2. U.S. Congressmen Letter to DOE and NRC

Enclosure 2
Attachment 1
HDI PNP 2024-037

HDI PNP 2024-037

Enclosure 2

Attachment 1 - Michigan State Representatives Letter to Governor Whitmer

3 pages follow



39TH DISTRICT
STATE CAPITOL
P.O. BOX 30014
LANSING, MI 48909-7514

MICHIGAN HOUSE OF REPRESENTATIVES
PAULINE WENDZEL
STATE REPRESENTATIVE

PHONE: (517) 373-1799
FAX: (517) 373-8361
PaulineWendzel@house.mi.gov
www.RepWendzel.com

May 25, 2023

The Honorable Gretchen Whitmer
Governor of the State of Michigan
PO Box 30013
Lansing, MI 48909

Dear Governor:

As members of Michigan's newly formed bipartisan, bicameral Nuclear Caucus, we are writing to express our appreciation for your support of PA 218 of 2022. We're confident that at the conclusion of the study, the report will confirm what our members know to be true – that nuclear power is safe, carbon-free, reliable, and should be a prominent fixture in Michigan's energy future.

We also are writing to express our appreciation in your leadership and assure you of our full support and partnership as your administration continues negotiating with our Federal partners, Holtec, and other stakeholders regarding the re-opening of the Palisades Nuclear Power Plant.

At full capacity, this plant provided over 800-megawatts of carbon free, baseload electricity that powered over half a million Michigan homes. Furthermore, it employed over 600 hardworking people in good, high-paying careers, making a substantial positive economic impact on the regional economy. In addition, Palisade's annual tax contributions of over \$10 million have been crucial in supporting essential public services and the local schools of a small majority-minority community on the banks of Lake Michigan.

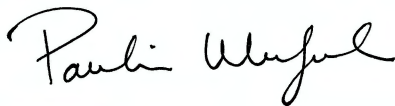
Since the closure of Palisades, the effects have been felt not only in Covert but throughout the entire Southwest Michigan region and the state as a whole. However, amidst these challenges lies a unique bipartisan opportunity waiting to be seized. Michigan has always been a hub of technological innovation, from the automotive industry's pioneering efforts in Detroit to our leadership in electric and autonomous vehicle revolution. Now, we have the chance to make history by successfully re-powering a non-operational nuclear power plant, becoming the first state in American history to accomplish such a feat.

The successful re-powering of Palisades would immediately provide safe, carbon-free, and reliable energy to a grid that desperately needs more baseload generation. Palisades would be a successful

model whose re-opening would positively reverberate around the world, fueled by Michigan's unwavering grit, innovation, and determination.

As your administration continues its work, please don't hesitate to use us, your legislative partners, as a valuable resource. We stand ready, willing, and able, to provide our support, expertise, and collaboration to shape not only Michigan's energy future, but the world's. Working together, we can lay the foundation for a sustainable and prosperous Michigan and cement our state's place in American history.

Sincerely,



Pauline Wendzel
State Representative
39th House District



Joey Andrews
State Representative
38th House District



Helena Scott
State Representative
7th House District



Sean McCann
State Senator
19th Senate District



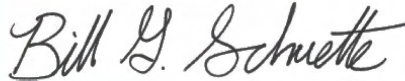
Dan Lauwers
State Senator
25th Senate District



Pat Outman
State Representative
91st House District



Douglas Wozniak
State Representative
59th House District



Bill G. Schuette
State Representative
95th House District



Kathy Schmaltz
State Representative
46th House District



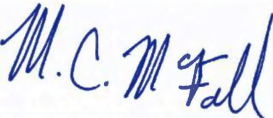
Graham Filler
State Representative
93rd House District



Tom Kunse
State Representative
100th House District



Bradley Slagh
State Representative
85th House District



Mike McFall
State Representative
8th House District



Jaime Greene
State Representative
65th House District



Luke Meerman
State Representative
89th House District



Sharon MacDonell
State Representative
56th District



Timothy Beson
State Representative
96th District

Enclosure 2
Attachment 2
HDI PNP 2024-037

HDI PNP 2024-037

Enclosure 2

Attachment 2 – U.S. Congressmen Letter to DOE and NRC

2 pages follow

Congress of the United States
Washington, DC 20515

December 15, 2023

The Honorable Jennifer M. Granholm
Secretary
U.S. Department of Energy
1000 Independence Ave., SW
Washington, DC 20585

The Honorable Christopher T. Hanson
Chair
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Secretary Granholm and Chair Hanson:

We write on behalf of the federal loan funding application submitted by Holtec to repower the Palisades Nuclear Power Plant in Covert, Michigan. Building upon the list of private and public stakeholders on the state and local community level that have already backed this project, Holtec is now seeking federal support. Repowering Palisades could significantly grow the region's economy, strengthen our domestic energy security, and return safe, reliable, and carbon-free generation back to the electrical grid.

Restoring Palisades' 800 megawatts of baseload generation, which is sufficient to reliably power more than 800,000 homes with clean energy, would be critical to addressing our nation's fast-growing energy needs. In addition to clear energy benefits, Palisades has the potential to directly drive economic growth and create hundreds of highly skilled jobs, including a union workforce and long-term opportunities in STEM fields.

Having only been offline since mid-2022, the plant remains in workable condition – prior to which it achieved the U.S. Nuclear Regulatory Commission's (NRC) best safety category and high marks from within its industry. Throughout this process and going forward, we expect NRC to utilize its full independent oversight authorities to ensure the most stringent standards of safety.

Holtec has filed an application for federal loan funding through the U.S. Department of Energy earlier this year to repower Palisades. Many additional partners are standing ready to help take on this responsibility. Palisades' capabilities were recently recognized in the State's FY 2024 budget with a \$150 million investment for repowering. Stakeholders of all kinds have expressed support for Palisades, including local levels of government like Covert Township and several county boards, chambers of commerce and business groups like the Michigan Manufacturers Association, organized labor groups, and many local educational institutions. Importantly, in

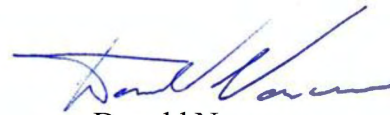
September 2023, Holtec secured a long-term power purchase agreement with Wolverine Power Cooperative, a not-for-profit rural power provider. Now, with these commitments from Holtec, the State of Michigan, and others, we urge the Department of Energy to give its fair, full, and swift consideration to the application. Buy-in from all parties will be necessary to make Palisades an operational success now and for future generations.

The repowering of Palisades represents a critical step in addressing energy shortages, supporting the fight to lower carbon emissions, and promoting economic growth. On behalf of the communities we represent, we thank you for your prompt attention to this important matter.

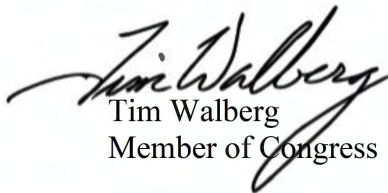
Sincerely,



Bill Huizenga
Member of Congress



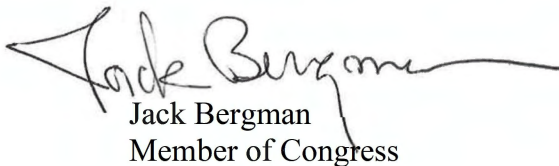
Donald Norcross
Member of Congress



Tim Walberg
Member of Congress



Haley M. Stevens
Member of Congress



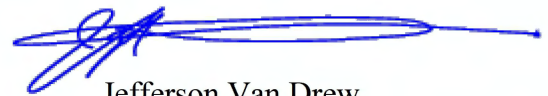
Jack Bergman
Member of Congress



Hillary J. Scholten
Member of Congress



John R. Moolenaar
Member of Congress



Jefferson Van Drew
Member of Congress



Elissa Slotkin
Member of Congress

Enclosure 3
HDI PNP 2024-037

Enclosure 3
HDI PNP 2024-037
Response to Request for Additional Information –
RAI-GEN-3
Regarding the Proposed Reauthorization of Power Operations of
Palisades Nuclear Plant Under
Renewed Facility Operating License No. DPR-20

NRC RAI Number: RAI-GEN-3

Provide a status for all necessary environmental permits, licenses, approvals, and other entitlements required for the proposed actions to resume and continue operations of the PNP (e.g., permits issued under the Clean Water Act, Clean Air Act, Coastal Zone Management Act, etc.). Include any permits required for any planned restart-related activities in support of the proposed Federal actions. Describe the status of compliance with these requirements and any consultations with state or local agencies.

The NRC staff is preparing an EA and will assess whether there have been any changes to operating permits or other requirements. Enclosure 2, *“Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant”*, table 1.3-1, did not provide a complete listing and status, e.g., the Low-Level Radioactive Waste permit expires August 2024, the Maintenance Dredging permit expires April 2025, the Scientific Collector’s Permit expired December 2023, and consistency with the Coastal Zone Management Act was not included.

This information is necessary for the NRC staff to assess the status of permits and the environmental impacts of the proposed Federal actions. In requesting this information, the NRC is guided by the following CEQ regulations:

- 40 CFR 1501.5, “Environmental assessments”: “(k) As appropriate to improve efficiency and effectiveness of environmental assessments, agencies may apply the other provisions of part 1502 and 1503 of this subchapter, including §§ ... 1502.24 ... to environmental assessments.”
- 40 CFR 1502.24 “Environmental review and consultation requirements”: “(b) The draft environmental impact statement shall list all Federal permits, licenses, and other authorizations that must be obtained in implementing the proposal. If it is uncertain whether a Federal permit, license, or other authorization is necessary, the draft environmental impact statement shall so indicate.”

HDI Response to RAI:

The status of PNP permits (Table 1.3-1 Environmental Authorizations for Current PNP Operations) is included in Attachment 1. The August 30, 2024, response from MI EGLE on the Coastal Zone Management Act Consistency Certification is included in Attachment 2.

References:

None.

Associated Attachments:

1. Table 1.3-1 Environmental Authorizations for Current PNP Operations
2. Letter, Matt Smar, EGLE to J. Britting, HDI, RE: Coastal Zone Management Act Consistency Certification for the Palisades Nuclear Power Plant’s Renewed Facility Operating License, Covert Township, Van Buren County, Michigan, August 30, 2024.

Enclosure 3
Attachment 1
HDI PNP 2024-037

HDI PNP 2024-037

Enclosure 3

**Attachment 1 - Table 1.3-1 Environmental Authorizations
for Current PNP Operations**

3 pages follow

Table 1.3-1 Environmental Authorizations for Current PNP Operations (Sheet 1 of 3)

| Agency | Authority | Requirement | Number | Expiration Date | Authorized Activity |
|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| NRC | Atomic Energy Act [10 CFR Part 50] | License to operate | DPR-20 | 3/24/2031 | Operation of PNP |
| State of Michigan | Clean Water Act Section 401 [33 USC 1341] | Certification of water quality standards | Not available | Not applicable, Michigan Department of Environmental, Great Lakes, and Energy (EGLE) contacted for certification or wavier applicable to resuming power operations | Discharge into waters of the U.S. under the Michigan NPDES permit ^(a) |
| State of Michigan | Coastal Zone Management Act | Federal Consistency Certification | Not available | March 24, 2031 | Operations are consistent with Michigan coastal zone policies |
| U.S. Department of Transportation | [49 USC 5180 (49 CFR Part 107, Subpart G)] | Registration | 051122600031EG | 6/30/2025 | Hazardous material shipments |
| Tennessee Department of Environment and Conservation (TDEC) | TDEC Rule 0400-20-10-.32 | License to ship radioactive material | T-MI-003-L24 | 12/31/2024 Renewed annually | Shipment of radioactive material to a licensed disposal/processing facility in Tennessee |
| EGLE | Federal Resource Conservation and Recovery Act [42 USC 6901] and Michigan Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451, as amended | Hazardous waste generator license | MID098644685 | Not applicable | Authorizes facility to operate as a hazardous waste generator |

Table 1.3-1 Environmental Authorizations for Current PNP Operations (Sheet 2 of 3)

| Agency | Authority | Requirement | Number | Expiration Date | Authorized Activity |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EGLE | Federal Clean Water Act, Section 402 (33 USC 1251 et seq.), Michigan Act 451, Public Acts of 1994 (as amended), parts 31 and 41; Michigan Executive Orders 1991-31, 1995-4, and 199518 | National Pollutant Discharge Elimination System (NPDES) permit | MI0001457 | DRAFT renewal issued in Fall 2024. Update: Final permit pending | Discharges of stormwater, wastewater, and treated water to waters of the State |
| EGLE | R 323.1050 of the Part 4 Rules promulgated pursuant to Part 31 of the NREPA | Storm Water Management Industrial Site Certification | I-18257 | 7/1/2026 | Required to ensure proper management of the industrial sites storm water run-off and the storm water inspection program |
| EGLE | Air Pollution Control of the NREPA, 1994 PA 451 Section 5506(3) of Part 55, and Michigan Air Pollution Control Rule 210(1) and Clean Air Act (CAA) | Renewable operating permit (air quality) | MI-ROP-B2934-2019a | 2/4/2024 Renewal submitted and confirmation received 8/15/2023. Application deemed complete. The existing renewable operating permit shall not expire until the renewal permit is issued. | Operate air emission sources (evaporator heating boiler, plant heating boiler, office heating boiler, emergency generators, emergency diesel engine auxiliary feedwater system, emergency fire pumps, emergency air compressor, and cold cleaners) |
| EGLE | Part 31 of Michigan Act 451 (as amended) | Waste treatment plant operator certification | W 7992 W 8468 W 8469 W 8470 W 8471 | 7/1/2025 7/1/2028 7/1/2028 7/1/2028 7/1/2028 | Operate industrial or commercial waste treatment facility |

Table 1.3-1 Environmental Authorizations for Current PNP Operations (Sheet 3 of 3)

| Agency | Authority | Requirement | Number | Expiration Date | Authorized Activity |
|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| EGLE | NREPA 1994 PA 451, as amended; Part 325, Great Lakes Submerged Lands; and Part 353, Sand Dunes Protection and Management | Dredging permit | WRP020704 v1.0 | 4/16/2025 | Maintenance dredging of sand along security fences, other security infrastructure, and stormwater outfall structures |
| Texas Low-Level Radioactive Waste Disposal Compact Commission | Texas Admin. Code Title 31, Natural Resources and Conservation, Part 21 | Agreement | TLLRWDC #2-0453-00 / #2-0454-00 | 8/31/2025 Renewed annually | Agreement for the importation of nonparty low-level radioactive waste |
| Bureau of Fire Service | Michigan Fire Prevention Code, 1941 PA 207 | Aboveground tank registration | Facility ID: 91084220 | Registration and yearly fee ASTs currently listed as registered within online EGLE system | Registration of three diesel ASTs |
| Michigan Department of Natural Resources-Fisheries Division | NREPA 1994 PA 451, Part 487, as amended, Section 324.48735 | Scientific collector's permit | 2024 Permit No. FSCP0107202213 0824 | Expiration: 12/31/2024 Renews annually | Survey, handle, take, catch, kill, and/or possess fish species not listed in Michigan as special concern, threatened, or endangered |

a. As stated in the final addendum to the PNP final environment statement (ML19308B287), "The Palisades Nuclear Generating Plant has received an NPDES permit from the State of Michigan Department of Natural Resources. This permit fulfills the requirements for water quality certification as provided in Section 401 of the Federal Water Pollution Control Act Amendments of 1972."

Enclosure 3
Attachment 2
HDI PNP 2024-037

HDI PNP 2024-037

Enclosure 3

**Attachment 2 - Letter, Matt Smar, EGLE to J. Britting, HDI,
RE: Coastal Zone Management Act Consistency Certification
for the Palisades Nuclear Power Plant's Renewed Facility Operating License**

3 pages follow



GRETCHEN WHITMER
GOVERNOR

HDI PNP 2024-037
STATE OF MICHIGAN
DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY
LANSING



PHILLIP D. ROOS
DIRECTOR

August 30, 2024

VIA EMAIL

Johann Britting, Regulatory Assurance Compliance Specialist
Holtec Decommissioning International, LLC
27780 Blue Star Highway
Covert, Michigan 49043
j.britting@holtec.com

Dear Johann Britting:

Subject: Coastal Zone Management Act Consistency Certification for the Palisades Nuclear Power Plant's Renewed Facility Operating License, Covert Township, Van Buren County, Michigan

The Michigan Department of Environment, Great Lakes, and Energy (EGLE), Water Resources Division, has reviewed the e-mail submitted by Holtec Decommissioning International, LLC, on August 6, 2024, asking EGLE to affirm that the Coastal Zone Management Act Consistency Certification (Certification) issued on June 14, 2005, for renewal of the Palisades Nuclear Power Plant's (NPP) Facility Operating License remains valid through expiration of the license on March 24, 2031. This letter describes the conditions to be met for the 2005 Certification to remain valid and provides current information on the requirements included in the 2005 Certification.

Certification Term

Certification of federal license or permit activity under Section 307 of the Coastal Zone Management Act, PL 92-583, as amended, is addressed in 15 CFR 930, Subpart D, "Consistency for Activities Requiring a Federal License or Permit." The term "Federal license or permit" is defined at 15 CFR 930.51 and includes certain types of renewals and major amendments of licenses or permits. In reviewing an application for a license or permit amendment, the federal agency determines whether the federal license or permit requires a major amendment with input from the state and applicant. Per 15 CFR 930.51(b)(3), the determination hinges on whether the activity authorized by the amended license or permit would "affect any coastal use or resource in a way that is substantially different than the description or understanding of effects at the time of the original activity."

A proposed major amendment of a federal license or permit requires Certification. Consequently, the term of the 2005 Certification continues through the expiration of the Palisades NPP's Renewed Facility Operating License unless the Nuclear Regulatory Commission (NRC) determines that the license requires a major amendment as defined

Johann Britting, Holtec Decommissioning International, LLC

Page 2

August 30, 2024

in 15 CFR 930.51, and a request for Certification is submitted to and granted by EGLE prior to the date of license expiration. Factors to consider in making such a determination include, for example, whether the proposed activity would result in substantially increased discharges of wastes to the air or surface waters, and whether the proposed activity would require substantial development or redevelopment of the facility grounds.

Certification Conditions

The 2005 Certification contains the following paragraph:

“Provided all required [Department of Environmental Quality] permits are issued and complied with, no adverse impacts to coastal resources are anticipated from this phase of the project as described in the information you forwarded to our office. Issuance of all required permits will certify the activity for which the permits were issued as consistent with the MCMP [Michigan Coastal Management Program]. Additionally, all conditions in the NRC license must be adhered to. If no permits are required, the license renewal shall be deemed consistent with MCMP effective as of the date of this letter.”

State statutes that establish permit requirements or other requirements for operation, maintenance, or other activities that may impact coastal resources or uses at the Palisades NPP and associated utility rights-of-way include, but may not be limited to, the following:

- Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). Permit requirements applicable to the Palisades NPP's wastewater and stormwater discharges are established in section 3112.
- Part 55, Air Pollution Control, of NREPA. Title V Renewable Operating Permit (ROP) requirements applicable to the Palisades NPP's emissions are established in section 5506.
- Part 91, Soil Erosion and Sedimentation Control, of NREPA. Permit requirements for earth change activities are established in section 9112.
- Part 301, Inland Lakes and Streams, of NREPA. Permit requirements for activities in inland lakes and streams are established in section 30102 and exceptions are listed in section 30103.
- Part 303, Wetlands Protection, of NREPA. Permit requirements for activities in wetlands are established in section 30304 and exceptions are listed in section 30305.
- Part 325, Great Lakes Submerged Lands, of NREPA. Permit requirements for activities in the Great Lakes and Lake St. Clair are established in section 32512.
- Part 353, Sand Dunes Protection and Management, of NREPA. Permit requirements for activities in designated Critical Dune Areas are established in section 35304 and utility exemptions are listed in section 35306.

Johann Britting, Holtec Decommissioning International, LLC

Page 3

August 30, 2024

- Part 365, Endangered Species Protection, of NREPA. Pursuant to section 36505, take of an endangered or threatened species is prohibited unless authorized under permit. “Take” of a listed animal species is defined at subsection 36501(f), and “take” of a listed plant species is defined at subsection 36501(g). Lists of endangered and threatened species are in administrative rules R 299.1201 et seq of the Michigan Administrative Code. Multiple state-listed endangered and threatened species may occur at Palisades NPP and associated utility rights-of-way. State-listed species that have been recorded at the facility include the endangered Prairie vole (*Microtus ochrogaster*) and threatened Eastern box turtle (*Terrapene carolina*) and Pitcher’s thistle (*Cirsium pitcheri*).

These statutes and associated administrative rules contain many of the approved enforceable policies of the MCMP that are applied in the review of Certification requests.

The 2005 Certification does not waive the need for permits that may be required under other federal, state, or local statutes. If you have questions regarding this letter, please contact me at 517-230-7849 or SmarM@Michigan.gov.

Sincerely,



Matt Smar, Environmental Quality Specialist
Field Operations Support Section
Water Resources Division

cc: Amy Lounds, EGLE
Christine Alexander, EGLE
Monica Brothers, EGLE
Mariah Scott, EGLE
Amy Bleisch, DNR

Enclosure 4
HDI PNP 2024-037

Enclosure 4
HDI PNP 2024-037
Response to Request for Additional Information –
RAI-GEN-4
Regarding the Proposed Reauthorization of Power Operations of
Palisades Nuclear Plant Under
Renewed Facility Operating License No. DPR-20

NRC RAI Number: RAI-GEN-4

Provide a detailed list of past, present, and reasonably foreseeable future projects that would affect the same resources affected by the proposed Federal actions, e.g., subsequent license renewal; HOLTEC SMR; or any refurbishment or replacement activities that would impact environmental resources.

CEQ defines cumulative impacts (also known as cumulative effects) in 40 CFR 1508.1(i) as “effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative effects can result from actions with individually minor but collectively significant effects taking place over a period of time.” The goal of the analysis is to introduce environmental considerations into the planning process as early as needed to improve decision-making. While Section 4.12 of Enclosure 2, *“Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant”*, provided a brief description of building activities, there was not a detailed list of past, present, and reasonably foreseeable projects or enough information to make a determination, e.g., are structures such as the day care center to be constructed in an already disturbed area.

HDI Response to RAI:

Holtec is not aware of new offsite future projects planned for the surrounding area. Holtec is studying the Palisades property for potential future development of small modular reactor units. If NRC authorizes resumption of power operations for PNP Unit 1, Holtec also plans to pursue a subsequent license renewal for PNP Unit 1 and currently is assuming no refurbishment activities for the subsequent license renewal.

References:

None.

Associated Attachments:

None.

Enclosure 5
HDI PNP 2024-037

Enclosure 5
HDI PNP 2024-037
Response to Request for Additional Information –
RAI-ALT-1
Regarding the Proposed Reauthorization of Power Operations of
Palisades Nuclear Plant Under
Renewed Facility Operating License No. DPR-20

NRC RAI Number: RAI-ALT-1

HDI has included the no-action alternative in Enclosure 2, “Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant”:

The no-action alternative is that PNP would not receive authorization to resume power operations, and the plant would continue decommissioning in accordance with NRC regulations. PNP’s Post Shutdown Decommissioning Activities Report (PSDAR) provides the environmental impact assessment for this no-action alternative (HDI 2020).

However, an analysis of other alternative categories was not provided. Provide an analysis of the following alternative categories, as they relate to HDI’s purpose and need statement; if HDI believes alternatives in these categories should be dismissed from further consideration, please provide the bases:

- Energy Alternatives
- System Alternatives

HDI Response to RAI:

The proposed action is NRC’s granting of Holtec’s exemption request which would provide an option for clean energy baseload power generation from restart through March 24, 2031. For planning purposes, the projected restart date would be October 2025. Given the October 2025 availability date, development of new generation sources is not feasible. In the absence of new generation, power needs could be offset by instituting energy conservation and efficiency measures (demand side management), delaying the scheduled retirement of one or more existing power plants, or purchasing an equivalent amount of power from other energy suppliers.

NRC examined the potential for conservation and energy efficiency programs to provide power replacement. NRC indicated that, while the energy conservation or energy efficiency potential in the United States is substantial, the NRC staff is not aware of any cases where demand side management programs has been implemented expressly to replace or offset a large, baseload generation station.

Other than resumption of operations at PNP, the alternative of delayed retirement or resumption of operations would likely involve a fossil-fuel plant such a coal plant slated for closure. Reactivating or continuing to operate fossil fuel-fired plants would result in much higher criteria air pollutant emissions and greenhouse gases than the operation of a nuclear power plant. Continuing to operate fossil fuel-fired generation sources is counter to Michigan’s Clean and Renewable Energy and Energy Waste Reduction Act of 2023 which set a clean energy supply goal of 80 percent by 2035.

Purchased power agreements would need to supply PNP’s net generating capability, which is given as approximately 786 MWe in the 2005 license renewal environmental report. As indicated in the 2024 License Renewal Generic Impact Statement (GEIS) (ML23201A224), coal,

natural gas, and nuclear-fueled power plants have historically been the most prevalent sources of baseload purchased power, though an increasing number of renewable energy sources are emerging as viable options. As such, the effects of deploying offsetting alternatives such as purchased power are likely to be similar to the effects of operating a combination of alternative electrical energy-generating technologies. NRC examined the environmental impacts of operating these energy sources in the license renewal GEIS.

Beyond environmental impacts, purchased power is subject to availability with supply being challenged by retirement of fossil fuel plants and increasing power demand. Purchased power agreements carry the inherent risk that the supplier may not be able to deliver all the contracted power. The need for replacement of baseload power at PNP's generation capacity further increases this risk. In addition, new transmission capacity may be required to distribute electricity from existing generation sources. The October 2025 required timeline for availability also challenges the ability to develop additional transmission capacity. Therefore, purchased power is not considered a reasonable alternative to resumption of power operations at PNP.

The 2006 Supplemental Environmental Impact Statement (SEIS) determined that PNP operations do not have significant environmental impacts. The *Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant*, of the 10 CFR 50.82 Exemption Request (ML23271A140), concluded that there is no new and significant information that would alter the conclusions of the 2006 SEIS. System alternative analysis generally focuses on cooling options. PNP operations would continue the use of cooling towers, which have been determined to be the best technology available for minimizing impingement and entrainment impacts. Therefore, system alternatives for resuming operations at PNP are not warranted.

References:

None.

Associated Attachments:

None.

Enclosure 6
HDI PNP 2024-037

Enclosure 6

HDI PNP 2024-037

Response to Request for Additional Information –

RAI-SW-4

**Regarding the Proposed Reauthorization of Power Operations of
Palisades Nuclear Plant Under
Renewed Facility Operating License No. DPR-20**

NRC RAI Number: RAI-SW-4

Provide the location, on an appropriate map, where any dredged materials are permitted to be placed during planned restart-related activities and operations should dredging be necessary. Enclosure 2, "*Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant*," Section 4.2.2.6 mentions both unvegetated and vegetated beach areas and the lake where dredged materials were placed.

Surface water quality can be adversely affected by dredging activities performed to maintain the performance of nuclear power plant water intakes and discharges.

HDI Response to RAI:

No dredging is anticipated at PNP due to restart-related activities. EGLE Permit No. WRP020704, issued April 16, 2020, and expiring April 16, 2025, allows placement of dredged materials related to maintaining storm water outfalls and security fencing to be spread on the unvegetated beach. There is no specific designated location for placement of dredged materials, should dredging become necessary during operations. Holtec also plans to review the level of sediment deposition within the mixing basin and, if needed, undertake sediment removal. The sediment removal, if to be undertaken, would be conducted after the appropriate permits are obtained. Spoils would be tested for radioactivity and other contaminants as needed prior to disposal offsite. A storm water map and mixing basin figure is provided in Attachment 1.

References:

None.

Associated Attachments:

1. Storm Water System Map

Enclosure 6
Attachment 1
HDI PNP 2024-037

HDI PNP 2024-037

Enclosure 6

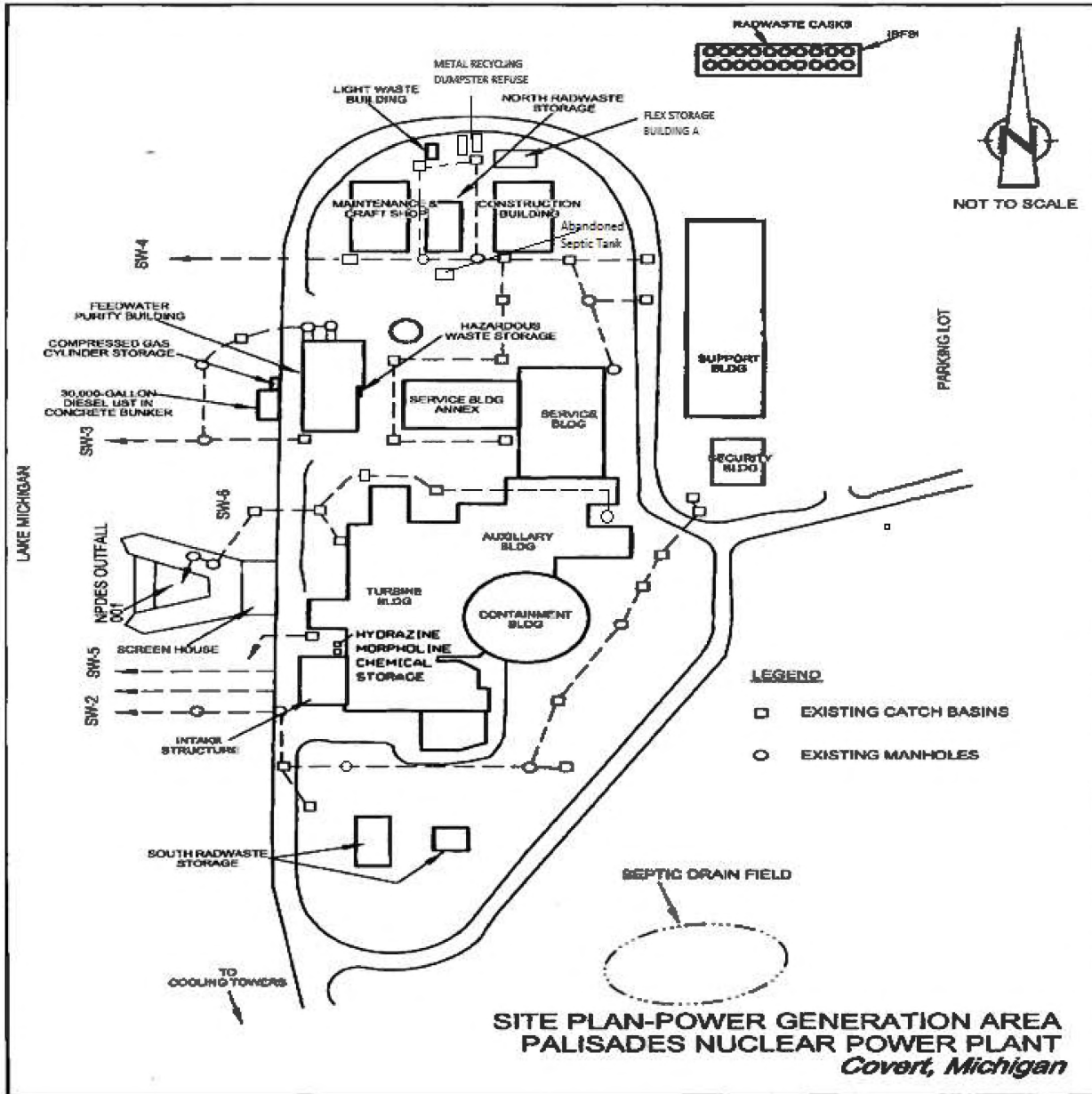
Attachment 1 – Storm Water System Map

1 page follows

Spill Prevention Control & Countermeasures (SPCC) Plan
Entergy Nuclear – Palisades, LLC

Figure 5
Revision 30
Page 1 of 1

STORM WATER SYSTEM MAP



Enclosure 7
HDI PNP 2024-037
Response to Request for Additional Information –
RAI-SW-11
Regarding the Proposed Reauthorization of Power Operations of
Palisades Nuclear Plant Under
Renewed Facility Operating License No. DPR-20

Water Resources - Surface Water (SW)

NRC RAI Number: RAI-SW-11

Holtec is planning to replace both component cooling water (CCW) heat exchangers before restarting Palisades. Provide the following information related to the CCW heat exchangers:

- A description of the CCW system heat exchangers and all its interfaces with the surface water environment.
- Changes in the maximum and typical heat loads compared to the old CCW heat exchangers.
- Changes in the flow rate and consumptive use compared to the old CCW heat exchangers.

HDI Response to RAI:

Holtec is planning to replace both component cooling water (CCW) heat exchangers before restarting PNP. The following information is related to the CCW heat exchangers (CCWHX):

- A description of the CCWHX and all its interfaces with the surface water environment.

The existing CCWHX are two, nominally 50% capacity shell and tube horizontal single-pass heat exchangers. They are designed to cool the CCW (shell side) using Service Water (tube side). The CCW System is a closed loop secondary cooling system that is a monitored (for radioactivity) intermediate cooling system between radioactively contaminated systems requiring cooling and the tertiary cooling system, Service Water (SW). The SW System is the open loop system that serves as the ultimate heat sink for PNP and draws water from Lake Michigan and returns water to the Circulating Water System at the Makeup Basin (the source of water to the cooling towers (when in service) or discharge to Lake Michigan via the Mixing Basin (the interface with the surface water environment). The SW System is also monitored for potential radioactivity.

During normal plant operation, both heat exchangers are required to be in service due to equipment limitations associated with flow rates on the shell (CCW) side. The normal heat load is relatively low compared to their maximum capacity. Maximum heat load is associated with the first several days after plant shutdown as plant cooldown operations are occurring.

The proposed replacement CCWHXs will be two 100 percent capacity shell and tube horizontal single-pass heat exchangers. The installation of 100 percent capacity heat exchangers will allow the operational flexibility to remove one of them from service by isolating both the CCW (shell side) and SW (tube side) and allowing maintenance on one heat exchanger at a time. There is no change anticipated to the SW side and thus no change to the interface with the surface water environment.

- Changes in the maximum and typical heat loads compared to the old CCW heat exchangers.

As there is no change to heat loads cooled by the CCWHXs, there will be no change to the maximum or typical heat loads because of replacing the heat exchangers.

- Changes in the flow rate and consumptive use compared to the old CCW heat exchangers.

There is no anticipated change in CCW or SW flow rates because of replacing the heat exchangers. What may change is whether SW flow is through both heat exchangers or only one at a time, but the total SW flow will not change (in order to preclude reducing flow to other SW cooled loads). There currently is not, nor will there be any, “consumptive” use – all CCW and SW water is returned to their respective system. The amount of SW that is consumed (by evaporation at the cooling towers) will be unchanged by replacement of the CCWHXs.

References:

None.

Associated Attachments:

None.

Enclosure 8
HDI PNP 2024-037

Enclosure 8

HDI PNP 2024-037

Response to Request for Additional Information –

RAI-GW-2

**Regarding the Proposed Reauthorization of Power Operations of
Palisades Nuclear Plant Under
Renewed Facility Operating License No. DPR-20**

NRC RAI Number: RAI-GW-2

Provide an updated geologic cross-section of the site that includes current building foundations and site infrastructure elevations.

An updated geologic cross-section depicting pertinent water-bearing units that can transport potential releases of radioactive and nonradioactive material offsite was not provided. The NRC staff assesses the modified environment around the plant to determine the potential for offsite transportation of contaminants.

HDI Response to RAI:

Geologic cross sections from a hydrogeologic investigation report, which were updated in 2023, are provided in Attachment 1.

References:

None.

Associated Attachments:

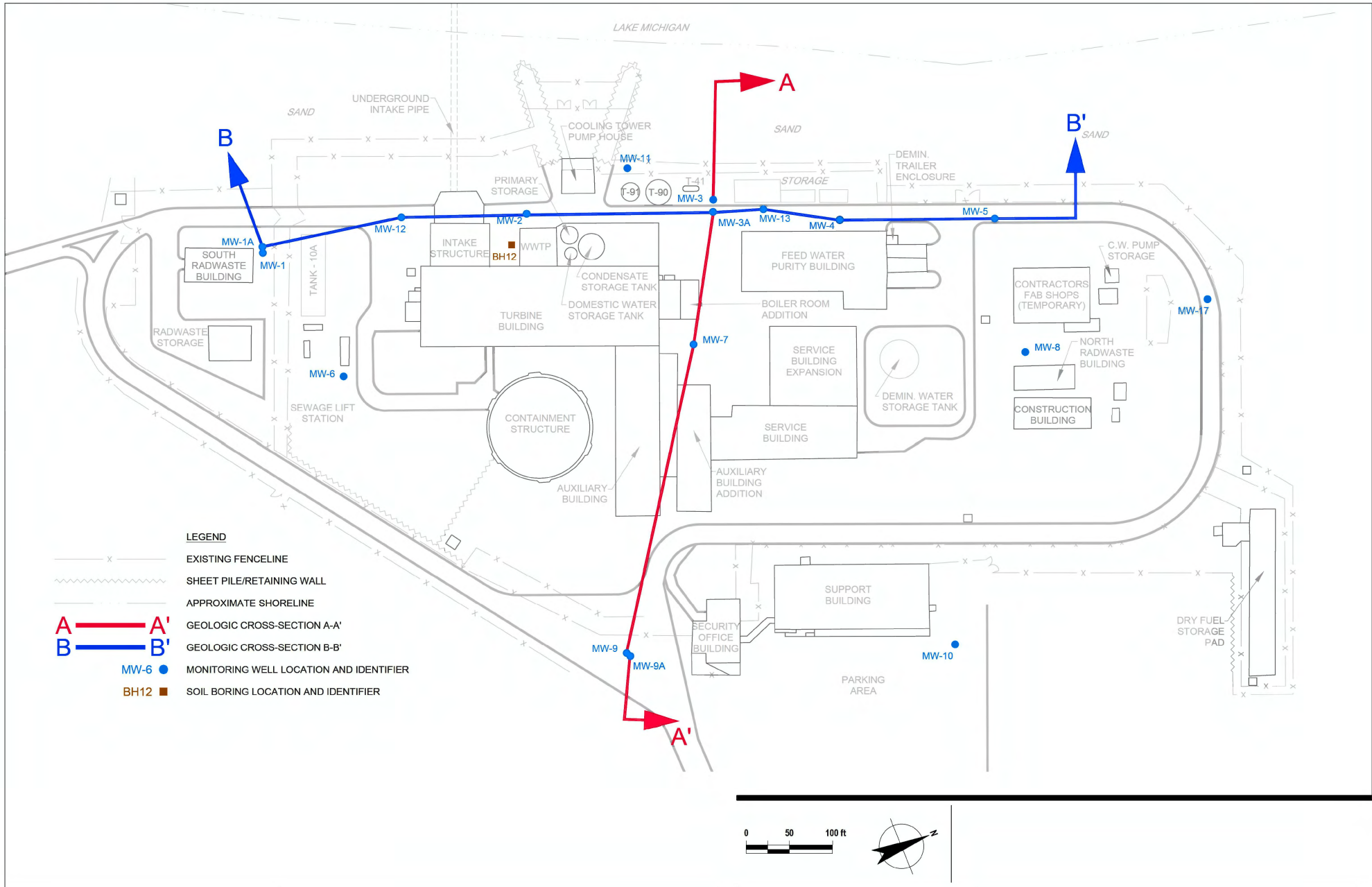
1. Geologic Cross Sections

Enclosure 8
Attachment 1
HDI PNP 2024-037

HDI PNP 2024-037

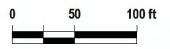
Enclosure 8
Attachment 1 - Geologic Cross Sections

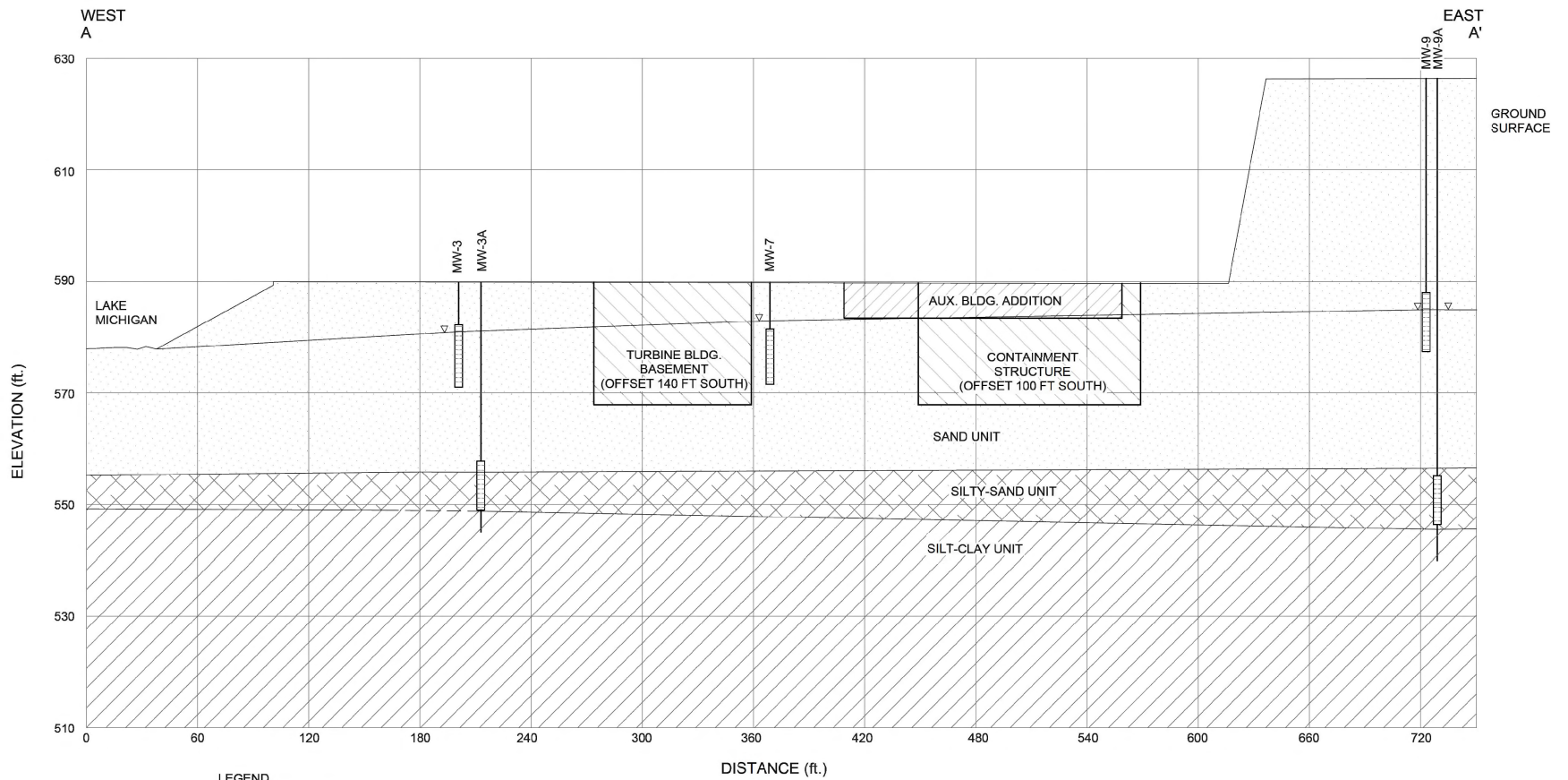
3 pages follow



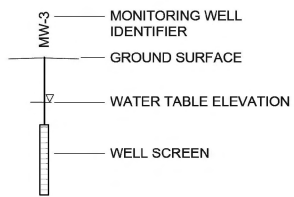
LEGEND

- EXISTING FENCELINE
- SHEET PILE/RETAINING WALL
- APPROXIMATE SHORELINE
- GEOLOGIC CROSS-SECTION A-A'
- GEOLOGIC CROSS-SECTION B-B'
- MW-6 ● MONITORING WELL LOCATION AND IDENTIFIER
- BH12 ■ SOIL BORING LOCATION AND IDENTIFIER

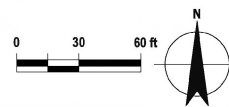


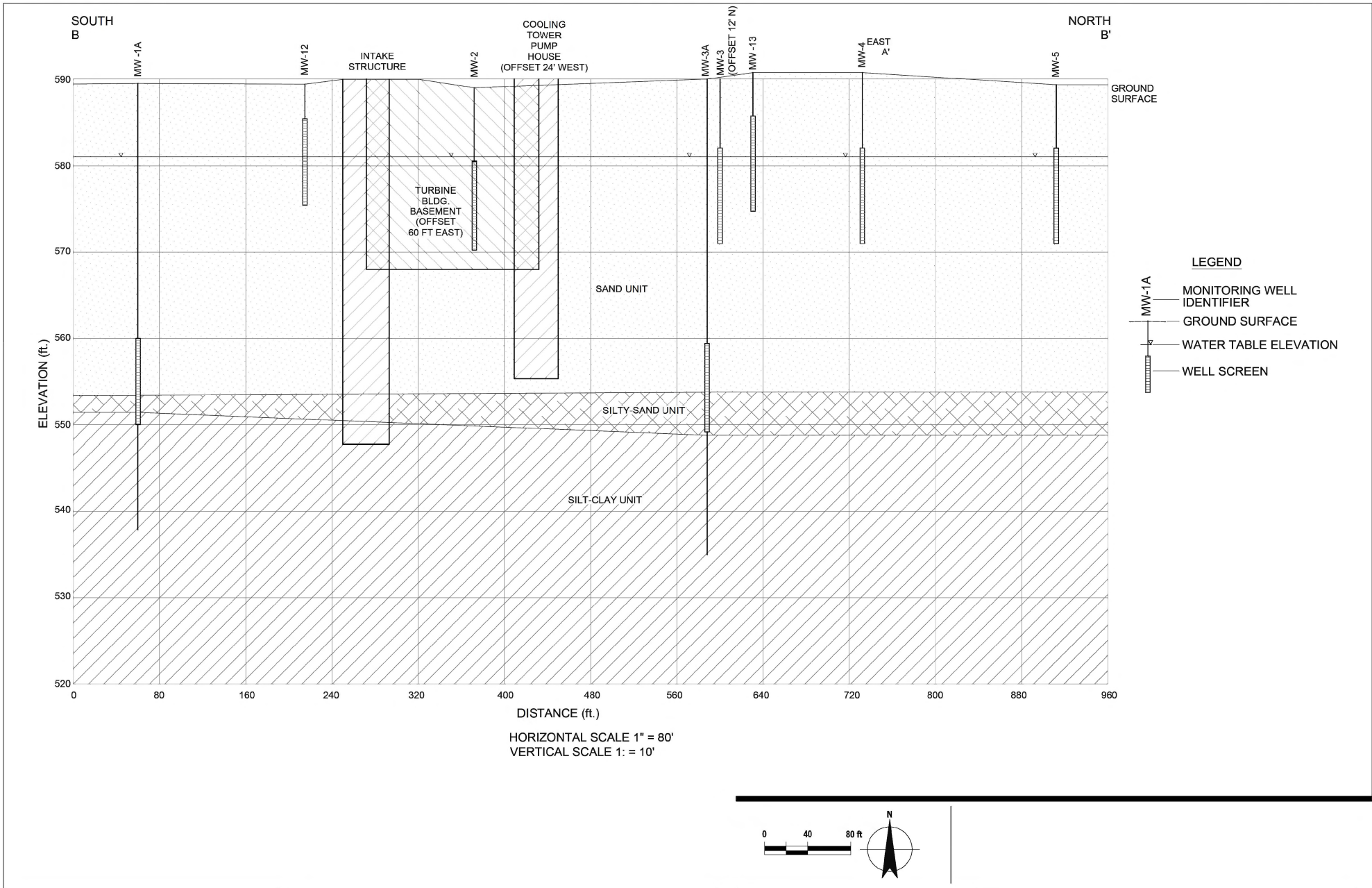


LEGEND



HORIZONTAL SCALE 1" = 60'
VERTICAL SCALE 1" = 20'





Enclosure 9
HDI PNP 2024-037

Enclosure 9
HDI PNP 2024-037
Response to Request for Additional Information –
RAI-GW-3
Regarding the Proposed Reauthorization of Power Operations of
Palisades Nuclear Plant Under
Renewed Facility Operating License No. DPR-20

NRC RAI Number: RAI-GW-3

Figure 3.2-1 of Enclosure 2, "*Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant,*" of HDI's exemption request depicts groundwater contours. Provide the year and month that the elevation data were collected that were used to generate the contours. Provide recent contour maps or groundwater elevation data that capture seasonal variation (if any) of site groundwater levels.

The present-day hydraulic characterization of the site is needed to inform baseline conditions that may be impacted by the proposed actions. Recent groundwater elevation data and seasonal variability inform groundwater flow patterns at the site that may impact offsite groundwater users and groundwater quality.

HDI Response to RAI:

As presented in Section 3.2.1.2 on page 24 of the "*Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant,*" of the 10 CFR 50.82 Exemption Request (ML23271A140), water level elevation data presented in Figure 3.2-1 were collected in June 2017. The most recent available potentiometric surface map is provided in Attachment 1.

References:

None.

Associated Attachments:

1. Groundwater Contours – April 25, 2023

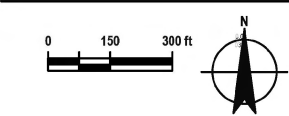
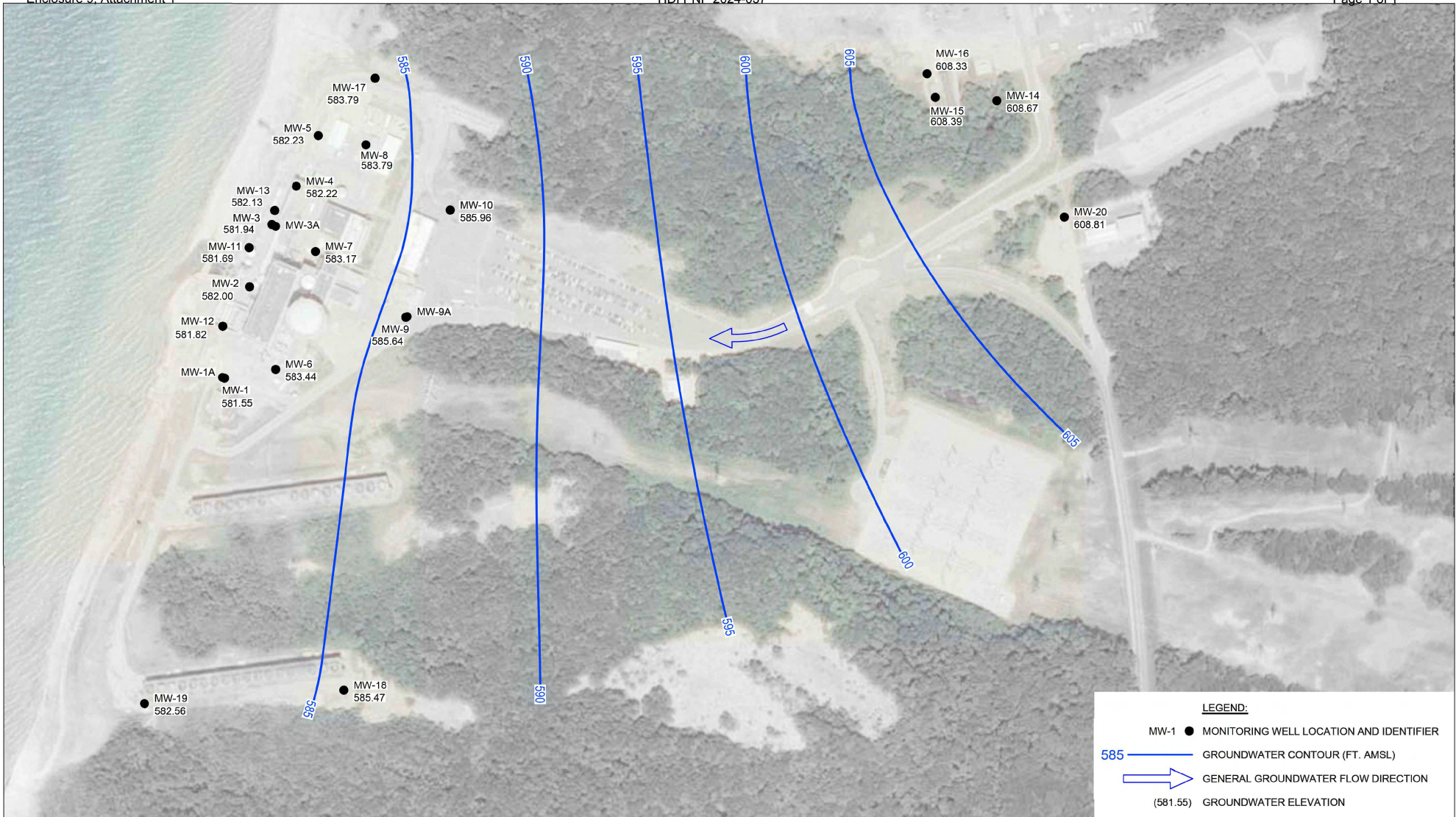
Enclosure 9
Attachment 1
HDI PNP 2024-037

HDI PNP 2024-037

Enclosure 9

Attachment 1 - Groundwater Contours – April 25, 2023

1 page follows



PALISADES NUCLEAR POWER PLANT
27780 BLUE STAR HWY
COVERT, MICHIGAN

GROUNDWATER CONTOURS -
APRIL 25, 2023

Enclosure 10
HDI PNP 2024-037

Enclosure 10

HDI PNP 2024-037

Response to Request for Additional Information –

RAI-GW-5

**Regarding the Proposed Reauthorization of Power Operations of
Palisades Nuclear Plant Under
Renewed Facility Operating License No. DPR-20**

NRC RAI Number: RAI-GW-5

Section 3.2.1.2 of Enclosure 2, "*Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant*", of HDI's exemption request states HDI's plans to undertake remediation and repairs as part of the resumption of power operations efforts in response to inadvertent releases of tritium to groundwater. Describe updates (if any) to these plans beyond what is described in the exemption request, including any potential ground disturbance.

HDI Response to RAI:

The planned repairs and re-routing prior to resumption of power operations are included on the listing of restart activities presented in Enclosure 1. The history of repairs to the underground piping and aboveground tank system since 2008 is as follows:

- In October 2008, the liner for Tank T-91 was replaced to address a coating failure that allowed leakage into the pit for Tanks T-90 and T-91.
- In January 2010, buried recirculation piping leading to Tank T-91 was replaced with new stainless-steel piping between the auxiliary building wall and the valve pit wall. In November 2012, the oily waste discharge pipe was lined. The original radwaste discharge line to the mixing basin via dilution water piping was abandoned and re-routed to the newly lined parallel oily waste discharge pipe.
- In August 2013, the combined overflow line from Tanks T-90, T-91, and T-41 (turbine building drain tank) was lined. This line goes under the auxiliary building. In October 2015, the underground piping from the M-18 oil/water separator to Tank T-41 was replaced.
- In June 2017, the piping for Tank T-91 adjacent to the valve pit was lined, and Tank T-91 was recoated to repair degraded lower wall and floor coating.
- In October 2020, a permanent heat-traced hose was replaced from Tank T-41 to the mixing basin.
- As described in Section 3.2.1.2 of Enclosure 2, "*Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant*," of the 10 CFR 50.82 Exemption Request (ML23271A140), in 2022, Tanks T-87 and T-91 and associated underground piping were flushed with domestic water, and Tank T-91 was removed from recirculation after it was flushed and drained.

References:

None.

Associated Attachments:

None.

Enclosure 11
HDI PNP 2024-037

Enclosure 11

HDI PNP 2024-037

Response to Request for Additional Information –

RAI-MET-1

**Regarding the Proposed Reauthorization of Power Operations of
Palisades Nuclear Plant Under
Renewed Facility Operating License No. DPR-20**

NRC RAI Number: RAI-MET-1

Provide recent climatological data, synoptic meteorology and extreme weather events. A climate summary has been provided in the License Renewal Environmental Impact Statement (EIS) Supplement based on 2005 data. More recent data should be analyzed and provided and was not included in the Enclosure 2, "*Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant*" submittal.

HDI Response to RAI:

The climate summary provided in the 2006 SEIS was based on between 30- and 50-years of historical data. More recent data is not expected to vary significantly from the historical data and therefore was not evaluated. No significant changes to synoptic meteorology or extreme weather events from the historical record has been observed. The 2023 annual summary of Palisades meteorological tower data with trending analysis is provided in Attachment 1.

References:

None.

Associated Attachments:

1. Palisades Meteorological Monitoring Semiannual Data Report July 1, 2023 - December 31, 2023, and 2023 Annual Summary.

Enclosure 11
HDI PNP 2024-037

HDI PNP 2024-037

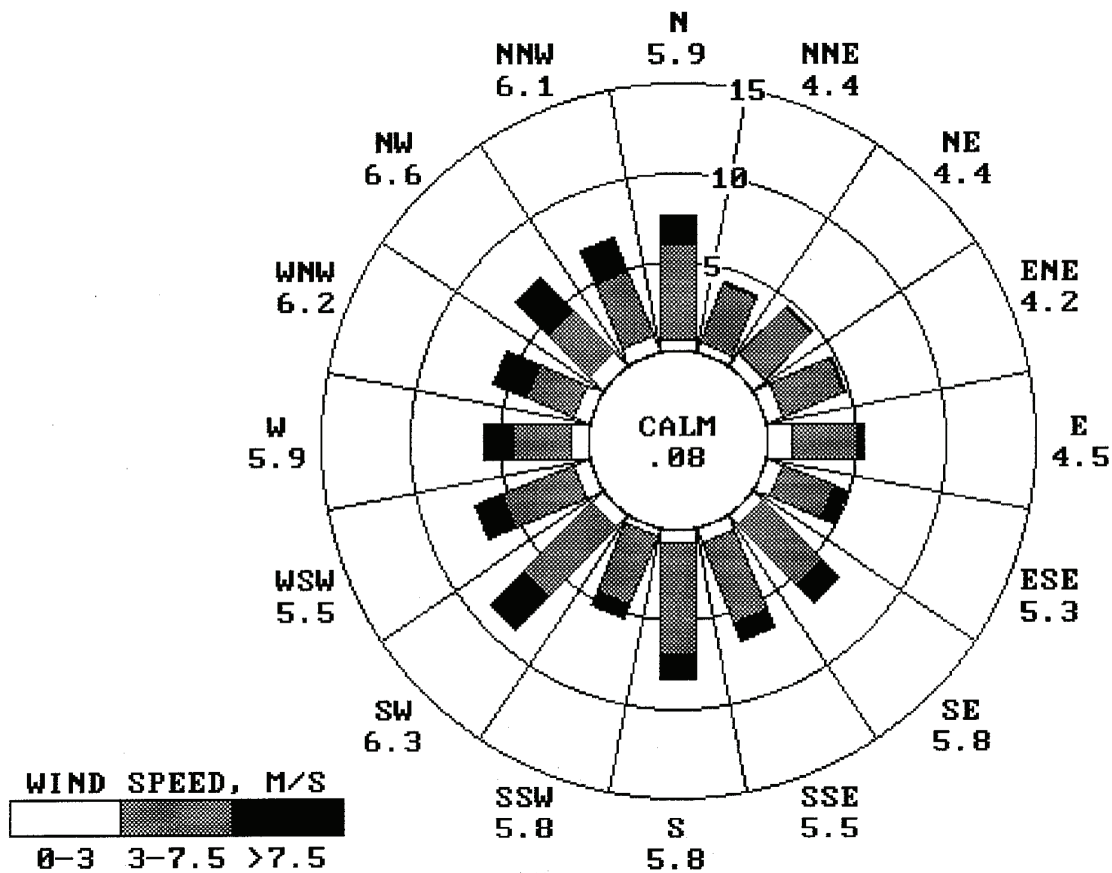
Enclosure 11

**Attachment 1 - Palisades Meteorological Monitoring
Semiannual Data Report
July 1, 2023 - December 31, 2023
and 2023 Annual Summary**

25 pages follow

Palisades Meteorological Monitoring Semiannual Data Report July 1, 2023 - December 31, 2023 and 2023 Annual Summary

**WIND FREQUENCY DISTRIBUTION
 PALISADES - 60 METER
 JANUARY 2023 - DECEMBER 2023**



LENGTH OF BAR SHOWS FREQUENCY IN PERCENT
 MEAN WIND SPEED SHOWN FOR EACH SECTOR

Holtec International, Inc.

PALISADES METEOROLOGICAL MONITORING
SEMIANNUAL DATA REPORT

JULY 1, 2023 - DECEMBER 31, 2023

AND

ANNUAL SUMMARY

JANUARY 1, 2023 - DECEMBER 31, 2023

Dennis F. Kahlbaum, Meteorologist, Kahlbaum & Associates, Inc., for Holtec International, Inc., 24 January 2023.

TABLE OF CONTENTS

| <u>SECTION</u> | <u>PAGE</u> |
|---------------------------------|-------------|
| 1.0 <u>INTRODUCTION</u> | 4 |
| 2.0 <u>PROJECT DISCUSSION</u> | 5 |
| 2.1 JULY - DECEMBER 2023 | 5 |
| 2.2 SUMMER 2023 | 11 |
| 2.3 AUTUMN 2023 | 14 |
| 2.4 ANNUAL 2023 | 17 |
| 3.0 <u>SUMMARY</u> | 25 |
| <u>APPENDICES</u> | |
| A. <u>JULY - DECEMBER 2023</u> | 26 |
| B. <u>SUMMER 2023 SUMMARY</u> | 121 |
| C. <u>AUTUMN 2023 SUMMARY</u> | 152 |
| D. <u>ANNUAL SUMMARY - 2023</u> | 183 |

1.0 INTRODUCTION

Holtec International, Inc. (Holtec) monitors meteorological data on a 60-meter tower at the Palisades Plant near South Haven, Michigan. Palisades Emergency Planning requires that the following parameters be measured: wind speed, wind direction and standard deviation of wind direction (σ theta) at the 10 and 60-meter levels on the meteorological tower, temperature at the 10-meter level, and temperature difference (ΔT) between the 10 and 60-meter levels. Dew point, which is not required, but was also measured at the 10-meter level through 1985, is no longer measured.

The sensor outputs are sampled and resolved into 15-minute averages by a digital data acquisition system (DDAS) located at the tower site. Independent recording devices are used as a back-up data recording system. Local and remote real-time data display capability aid in identifying instrument malfunctions. The site is checked in person periodically, remote indications are verified daily, and the instrument response (calibration) of each sensor is checked at least semiannually.

Parameter accuracies meet all applicable Nuclear Regulatory Commission (NRC) and Holtec standards. Minimum data recovery rates of 90% for each required parameter and 90% for the joint control room display of at least one wind speed, one wind direction and one stability parameter, have been established. Details on all aspects of the monitoring program, including data accuracy and recovery rates, and system configuration, operations, maintenance and calibrations, are given in the Holtec Procedure EM-33: Meteorological Monitoring System.

The 15-minute averages are acquired from the DDAS by remote computer and processed to hourly averages. The hourly data are checked against objective data quality criteria and given a final review by the Holtec contracted meteorologist before being published in this report and archived onsite. Details of the data processing and review steps are given in the Holtec Air Quality and Meteorology Data Processing Project Plan.

2.0 PROJECT DISCUSSION

2.1 JULY - DECEMBER 2023

Hourly Data and Monthly Summaries - Hourly data for the period 0100 EST July 1, 2023 through 2400 EST December 31, 2023 are given in Appendix A. In those tables, 99997-type codes represent calibration or maintenance activities, and 99999-type codes represent missing data. Monthly summaries of the maximum, minimum and mean values for temperature, delta-T, wind speed and sigma theta for July through December are given in Tables 2.1A - 2.1F respectively. Also included in these tables is the monthly data recovery rate for each parameter.

Examination of these tables shows that the maximum hourly wind speed at the 10-meter level during the period was 9.31 m/s (20.83 mph), which occurred at 0700 EST on November 8. The maximum speed at the 60-meter level was 17.75 m/s (39.71 mph), which occurred at 1000 EST on December 18. Temperatures ranged from 33.5°C (92.3°F) on August 24 to -7.7°C (18.1°F) on November 29.

Missing Data and Data Recovery - A summary of missing data and data recovery for the entire six-month period is given in Table 2.2. This table shows the beginning time, ending time and duration of all periods of 6 hours or more missing data for each parameter. It also shows the total percent data recovery for each parameter and the recovered number of hours of joint availability of at least one wind speed, one wind direction and one stability parameter. The number of hours of joint control room availability of those parameters may be the same or less than that listed in the table, depending on whether the final data set includes any hours recovered from strip charts or other methods during periods when the DDAS was unavailable (and not sending data to the control room).

The table shows that data recovery during the July through December period was at least 99.9% for all parameters. However, two data recovery efforts were applied to reach this level.

The first effort involved the 10-meter A wind speed sensor. On September 26 at around 0900 EDT, one of the four blades broke off the instrument's propeller. As a result, the reported wind speeds were consistently lower than those from 10-meter B, or simply reported as calm. The broken propeller was replaced on October 23 at about 1545 EDT. For this 650-hour outage period, the wind speed values from 10-meter B replaced those for 10-meter A. Since the wind direction and sigma-theta readings were usually not affected by this breakage, those readings were still used. However, when calm winds were reported by 10-meter A, the 10-meter B wind direction and sigma-theta readings were again substituted.

The second effort involved the 10-meter temperature sensor. All during 2023, the 10-meter temperature readings would occasionally contain up/down spikes and/or offsets. An analysis discovered that these anomalies usually occurred when precipitation was falling or soon thereafter. The spiking values were removed by passing the 1-minute PPC records through a statistical outlier technique. The resulting temperatures were then compared to those from the nearby South Haven Lighthouse and South Haven Airport weather stations. These comparisons identified when the offsets were occurring and the appropriate corrections that need to be applied.

Due to these restoration efforts, the reported availability of at least one wind speed, one wind direction and one stability parameter was 4416/4416 hours, or 100.0%. A summary of missing data and data recovery for the entire six-month period is given in Table 2.3.

Computer Halts – No computer halts occurred during this 6-month period.

Calibrations and Sensor Maintenance – This year's only system calibration was performed during October 18-23, November 15-16, and December 28. Aside from the 10-meter A broken propeller problem, all sensors were found and left within the calibration accuracy tolerances.

In preparation for the winter season, all wind sensor bearings and potentiometers were changed as necessary prior to their installations.

During the October calibration, the 10-meter wiring was thoroughly inspected, but no issues were discovered. However, the metal junction box at 10-meters was found to contain several significant rust holes. These holes allowed water from precipitation, etc., to impact the contained terminal blocks for all sensors. This discovery likely explains the sporadic temperature spikes that have occurring since 2022.

During the November calibration, the junction box holes were temporarily fixed. In addition, a damaged 60-meter cable was found and replaced.

A new wind sensor was purchased in November and was calibrated during December.

10-meter Wind Speeds – As noted in last year's semi-annual report, the 10-meter wind speeds have been declining since 2006. An analysis surmized that the surrounding and growing/thickening forest was at fault. This year's report shows that this decline has continued, with new lowest-speed records being set as a result.

In an e-mail, Holtec noted that, during the summer, they had reviewed the regulatory requirements for and performed a walkdown of the meteorological tower. The inspection found that the area around the tower is clear cut in every direction for about 90 feet. Beyond that, it is forest. Although the top of the trees are slightly above the 10-meter sensor, they are sufficiently far away such that the regulatory guidance would not require cutting them down. (The guidance basically says for every foot a tree is above the sensor the tree must be 10 feet away from the sensor.)

TABLE 2.2

MISSING DATA SUMMARY FOR
 PERIODS OF 6 HOURS OR MORE
 HOLTEC INTERNATIONAL, INC.
 METEOROLOGY AND AIR QUALITY DATA PROCESSING
 DATA PERIOD: 23010701 TO 23123124

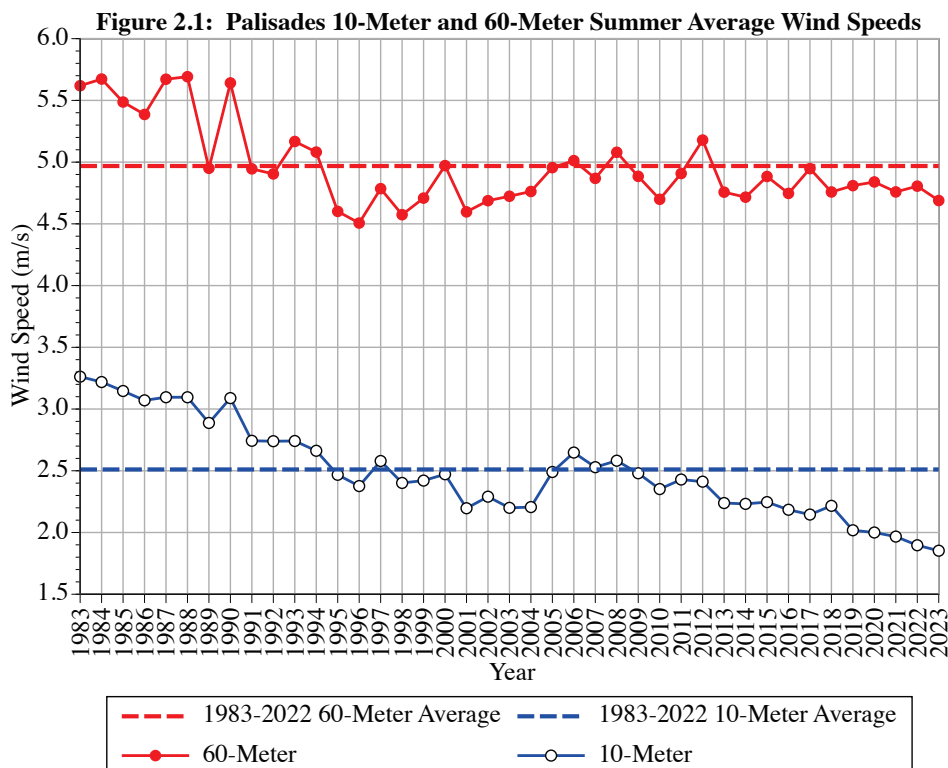
| | | -----PALISADES----- | | | | | | | |
|---------------------------------------------------------------------------------------|----------|---------------------|----------|----------|----------|----------|----------|----------|----------|
| | | 10M | 10-60M | 10M | 10M | 10M | 60M | 60M | 60M |
| | | TEMP | DELTA-T | WS | WD | SIGMA | WS | WD | SIGMA |
| | | YYMMDDHH | YYMMDDHH | YYMMDDHH | YYMMDDHH | YYMMDDHH | YYMMDDHH | YYMMDDHH | YYMMDDHH |
| | | NONE | NONE | NONE | NONE | NONE | NONE | NONE | NONE |
| TOTAL | RECOVERY | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 99.9% | 99.9% | 99.9% |
| JOINT DATA | | | | | | | | | |
| AVAILABILITY | | | | | | | | | |
| GROUP | | 0 | 1 | 2 | 3 | 1 | 2 | 3 | 1 |
| 4416 HOURS OF JOINT AVAILABILITY OF AT LEAST ONE VALID PARAMETER FROM EACH OF GROUPS: | | 1 | 2 | 3 | | | | | |
| 4416 HOURS PROCESSED | | | | | | | | | |

2.2 SUMMER 2023

Joint Frequency of Wind Direction, Wind Speed and Stability Class - Data summaries for the summer quarter (June, July, August) 2023 are included in Appendix B. The first seven tables give the joint frequency of 10-meter wind direction and wind speed classes for each of the seven stability classes A-G. The eighth table, labeled ALL CLASSES, gives the summed joint wind frequencies for all stability classes combined. The ninth table, labeled ALL WINDS, gives the joint wind frequencies for all available wind data (regardless of whether stability data are available or not). Immediately following this table is a wind rose, which graphically depicts the data contained in the ALL WINDS table. Following the wind rose are nine more tables and a second wind rose, providing the same information for the 60-meter level.

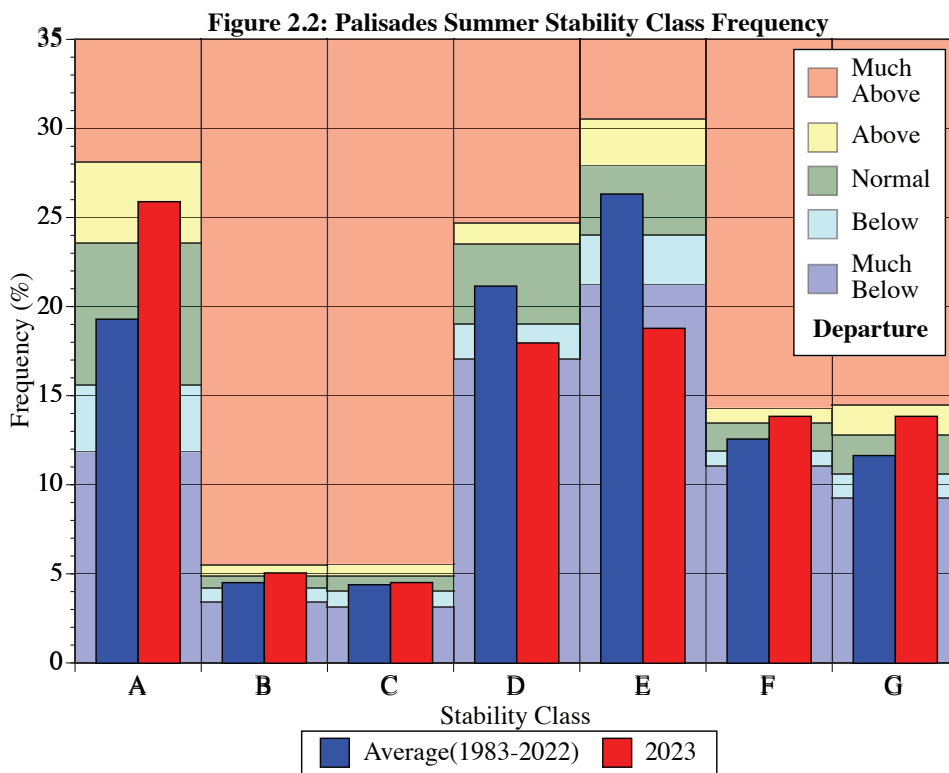
Examination of the wind roses and ALL WINDS tables shows that the two most frequently occurring directions at the 10-meter level were NNW and NW, accounting for nearly 25% of all observations. At 60 meters, the two predominant directions were N and NNW, accounting for almost 22% of all observations. The highest average speeds were associated with SE winds at 10 meters and N winds at 60 meters. The mean speed for all directions at 10 meters was 1.85 m/s (4.14 mph), and at 60 meters was 4.69 m/s (10.49 mph). Compared to last summer, the 10-meter was 0.05 m/s (0.11 mph) lower while the 60-meter speed was 0.12 m/s (0.27 mph) lower.

When compared to the 1983-2022 summer averages of 2.51 m/s (5.61 mph) and 4.97 m/s (11.12 mph), respectively, the 10 meter speed is 0.66 m/s (1.48 mph) lower while the 60-meter speed is 0.28 m/s (0.63 mph) lower. The time series of the summer average wind speeds at 10 and 60 meters is shown in Figure 2.1. This summer's 60-meter speed was the sixth lowest while the 10-meter speed was the lowest since monitoring began at Palisades.

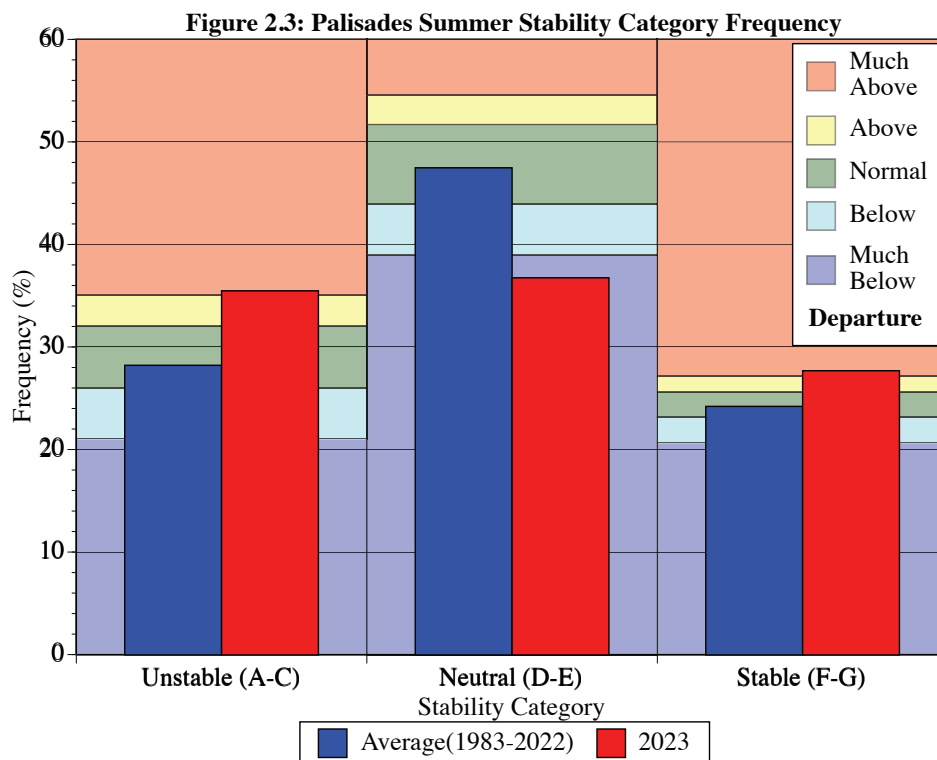


Distribution of Wind Direction by Stability Class - The next two tables summarize wind direction frequencies as a function of stability class for the 10 and 60 meter levels respectively. The upper number of each table entry is the relative percent frequency of occurrence within stability class, and is comparable only to other upper-position numbers within its column. The lower number of each table entry is the relative frequency of occurrence for all classes and directions, and is comparable to all other lower-position numbers in the table.

The results for the two levels are similar. As Figure 2.2 shows, the distribution of stability classes for all wind directions (TOTAL) was ranked as Above Normal for the A, B, F, and G classes, Normal for the C class, Below Normal for the D class, and Much Below Normal for the E class. This summer's E class frequency of 19% was the second lowest since records began at Palisades



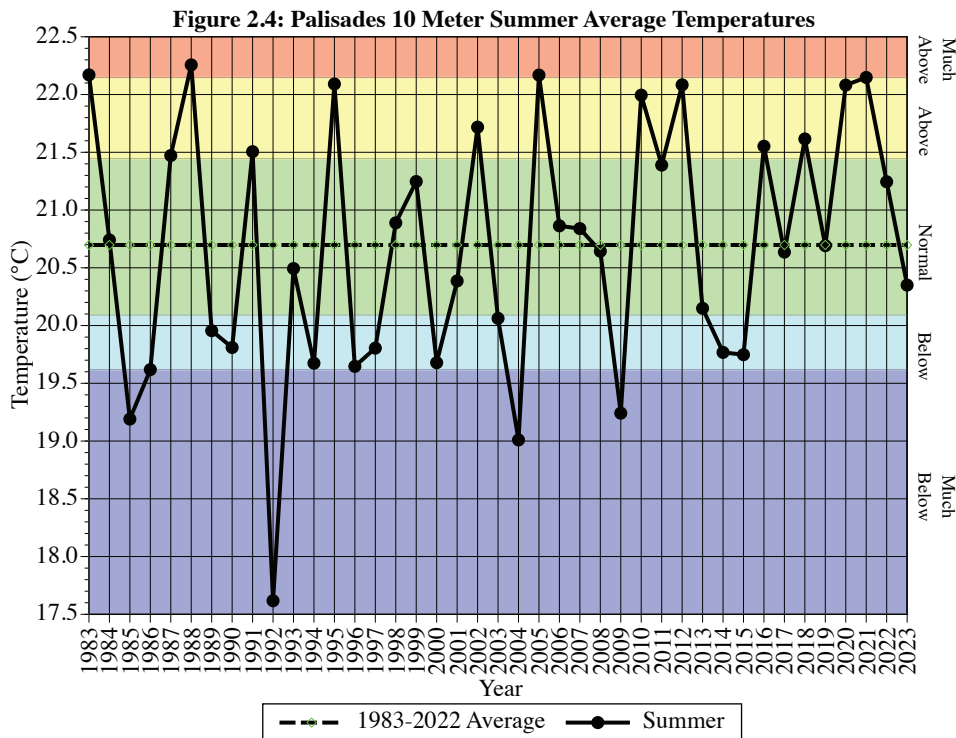
Overall, 35% of all observations were Unstable (A-C), 37% Neutral (D-E), and 28% Stable (F-G). As shown in Figure 2.3, the Unstable and Stable groups were ranked Much Above Normal while the Neutral group was ranked Much Below Normal. This summer's Neutral group frequency of 37% was the second lowest since monitoring began at Palisades.



Wind Direction Persistence - The final four tables (two pages each) show the frequency of occurrence of wind remaining within a 22.5° and a 45° sector centered on 5° intervals, for various duration categories, for the 10 meter and 60 meter levels, respectively. (Note: the values given in this report are based on the corrected/updated wind persistence methodology.)

Examination of these tables shows that longer maximum persistences and more occurrences in the longer duration categories occur with the wider (45°) sector at both levels. Average wind speeds increase with increasing duration length for both levels and both sector widths. At 10 meters, the longest durations were 25 hours for a 22.5° sector centered on 160°, and 35 hours for 45° sectors centered on 320°, 325°, and 330°. At 60 meters, the longest durations were 19 hours for 22.5° sector centered on 240°, and 34 hours for 45° sectors centered on 220° and 335°.

Temperature - The summer average temperature was 20.4°C (68.7°F). This average is 0.3°C (0.9°F) cooler than the 1983-2022 mean of 20.7°C (69.3°F) and 0.8°C (1.4°F) cooler than last summer. The time series of the summer average temperatures as well as the 1983-2022 average and departure categories are shown in Figure 2.4. As can be seen, the 2023 summer temperature was ranked as Normal.

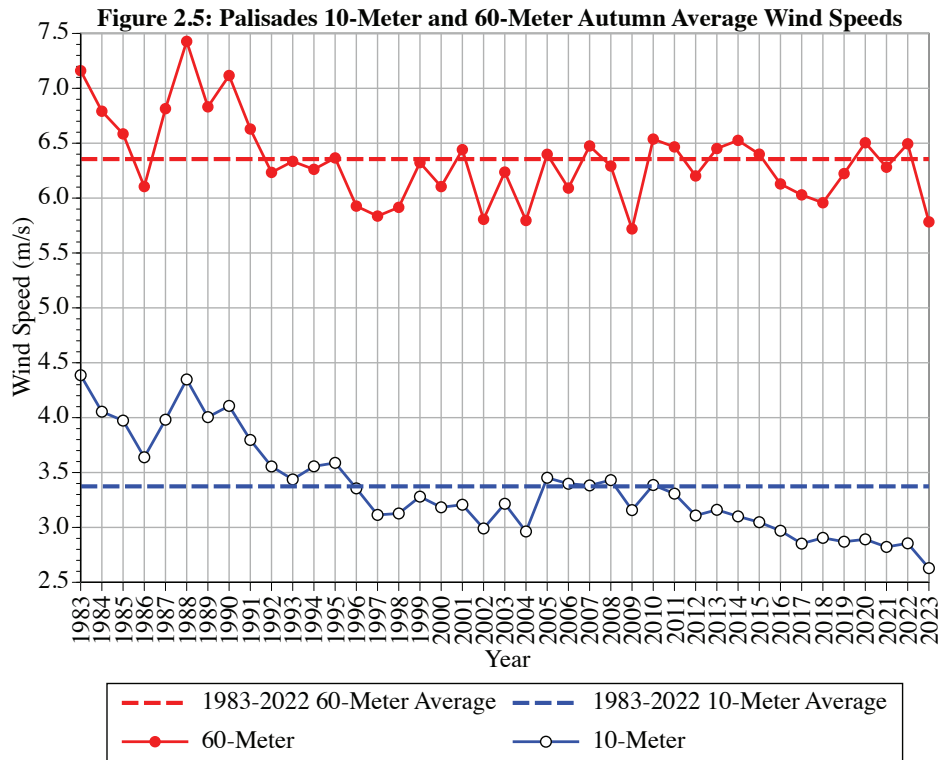


2.3 AUTUMN 2023

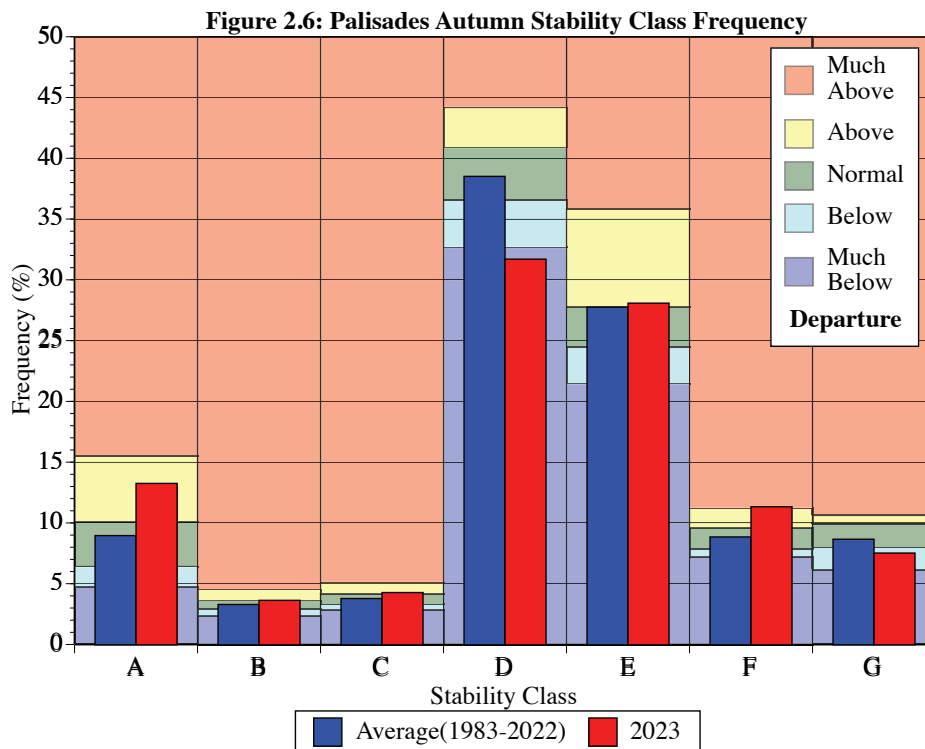
Joint Frequency of Wind Direction, Wind Speed and Stability Class - Data summaries for the autumn quarter (September, October, November) 2023 are included in Appendix C. The order of the tables and figures is the same as that for summer.

Examination of the wind roses and ALL WINDS tables shows that the two most frequently occurring directions at the 10-meter level were SSE and SE, accounting for over 31% of all observations. At 60 meters, the two predominant directions were S and SSE, accounting for over 22% of all observations. The highest average speeds were associated with SE winds at 10 meters and with NW winds at 60 meters. The mean speed for all directions at 10 meters was 2.63 m/s (5.88 mph), and at 60 meters was 5.78 m/s (12.93 mph). Compared to last autumn, the 10-meter speed is 0.24 m/s (0.54 mph) lower while the 60-meter speed is 0.74 m/s (1.66 mph) lower.

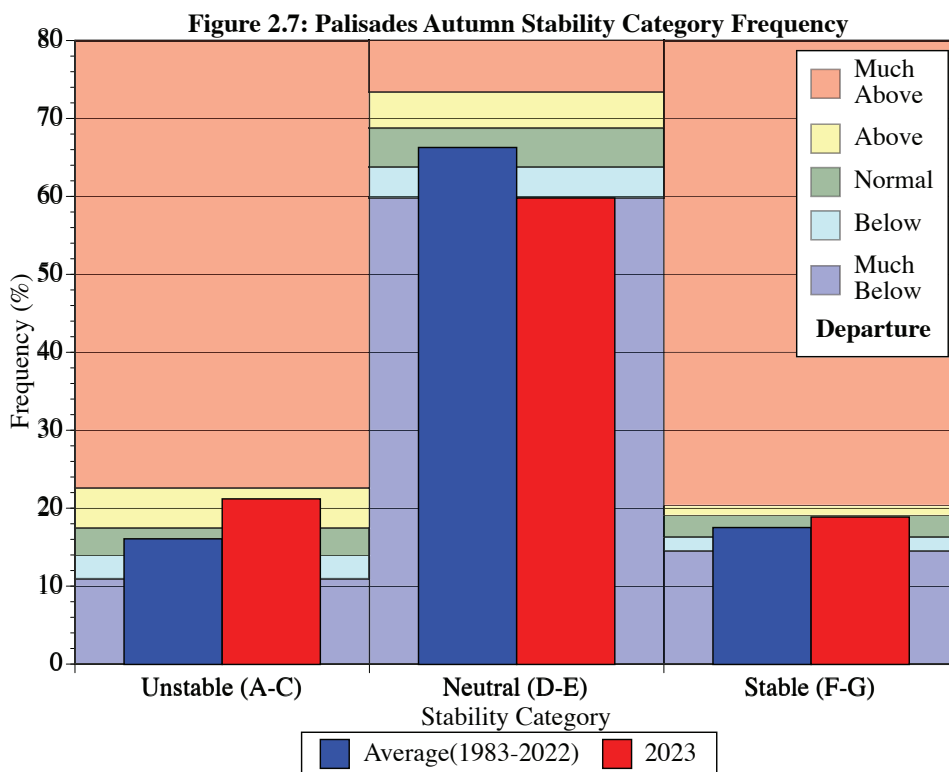
When compared to the 1983-2022 autumn averages of 3.37 m/s (7.54 mph) and 6.36 m/s (14.23 mph), respectively, the 10 meter speed is 0.74 m/s (1.66 mph) lower while the 60 meter speed is 0.53 m/s (1.30 mph) lower. The time series of the autumn average wind speeds at 10 and 60 meters is shown in Figure 2.5. As can be seen, this autumn's average 10-meter speed was the lowest while the average 60-meter speed was the second lowest since monitoring began at Palisades.



Distribution of Wind Direction by Stability Class - The results for the two levels are similar. With increased autumn cloudiness and higher wind speeds, the stability class distribution shows more neutral and fewer unstable and stable occurrences than in the summer. As Figure 2.6 shows, the distribution of stability classes for all wind directions (TOTAL) was Much Above Normal for the F class, Above Normal for the A, B, C, and E classes, Below Normal for the G class, and Much Below Normal for the D class.

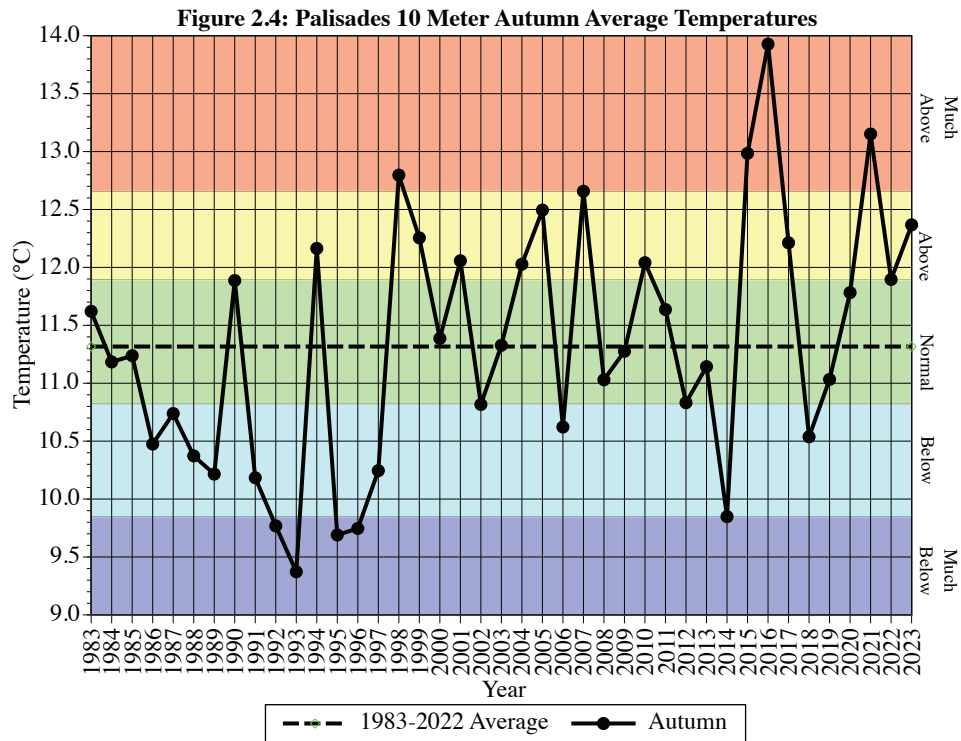


Overall, 21% of all observations were Unstable (A-C), 60% Neutral (D-E), and 19% Stable (F-G). As shown in Figure 2.7, these values reveal a notable shift from the Neutral to the Unstable group than the 1983-2022 averages of 16.1%, 66.3%, and 17.6%, respectively.



Wind Direction Persistence - Examination of these tables shows that as in summer, longer maximum persistences and more occurrences in the longer duration categories occur with the wider (45°) sector at both levels. Average wind speeds increase with increasing duration length for both levels and both sector widths. At 10 meters, the longest durations were 49 hours for a 22.5° sector centered on 135°, and 66 hours for a 45° sector centered on 125°. At 60 meters, the longest durations were 38 hours for a 22.5° sector centered on 220°, and 57 hours for a 45° sector also centered on 220°.

Temperature - The autumn average temperature was 12.4°C (54.3°F). This average is 1.1°C (2.0°F) warmer than the 1983-2022 average of 11.3°C (52.3°F) and 0.5°C (0.9°F) warmer than last autumn. The time series of the autumn average temperatures as well as the 1983-2022 average and departure categories are shown in Figure 2.8. As can be seen, the 2023 autumn season was ranked as Above Normal.



2.4 ANNUAL 2023

Missing Data and Data Recovery - A summary of missing data and data recovery for the entire year is given in Table 2.3. This table contains the monthly, semiannual, and annual number of hours of valid data and percent data recovery by parameter.

The table shows that for the annual period, data recovery for each of the required parameters was at least 97.7%.

TABLE 2.3
PALISADES MISSING DATA SUMMARY
2023

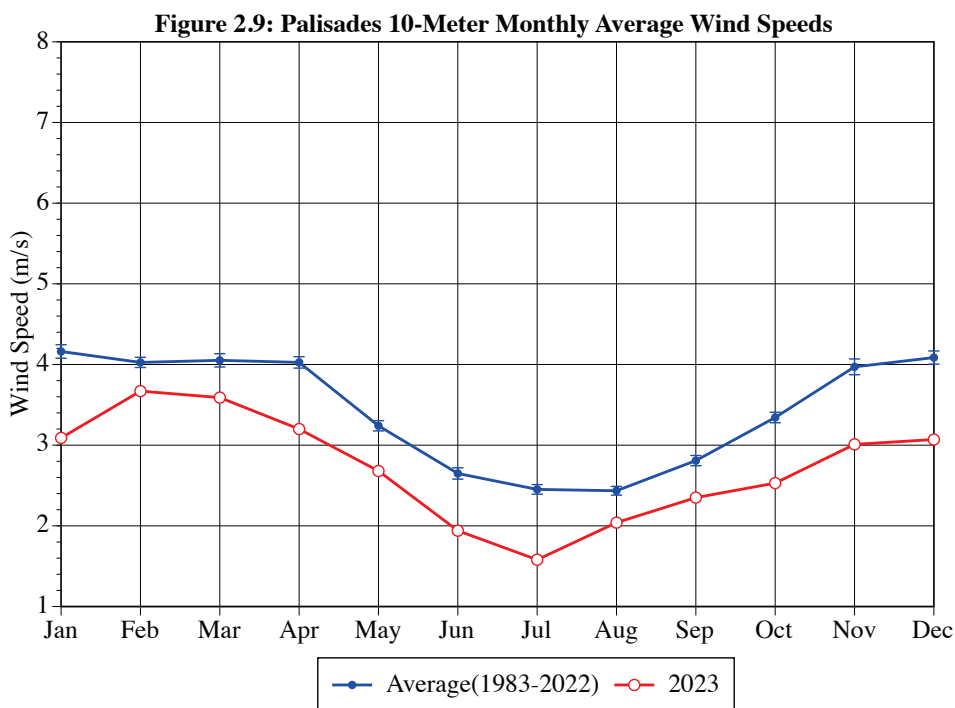
| MONTH | VALID | | | | | | | | TOTAL HOURS |
|---------|-----------|----------|---------|---------|------------|---------|---------|------------|-------------|
| | 10 M TEMP | 60-10 DT | 10 M WD | 10 M WS | 10 M SIGMA | 60 M WD | 60 M WS | 60 M SIGMA | |
| JAN | 546 | 546 | 744 | 742 | 744 | 744 | 742 | 744 | 744 |
| FEB | 672 | 672 | 672 | 672 | 672 | 672 | 672 | 672 | 672 |
| MAR | 744 | 744 | 744 | 744 | 744 | 744 | 744 | 744 | 744 |
| APR | 720 | 720 | 720 | 720 | 720 | 720 | 720 | 720 | 720 |
| MAY | 742 | 742 | 742 | 742 | 742 | 742 | 742 | 742 | 744 |
| JUN | 720 | 720 | 720 | 720 | 720 | 720 | 720 | 720 | 720 |
| JUL | 744 | 744 | 744 | 744 | 744 | 744 | 744 | 744 | 744 |
| AUG | 744 | 744 | 744 | 744 | 744 | 744 | 744 | 744 | 744 |
| SEP | 720 | 720 | 720 | 720 | 720 | 720 | 720 | 720 | 720 |
| OCT | 744 | 744 | 744 | 744 | 744 | 744 | 744 | 744 | 744 |
| NOV | 720 | 720 | 720 | 720 | 720 | 716 | 716 | 716 | 720 |
| DEC | 744 | 744 | 744 | 744 | 744 | 743 | 743 | 743 | 744 |
| TOT/AVG | 8560 | 8560 | 8758 | 8756 | 8758 | 8753 | 8751 | 8753 | 8760 |
| JAN-JUN | 4144 | 4144 | 4342 | 4340 | 4342 | 4342 | 4340 | 4342 | 4344 |
| JUL-DEC | 4416 | 4416 | 4416 | 4416 | 4416 | 4411 | 4411 | 4411 | 4416 |

| MONTH | RECOVERY | | | | | | | |
|---------|-----------|----------|---------|---------|------------|---------|---------|------------|
| | 10 M TEMP | 60-10 DT | 10 M WD | 10 M WS | 10 M SIGMA | 60 M WD | 60 M WS | 60 M SIGMA |
| JAN | 73.4% | 73.4% | 100.0% | 99.7% | 100.0% | 100.0% | 99.7% | 100.0% |
| FEB | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| MAR | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| APR | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| MAY | 99.7% | 99.7% | 99.7% | 99.7% | 99.7% | 99.7% | 99.7% | 99.7% |
| JUN | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| JUL | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| AUG | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| SEP | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| OCT | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| NOV | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 99.4% | 99.4% | 99.4% |
| DEC | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 99.9% | 99.9% | 99.9% |
| TOT/AVG | 97.7% | 97.7% | 100.0% | 100.0% | 100.0% | 99.9% | 99.9% | 99.9% |
| JAN-JUN | 95.4% | 95.4% | 100.0% | 99.9% | 100.0% | 100.0% | 99.9% | 100.0% |
| JUL-DEC | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 99.9% | 99.9% | 99.9% |

Joint Frequency of Wind Direction, Wind Speed and Stability Class - Data summaries for the calendar year (January - December) 2023 are included in Appendix D. The order of the tables and figures is the same as that for summer and autumn.

Examination of the wind roses and ALL WINDS tables shows that the two most frequently occurring directions for the year at the 10 meter level were SSE and SE, accounting for over 23% of all observations. At 60 meters, the two predominant directions were SW and S, accounting for about 17% of all observations. The highest average speeds were associated with SE winds at 10 meters and NW winds at 60 meters. The mean speed for all directions at 10 meters was 2.72 2.78 m/s (6.08 mph), and at 60 meters was 5.63 5.74 m/s (12.59 mph). When compared to last year, the 10-meter average is 0.06 m/s (0.13 mph) lower while the 60-meter average is 0.11 m/s (0.25 mph) lower. Data from this report and the January - June semiannual report show that the highest average wind speeds occurred in the winter months and the lowest average speeds occurred in the summer months.

Figures 2.9 and 2.10 present a comparison of the 2023 monthly wind speed averages to the 1983-2022 monthly averages (with standard error bars) at the 10-meter and 60 meter levels, respectively. As Figure 2.9 indicates, at the 10-meter level, the 2023 averages for all months ranged from 0.36 to 1.07 m/s (0.81 to 2.39 mph) lower than their 1983-2022 averages. As a result, the 2023 10-meter average of 2.72 m/s (6.08 mph) was 0.71 m/s (1.59 mph) lower than the 1983-2022 average of 3.43 m/s (7.67 mph).



In Figure 2.10, at the 60-meter level, the 2023 averages for February and August were 0.23 and 0.27 m/s (0.51 and 0.60 mph), respectively higher than their 1983-2022 averages. The remaining 10 months ranged from 0.05 to 1.23 m/s (0.11 to 2.75 mph) lower than their long-term averages. As a result, the 2023 60-meter average of 5.63 m/s (12.59 mph) was 0.43 m/s (0.96 mph) lower than the 1983-2022 average of 6.06 m/s (13.56 mph).

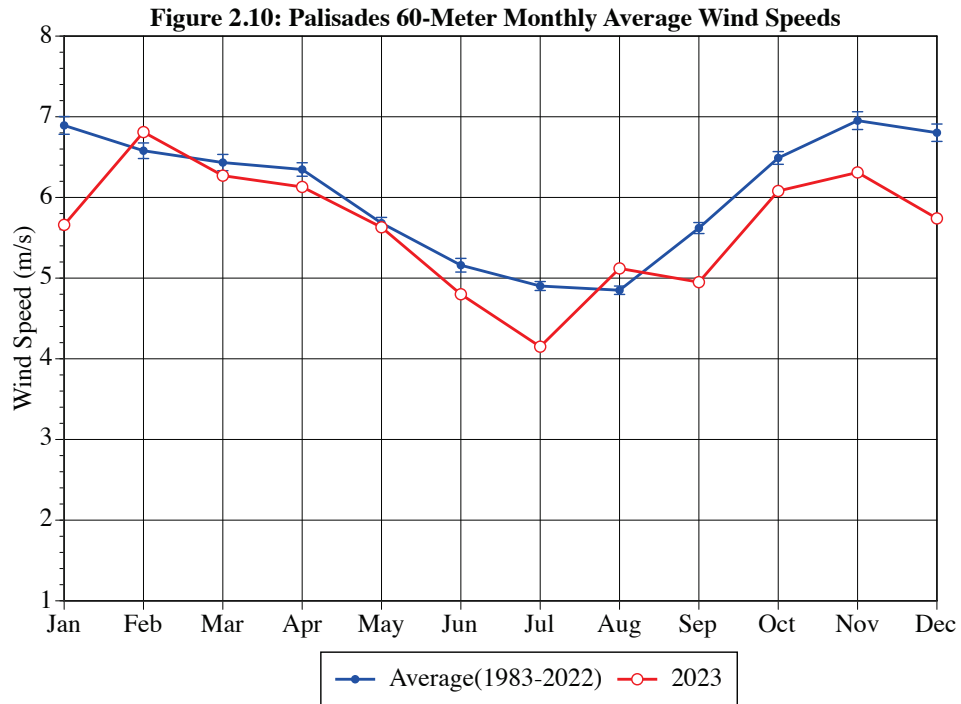
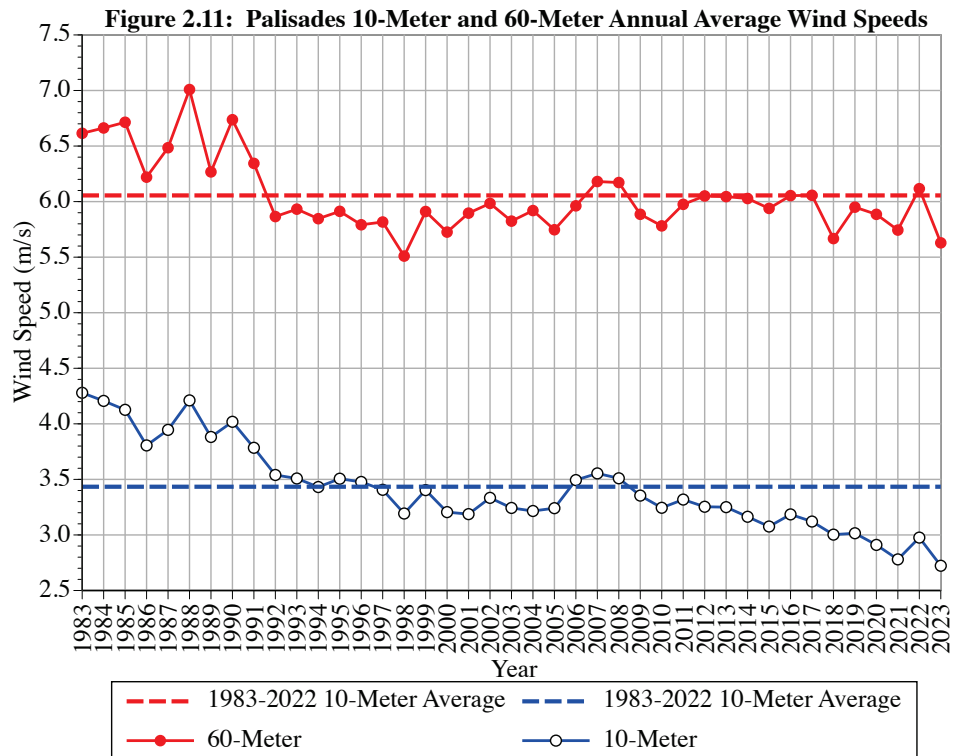
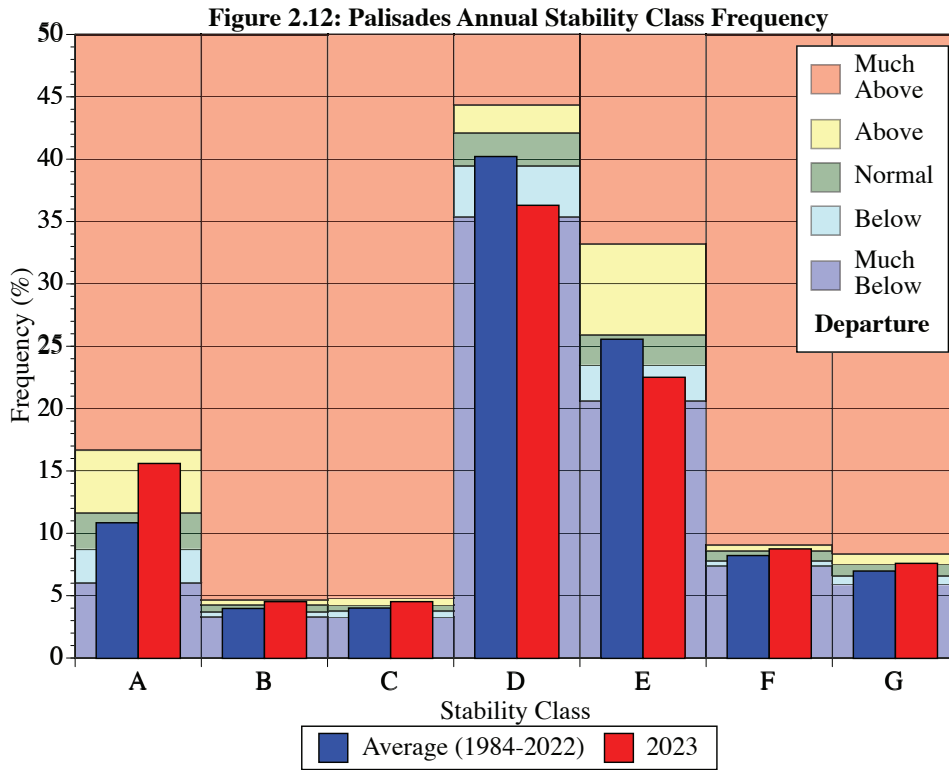


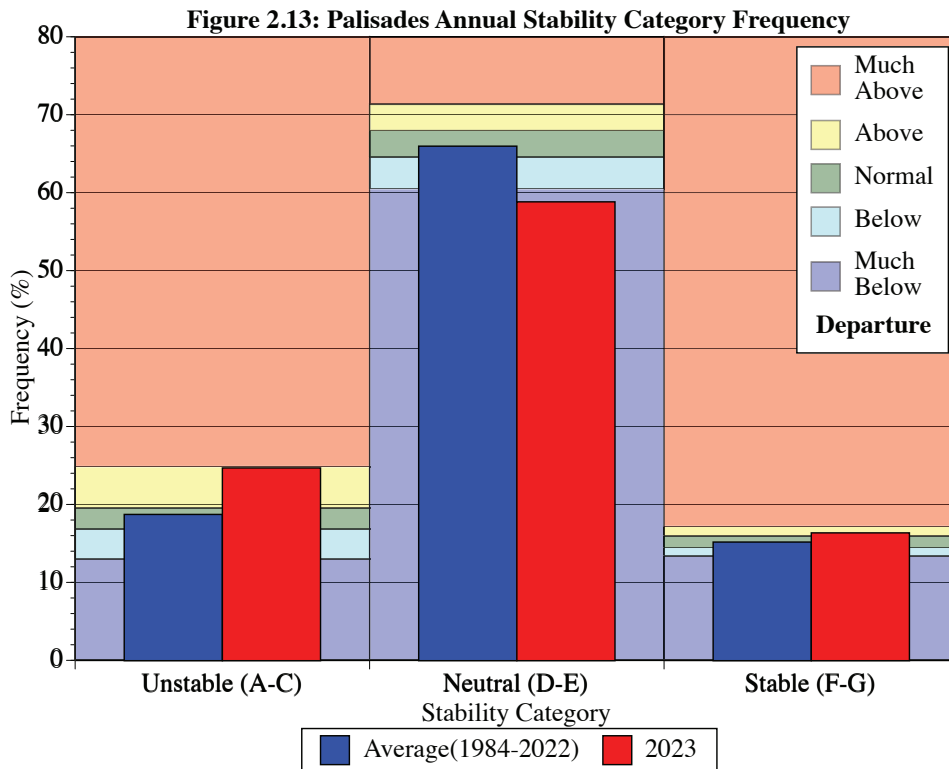
Figure 2.11 shows the times series of the annual average wind speeds at 10 and 60 meters, and their respective 1983-2022 averages. As shown, the 2023 10-meter speed was again the lowest while the 60-meter speed was the second lowest since monitoring began at Palisades.



Distribution of Wind Direction by Stability Class - Figure 2.12 shows that the distributions were Below Normal for the D and E classes while Above Normal for the remaining 5 classes.

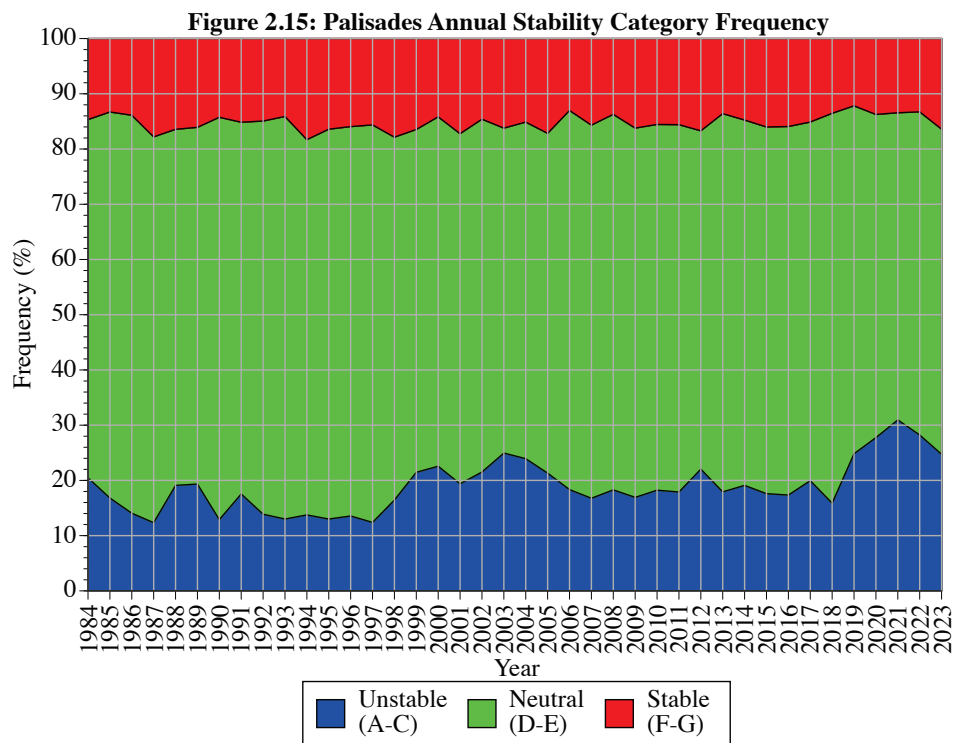
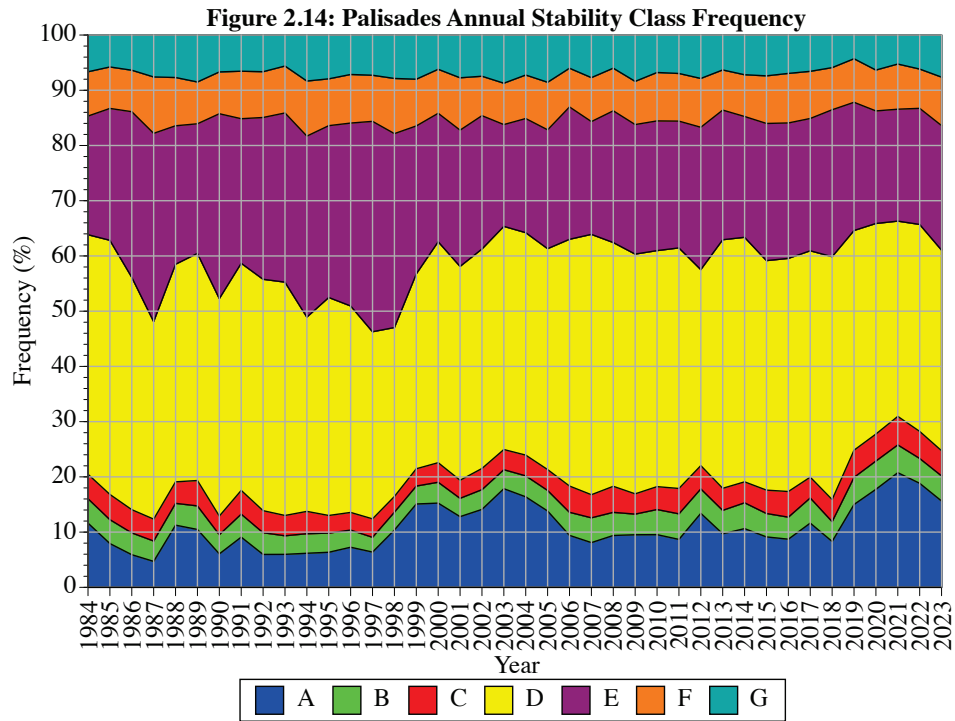


Overall, 25% were Unstable (A-C), 59% Neutral (D-E), and 16% Stable (F-G). As shown in Figure 2.13, these values show a notable shift toward the Unstable category than the 1984-2022 averages of 18.8%, 66.0%, and 15.2%, respectively.



Figures 2.14 and 2.15 display the 1984-2023 annual stability frequencies by class and by category, respectively. As can be seen, this year's

unstable and neutral levels were the sixth highest and fifth lowest, respectively, since monitoring began at Palisades.



Wind Direction Persistence - Examination of these tables shows that at 10 meters, the longest durations were 67 hours for 22.5° sectors centered on 135° and 150°, and 66 hours for a 45° sector centered on 125°. At 60 meters, the longest durations were 40 hours for a 22.5° sector centered on 230°, and 62 hours for a 45° sector centered on 220°.

Temperature - Figure 2.16 compares the 2023 monthly 10-meter temperatures to their 1983-2022 averages and departure categories. As the Figure indicates, January and December were Much Above Normal while February, April, September, and October were Above Normal. The remaining 6 months were Normal. This year's December was the second warmest since monitoring began at Palisades.

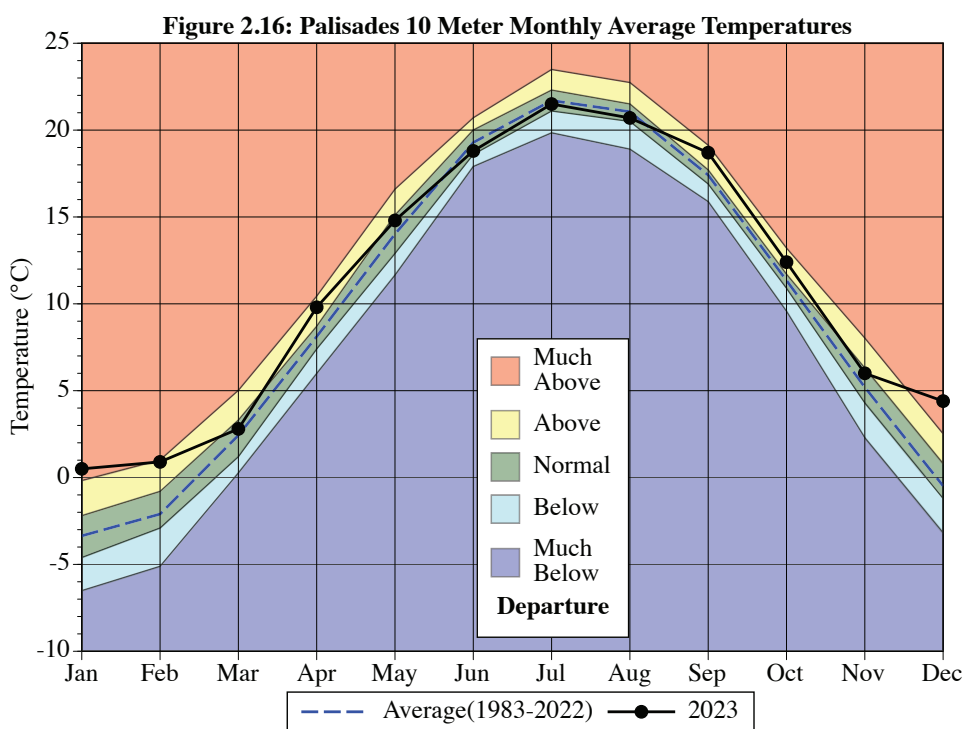
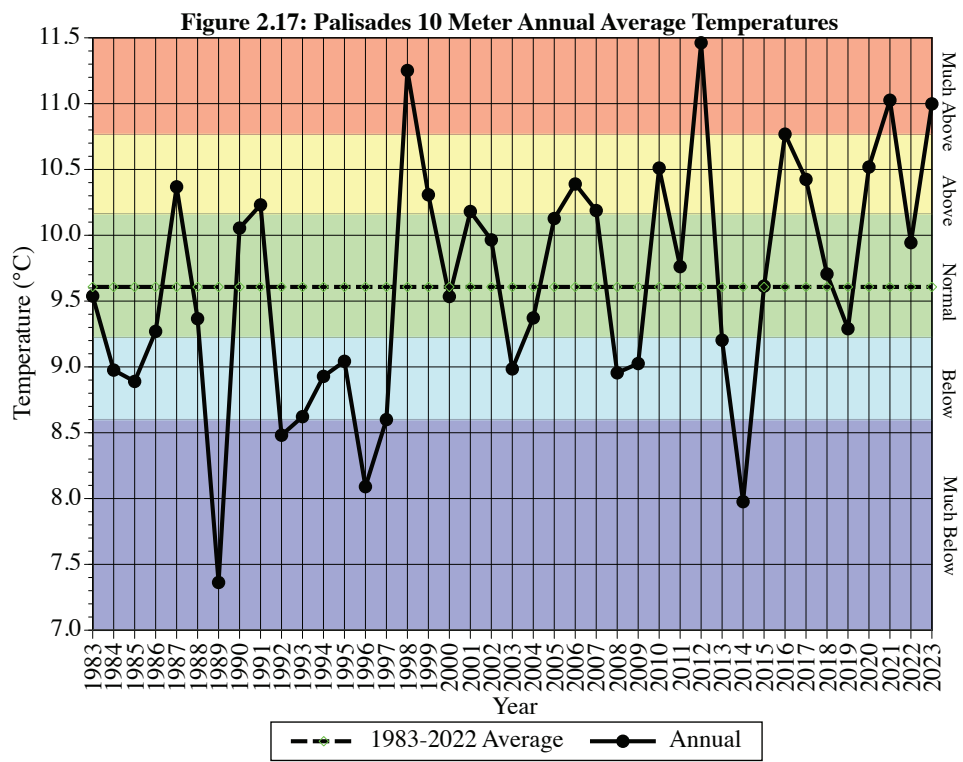


Figure 2.17 shows the time series of the Palisades annual average temperatures at 10 meters as well as the 1983-2022 average and the departure categories. The 2023 average temperature of 11.0°C (51.8F) was 1.4°C (2.5°F) warmer than the 1983-2022 average of 9.6°C (49.3°F). As a result, the 2023 annual temperature was the fourth warmest since monitoring began at Palisades and ranked as Much Above Normal.



3.0 SUMMARY

Hourly meteorological data for Palisades for the period 0100 EST July 1, 2023 - 2400 EST December 31, 2023 were presented and summarized. During this period, two sensor problems arose, initially causing a sizeable amount of missing data. However, via various methods, most of the data were restored. As a result, data recovery was at least 97.7% for all required parameters.

Only one system calibration was performed during this year and it took place during October 18-23, November 15-16, and December 28. All sensors, except 10-meter wind speed, were found and left within the calibration accuracy tolerances. In preparation for the winter season, the bearings and potentiometers were replaced, as needed, in the three wind sensors.

On September 26, the 10-meter A sensor's propeller somehow lost one of its four blades. The propeller was replaced on October 23. The 10-meter B wind speed data were substituted for the impacted 10-meter A readings.

During the October calibration, rust holes were found in the 10-meter junction box. These holes allowed water from precipitation, etc. to affect the contained terminals blocks for all sensors. This intrusion likely caused the sporadic 10-meter temperature spiking problems that have occurred since 2022.

Several noteworthy meteorological conditions occurred at Palisades during this 6-month period and annually. They are outlined in the table below:

| Meteorological Condition | |
|---------------------------------|-------------------------------------------|
| Period | Description |
| Summer | Lowest 10-meter Average Wind Speed |
| | Second Lowest Neutral Group Frequency |
| Autumn | Lowest 10-meter Average Wind Speed |
| | Second Lowest 60-meter Average Wind Speed |
| | Above Normal Average Temperature |
| Annual | Lowest 10-meter Average Wind Speed |
| | Second Lowest 60-meter Average Wind Speed |
| | Fourth Warmest Average Temperature |
| | Much Below Normal Neutral Group Frequency |
| December | Second Warmest Average Temperature |

Enclosure 12
HDI PNP 2024-037

Enclosure 12

HDI PNP 2024-037

Response to Request for Additional Information –

RAI-MET-5

**Regarding the Proposed Reauthorization of Power Operations of
Palisades Nuclear Plant Under
Renewed Facility Operating License No. DPR-20**

NRC RAI Number: RAI-MET-5

If there are any restart-related activities that would produce pollutant emissions (e.g., from construction equipment), then provide information on these emissions, including emissions estimates of fugitive dust and best management practices.

This information was not included in the Enclosure 2, "Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant" submittal.

HDI Response to RAI:

The restart activities are presented in Enclosure 1. No additional emission equipment units are expected or required for restart activities or resumption of operations. Emissions expected during restart activities include the completion of emission unit maintenance and any required endurance testing prior to restart.

References:

None.

Associated Attachments:

None.

Enclosure 13
HDI PNP 2024-037

Enclosure 13
HDI PNP 2024-037
Response to Request for Additional Information –
RAI-MET-6
Regarding the Proposed Reauthorization of Power Operations of
Palisades Nuclear Plant Under
Renewed Facility Operating License No. DPR-20

NRC RAI Number: RAI-MET-6

Provide annual pollutant emissions (including criteria pollutants) since 2022, if any. The U.S. Environmental Protection Agency (EPA) has set National Ambient Air Quality Standards for criteria pollutants. Air quality emissions for a plant are regulated through permits. NRC staff review air emissions to verify compliance with permitting to support the NRC staff making environmental impact determinations under NEPA. Permitted annual emissions (including criteria pollutants) have been documented in the Enclosure 2, table 3.7-2 from year 2018-2022. There is no information past 2022 included in the Enclosure 2, *“Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant”* submittal.

HDI Response to RAI:

PNP Annual Emissions for 2023 (pounds per year) is presented in the emissions report included in Attachment 1.

References:

None.

Associated Attachments:

1. 2023 Emissions Inventory Report

Enclosure 13
Attachment 1
HDI PNP 2024-037

HDI PNP 2024-037

Enclosure 13

Attachment 1 - 2023 Emissions Inventory Report

31 pages follow

| 2023 Emissions Inventory Report | | | |
|-----------------------------------------------------------------------|-----------------------------|------------|-------------------------|
| Palisades Nuclear Plant (B2934) | | | |
| Emissions Summary | | | |
| CRITERIA AIR POLLUTANT (CAP) EMISSIONS TOTALS | | | |
| Pollutant Code/CAS # | Pollutant Name | | Total Emissions (tons)* |
| CO | Carbon Monoxide | | 0.60564 |
| 7439921 | Lead | | 0.00013 |
| NOX | Nitrogen Oxides | | 2.83568 |
| PM10-PRI | PM10 Primary (Filt + Cond) | | 0.25133 |
| PM10-FIL | PM10 Filterable | | 0.11299 |
| PM25-PRI | PM2.5 Primary (Filt + Cond) | | 0.1719 |
| PM25-FIL | PM2.5 Filterable | | 0.03355 |
| PM-CON | PM Condensable | | 0.138 |
| SO2 | Sulfur Dioxide | | 0.01674 |
| VOC | Volatile Organic Compounds | | 0.03295 |
| TNMOC | TNMOC | | 0.02114 |
| TOG | TOTAL ORGANIC GAS | | 0.00392 |
| NH3 | Ammonia | | 0.08455 |
| HAZARDOUS AIR POLLUTANT (HAP) and/or OTHER POLLUTANT EMISSIONS TOTALS | | | |
| Pollutant Code/CAS # | Pollutant Name | Is VOC/PM? | Total Emissions (tons)* |
| CO2 | Carbon Dioxide (GHG) | - | 14.8256 |
| CH4 | Methane (GHG) | - | 0.00614 |
| N2O | Nitrous Oxide (GHG) | - | 0.01163 |
| 106990 | 1,3-Butadiene (HAP) | VOC | <.00001 |
| 83329 | Acenaphthene (HAP) | - | <.00001 |
| 208968 | Acenaphthylene (HAP) | - | <.00001 |
| 75070 | Acetaldehyde (HAP) | VOC | 0.00001 |
| 107028 | Acrolein (HAP) | VOC | <.00001 |
| 120127 | Anthracene (HAP) | - | <.00001 |
| 7440382 | Arsenic (HAP) | - | 0.00006 |
| 56553 | Benz[a]Anthracene (HAP) | - | <.00001 |
| 71432 | Benzene (HAP) | VOC | 0.00007 |

| Pollutant Code/CAS # | Pollutant Name | Is VOC/PM? | Total Emissions (tons)* |
|-----------------------------------------------------------------------------------------------------------|-------------------------------|------------------------------------|------------------------------------------|
| 50328 | Benzo[a]Pyrene (HAP) | - | <.00001 |
| 205992 | Benzo[b]Fluoranthene (HAP) | - | <.00001 |
| 191242 | Benzo[g,h,i,j]Perylene (HAP) | - | <.00001 |
| 207089 | Benzo[k]Fluoranthene (HAP) | - | <.00001 |
| 7440417 | Beryllium (HAP) | - | 0.00004 |
| 7440439 | Cadmium (HAP) | - | 0.00004 |
| 7440473 | Chromium (HAP) | - | 0.00004 |
| 218019 | Chrysene (HAP) | - | <.00001 |
| 53703 | Dibenzo(a,h)Anthracene (HAP) | - | <.00001 |
| 206440 | Fluoranthene (HAP) | - | <.00001 |
| 86737 | Fluorene (HAP) | - | <.00001 |
| 50000 | Formaldehyde (HAP) | VOC | 0.00509 |
| 193395 | Indeno[1,2,3-c,d]Pyrene (HAP) | - | <.00001 |
| 7439965 | Manganese (HAP) | - | 0.00009 |
| 7439976 | Mercury (HAP) | - | 0.00004 |
| 91203 | Naphthalene (HAP) | VOC | 0.00001 |
| 7440020 | Nickel (HAP) | - | 0.00004 |
| 130498292 | PAH, total (HAP) | - | 0.00002 |
| 85018 | Phenanthrene (HAP) | - | <.00001 |
| 129000 | Pyrene (HAP) | - | <.00001 |
| 7782492 | Selenium (HAP) | - | 0.00022 |
| 108883 | Toluene (HAP) | VOC | 0.00003 |
| 1330207 | Xylenes (Mixed Isomers) (HAP) | VOC | 0.00002 |
| EMISSIONS TOTALS | | | |
| | | Total CAP Emissions (tons)* | Total HAP/OTHER Emissions (tons)* |
| | | 4.30852 | 14.84919 |
| | | | Total Emissions (tons)* |
| | | | 19.15771 |
| *Rounded to 5 digits past the decimal point. Note that where rounding results in 0, <.00001 is indicated. | | | |

2023 Emissions Report
Palisades Nuclear Plant (B2934)

FACILITY

| | | | |
|-----------------------------|------------------------------------------------------|-----------------------|-------------------------|
| Facility Identifier: | B2934 | Facility Name: | Palisades Nuclear Plant |
| Company/Owner Name: | Holtec Palisades, LLC | | |
| Description: | Electric Power | | |
| Status: | OP - Operating | Status Year: | |
| NAICS: | 221113 (Primary) - Nuclear Electric Power Generation | | |
| Comments: | | | |

ADDRESS

Location Address: 27780 Blue Star Memorial Hwy.
COVERT, MI 49043

LOCATION

| | | | | | |
|------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|------------------|----|
| Latitude (decimal degrees): | 42.3233 | Longitude (decimal degrees): | -86.3142 | | |
| UTM X (meters): | 556500 | UTM Y (meters): | 4685650 | UTM Zone: | 16 |
| Collection Method: | 001 - address matching-house number | Data Collection Date: | | | |
| Geographic Reference Point: | 102 - Center of a Facility/System | Geodetic Reference System: | 003 - World Geodetic System of 1984 | | |

| RELEASE POINTS | | | | | |
|-------------------------|---------------|--------------------------------------------------------------------------------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| ID | Type | Description | Status | Details | Location |
| FUG001 (FUGITIVE) | Fugitive Area | Pseudostack (facility-wide fugitive emissions) | OP | Fugitive Height: , Fugitive Width: , Fugitive Length: , Fugitive Angle: | Uses Facility Site Location |
| SV0027 (SV-COOLINGTWRA) | Vertical | Cooling Tower A stack | TS in 2023 | Height: 62.0 FEET, Shape: Circular, Diameter: 28.0 FEET, Temperature: 95.0 F, Flow Rate: 1,180,000.0 ACFM, Velocity: 31.9 FPS, Fenceline Distance: 1,570.0 FEET | Verified Location: No, Lat/Long: (42.321140, -86.314426), UTMX/Y/Z: (556491.363213, 4685660.591042, 16) |
| SV0028 (SV-COOLINGTWRE) | Vertical | Cooling Tower B stack | TS in 2023 | Height: 62.0 FEET, Shape: Circular, Diameter: 28.0 FEET, Temperature: 95.0 F, Flow Rate: 1,180,000.0 ACFM, Velocity: 31.9 FPS, Fenceline Distance: 990.0 FEET | Verified Location: No, Lat/Long: (42.319576, -86.315163), UTMX/Y/Z: (556432.031651, 4685486.441992, 16) |
| SV0024 (SV-SECURITYGEN) | Horizontal | Stack associated with new emergency generator utilized for security operations | OP | Height: 13.5 FEET, Shape: Circular, Diameter: 0.83 FEET, Temperature: 221.0 F, Flow Rate: 2,543.0 ACFM, Velocity: 77.70836 FPS | Verified Location: No, Lat/Long: (42.323882, -86.313498), UTMX/Y/Z: (556565.374550, 4685965.667905, 16) |
| SV0001 (SVEVAFHBLR) | Vertical | Evaporator heating boiler stack | OP | Height: 100.0 FEET, Shape: Circular, Diameter: 2.25 FEET, Temperature: 370.0 F, Flow Rate: 6,500.0 ACFM, Velocity: 27.2 FPS | Verified Location: No, Lat/Long: (42.323319, -86.314535), UTMX/Y/Z: (556480.432560, 4685902.465847, 16) |
| SV0003 (SVGEN1) | Horizontal | Emergency generator stack #1. | OP | Height: 50.0 FEET, Shape: Circular, Diameter: 1.83 FEET, Temperature: 800.0 F, Flow Rate: 9,000.0 ACFM, Velocity: 57.0 FPS | Verified Location: No, Lat/Long: (42.323292, -86.314256), UTMX/Y/Z: (556503.445658, 4685899.653107, 16) |
| SV0004 (SVGEN2) | Horizontal | Emergency generator stack #2. | OP | Height: 50.0 FEET, Shape: Circular, Diameter: 1.83 FEET, Temperature: 800.0 F, Flow Rate: 9,000.0 ACFM, Velocity: 57.0 FPS | Verified Location: No, Lat/Long: (42.323282, -86.314233), UTMX/Y/Z: (556505.349753, 4685898.558021, 16) |
| SV0023 (SVGEN3) | Vertical | Emergency generator stack #3 | OP | Height: 13.5 FEET, Shape: Circular, Diameter: 0.67 FEET, Temperature: 846.0 F, Flow Rate: 777.0 ACFM, Velocity: 37.09902 FPS | Verified Location: No, Lat/Long: (42.322186, -86.314703), UTMX/Y/Z: (556467.602930, 4685776.550696, 16) |
| SV0026 (SVGENK-17) | Horizontal | Emergency Generator Stack K-17 | TS in 2023 | Height: 11.0 FEET, Shape: Circular, Diameter: 0.83 FEET, Temperature: 800.0 F, Flow Rate: 4,648.3 ACFM, Velocity: 142.04159 FPS | Verified Location: No, Lat/Long: (42.324153, -86.313922), UTMX/Y/Z: (556530.195647, 4685995.476859, 16) |
| SV0006 (SVFLNHTBLR) | Vertical | Plant heating boiler stack.Replaced like for like in 2019 with new materials. | OP | Height: 100.0 FEET, Shape: Circular, Diameter: 2.25 FEET, Temperature: 370.0 F, Flow Rate: 6,500.0 ACFM, Velocity: 27.24628 FPS | Verified Location: No, Lat/Long: (42.323293, -86.314462), UTMX/Y/Z: (556486.470845, 4685899.627372, 16) |

| CONTROL DEVICES | | | | | |
|---------------------------|----------------|--------|----------------------|----------------------|----------------------------------|
| ID | Description | Status | Control Measure | Uptime/Effectiveness | Controlled Pollutants |
| CD0001 (CDMSTELM-TWRA) | Mst Eliminator | OP | 211 - Mst Eliminator | | PM10-FIL-PM10 Filterable: 99.55% |
| CD0002 (CDMSTELM-TWFB) | Mst Eliminator | OP | 211 - Mst Eliminator | | PM10-FIL-PM10 Filterable: 99.55% |

| CONTROL PATHS | | |
|---------------------|-----------------|-------------------------------------------------|
| ID | Description | Control Path Segments |
| CF0001 (CDPTWRA) | Cooling Tower A | Seq: 1, CD0001 (CDMSTELM-TWRA) (Device): 100.0% |
| CF0002 (CDPTWRB) | Cooling Tower B | Seq: 1, CD0002 (CDMSTELM-TWRB) (Device): 100.0% |

| EMISSION UNITS | | | | |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|------------|---------------------------------------------------|
| ID | Type | Description | Status | Details |
| EU0025 (EJ-SECURITYGEN) | 160 - Reciprocating IC Engine | Emergency generator utilized for security operations. Subject to 40 CFR Part 60 Subpart III (CI IC | OP | Operation Start: , Design Capacity: 762.0 HP |
| | Comment: Description truncated to 100 characters, and has been added fully here:[Emergency generator utilized for security operations. Subject to 40 CFR Part 60 Subpart III (CI IC NSPS).] | | | |
| | Additional Information: Electric Generation: No, Combustion Source: Yes, Install Date: 07/01/2011 | | | |
| EU0017 (EU0017CLEANER) | 490 - Other evaporative sources | Parts cleaner at Palisades. | OP | Operation Start: , Design Capacity: |
| | Additional Information: Emission Unit NAICS: 221113, Electric Generation: No, Combustion Source: No, Install Date: 01/01/1970 | | | |
| EU0011 (EU0011TWRA) | 680 - Cooling Tower | "A" Cooling Tower - capacity - 185,000 gal/min design rating. | TS in 2023 | Operation Start: , Design Capacity: |
| | Additional Information: Emission Unit NAICS: 221113, Electric Generation: No, Combustion Source: No, Install Date: 01/01/1974 | | | |
| EU0012 (EU0012TWFB) | 680 - Cooling Tower | "B" Cooling Tower - capacity - 185,000 gal/min design rating. | TS in 2023 | Operation Start: , Design Capacity: |
| | Additional Information: Emission Unit NAICS: 221113, Electric Generation: No, Combustion Source: No, Install Date: 01/01/1974 | | | |
| EU0013 (EU0013BOILER) | 100 - Boiler | Evaporator heating boiler - heat input rating - 21 MMBtu/hr. | OP | Operation Start: , Design Capacity: 21.0 E6BTU/HR |
| | Additional Information: Emission Unit NAICS: 221113, Electric Generation: No, Combustion Source: Yes, Install Date: 01/01/1970 | | | |
| EU0015 (EUGEN1) | 160 - Reciprocating IC Engine | Emergency Generator #1 - heat input rating - 21.8 MMBtu/hr. | OP | Operation Start: , Design Capacity: 21.8 E6BTU/HR |
| | Additional Information: Emission Unit NAICS: 221113, Electric Generation: No, Combustion Source: Yes, Install Date: 01/01/1970 | | | |
| EU0016 (EUGEN2) | 160 - Reciprocating IC Engine | Emergency Generator #2 - heat input rating - 21.8 MMBtu/hr. | OP | Operation Start: , Design Capacity: 21.8 E6BTU/HR |
| | Additional Information: Emission Unit NAICS: 221113, Electric Generation: No, Combustion Source: Yes, Install Date: 01/01/1970 | | | |
| EU0024 (EUGEN3) | 160 - Reciprocating IC Engine | Emergency Generator #3 - heat input rating - 17.5 MMBtu/hr. | OP | Operation Start: , Design Capacity: 17.5 E6BTU/HR |
| | Additional Information: Emission Unit NAICS: 221113, Electric Generation: No, Combustion Source: Yes, Install Date: 07/01/2006 | | | |
| EU0028 (EUGENK-10) | 160 - Reciprocating IC Engine | Desel-fired emergency fire pump | OP | Operation Start: , Design Capacity: 175.0 HP |
| | Additional Information: Electric Generation: No, Combustion Source: Yes, Install Date: 11/01/1974 | | | |
| EU0032 (EUGENK-17) | 160 - Reciprocating IC Engine | Emergency Generator for Auxiliary Feedwater System Pump. subject to 40CFR60 subpart III. | TS in 2023 | Operation Start: , Design Capacity: 800.0 HP |
| | Additional Information: Emission Unit NAICS: 221113, Electric Generation: No, Combustion Source: Yes, Install Date: 11/03/2018 | | | |
| EU0029 (EUGENK-1A) | 160 - Reciprocating IC Engine | Emergency air compressor operated by gas-fired engine | OP | Operation Start: , Design Capacity: 10.0 HP |
| | Additional Information: Electric Generation: No, Combustion Source: Yes, Install Date: 12/31/1971 | | | |
| EU0030 (EUGENK-1B) | 160 - Reciprocating IC Engine | Emergency air compressor operated by gas-fired engine | OP | Operation Start: , Design Capacity: 10.0 HP |
| | Additional Information: Electric Generation: No, Combustion Source: Yes, Install Date: 12/31/1971 | | | |

| ID | Type | Description | Status | Details |
|---------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----------------------------------------------------------|--------|---------------------------------------------------|
| EJ0027 (EJGENK-5) | 160 - Reciprocating IC Engine | Diesel-fired emergency fire pump engine | OP | Operation Start: , Design Capacity: 175.0 HP |
| Additional Information: Electric Generation: No, Combustion Source: Yes, Install Date: 12/31/1971 | | | | |
| EJ0026 (EJOFFICEBLR) | 100 - Boiler | Fuel oil office heating boiler | OP | Operation Start: , Design Capacity: 2.5 E6BTU/HR |
| Additional Information: Electric Generation: No, Combustion Source: Yes, Install Date: 10/01/1995 | | | | |
| EJ0018 (EJPLANTHEATBLR) | 100 - Boiler | Plant heating boiler - heat input rating - 23.2 MMBtu/hr. | OP | Operation Start: , Design Capacity: 23.2 E6BTU/HR |
| Additional Information: Emission Unit NAICS: 221113, Electric Generation: No, Combustion Source: Yes, Install Date: 01/01/1970 | | | | |

| UNIT PROCESSES | | | | | |
|---------------------------------------------------------|-----------------|----------|------------------------------------------------------------------|------------|------------------------------------------------------------------------------------------|
| Emission Unit ID | Unit Process ID | SCC | Description | Status | Details |
| EU0025 (EJ-SECURITYGEN) | FR0001 | 20200401 | Emergency Generator (762 BHP) for security operations. | OP | Release Point Apportionment: SV0024 (SV-SECURITYGEN), Not Controlled: 100.0% |
| Additional Information: Previous AQDID: 20200401 | | | | | |
| EU0017 (EUCOLDCLEANER) | FR0002 | 40100399 | Cold Cleaner | OP | Release Point Apportionment: FUG001 (FUGITIVE), Not Controlled: 100.0% |
| Additional Information: Previous AQDID: 40100399 | | | | | |
| EU0011 (EUCOOLTWRA) | FR0001 | 38500101 | Mechanical Draft Cooling Tower | TS in 2023 | Release Point Apportionment: SV0027 (SV-COOLINGTWRA), CF0001 (CDPTWRA): 100.0% |
| Additional Information: Previous AQDID: 38500101 | | | | | |
| EU0012 (EUCOOLTWRB) | FR0001 | 38500101 | Mechanical Draft Cooling Tower | TS in 2023 | Release Point Apportionment: SV0028 (SV-COOLINGTWRB), CF0002 (CDPTWRB): 100.0% |
| Additional Information: Previous AQDID: 38500101 | | | | | |
| EU0013 (EUEVAFBOILER) | FR0001 | 10200501 | Evaporation Heating Boiler | OP | Release Point Apportionment: SV0001 (SVEVAFHTBLR), Not Controlled: 100.0% |
| Additional Information: Previous AQDID: 10200501 | | | | | |
| EU0015 (EUGEN1) | FR0001 | 20200401 | Emergency Generator #1. 3500 Brakehorse power (BHP) | OP | Release Point Apportionment: SV0003 (SVGEN1), Not Controlled: 100.0% |
| Additional Information: Previous AQDID: 20200401 | | | | | |
| EU0016 (EUGEN2) | FR0001 | 20200401 | Emergency Generator #2. 3500 Brakehorse power (BHP) | OP | Release Point Apportionment: SV0004 (SVGEN2), Not Controlled: 100.0% |
| Additional Information: Previous AQDID: 20200401 | | | | | |
| EU0024 (EUGEN3) | FR0001 | 20200401 | Emergency Generator 3 | OP | Release Point Apportionment: SV0023 (SVGEN3), Not Controlled: 100.0% |
| Additional Information: Previous AQDID: 20200401 | | | | | |
| EU0028 (EUGENK-10) | FR0001 | 20200102 | Emergency fire pump | OP | Release Point Apportionment: FUG001 (FUGITIVE), Not Controlled: 100.0% |
| Additional Information: Previous AQDID: 20200102 | | | | | |
| EU0032 (EUGENK-17) | FR0001 | 20200401 | Emergency Generator for auxiliary feedwater system pump. 800 BHP | TS in 2023 | Release Point Apportionment: SV0026 (SVGENK-17), Not Controlled: 100.0% |
| Additional Information: Previous AQDID: 20200401 | | | | | |
| EU0029 (EUGENK-1A) | FR0002 | 20201702 | Gasoline fired air compressor | OP | Release Point Apportionment: FUG001 (FUGITIVE), Not Controlled: 100.0% |
| Additional Information: Previous AQDID: 20201702 | | | | | |

| Emission Unit ID | Unit Process ID | SCC | Description | Status | Details |
|--------------------------------------------------------|-----------------|----------|-------------------------------|--------|--------------------------------------------------------------------------------------|
| EJ0030 (EUGENK-1B) | FR0002 | 20201702 | Gasoline fired air compressor | OP | Release Point Apportionment: FUG001 (FUGITIVE), Not Controlled: 100.0% |
| Additional Information: Previous AQID: 20201702 | | | | | |
| EJ0027 (EUGENK-5) | FR0001 | 20200102 | Emergency fire pump | OP | Release Point Apportionment: FUG001 (FUGITIVE), Not Controlled: 100.0% |
| Additional Information: Previous AQID: 20200102 | | | | | |
| EJ0026 (EUOFFICEBLR) | FR0001 | 10200501 | Office heating boiler | OP | Release Point Apportionment: FUG001 (FUGITIVE), Not Controlled: 100.0% |
| Additional Information: Previous AQID: 10200501 | | | | | |
| EJ0018 (EUPLANTHEATBLR) | FR0001 | 10200501 | Plant heating boiler | OP | Release Point Apportionment: SV0006 (SVPLNTH-TBLR), Not Controlled: 100.0% |
| Additional Information: Previous AQID: 10200501 | | | | | |

| PROCESS EMISSIONS | | | | | | |
|--------------------------|------------------------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|-------------------------|------------------------------------------|-------------------------------|
| Emission Unit ID | Unit Process ID | Throughput | Operations | | | |
| EU0025 (EJ-SECURITY GEN) | FR0001 Emergency Generator (762 BHP) for security operations. | Annual Throughput: 0.598 1000 GALLONS (Diesel) (Input) | Average Hours/Day: 1.0, Days/Week: 1.0, Weeks/Year: | | | |
| | | Supplemental Calculation Parameters % Sulfur: 0.001 | Actual Days/Year: 10.0 Actual Hours/Year: 14.0 Seasonal Operations: Dec-Feb: 9.0%, Mar-May: 45.0%, Jun-Aug: 37.0%, Sep-Nov: 9.0% | | | |
| | | Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) |
| | | CO - Carbon Monoxide | 116.0 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.03468399999999 |
| | | Overall Control Efficiency: 0.0% | | | | |
| | | Ozone Season Emissions (Tons): 0.0190761999999995 | | | | |
| | | NOX - Nitrogen Oxides | 438.0 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.130961999999999 |
| | | Overall Control Efficiency: 0.0% | | | | |
| | | Ozone Season Emissions (Tons): 0.0720290999999994 | | | | |
| | | PM10-PRI - PM10 Primary (Filt + Cond) | 7.85 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.002347149999999 |
| | | Overall Control Efficiency: 0.0% | | | | |
| | | PM10-FIL - PM10 Filterable | 6.8 | E3GAL - 1000 GALLONS | 28 - USEPA EF (pre-control) | 0.002033199999999 |
| | | Overall Control Efficiency: 0.0% | | | | |
| | | Emission Comment: Emission Factor from EPA's WebFire | | | | |
| | | PM25-PRI - PM2.5 Primary (Filt + Cond) | 7.55 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.002257449999999 |
| | | Overall Control Efficiency: 0.0% | | | | |
| | | PM25-FIL - PM2.5 Filterable | 6.5 | E3GAL - 1000 GALLONS | 28 - USEPA EF (pre-control) | 0.001943499999999 |
| | | Overall Control Efficiency: 0.0% | | | | |
| | | Emission Comment: Emission Factor from EPA's WebFire | | | | |
| | | PM-CON - PM Condensable | 1.05 | E3GAL - 1000 GALLONS | 28 - USEPA EF (pre-control) | 0.00031395 |
| | | Overall Control Efficiency: 0.0% | | | | |
| | | Emission Comment: Emission Factor from EPA's WebFire | | | | |
| | | SO2 - Sulfur Dioxide | 0.138 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000041261999999 |
| | | Overall Control Efficiency: 0.0% | | | | |
| | | VOC - Volatile Organic Compounds | 13.7 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.004096299999999 |
| | | Overall Control Efficiency: 0.0% | | | | |
| | | Ozone Season Emissions (Tons): 0.00225296499999945 | | | | |
| | | CH4 - Methane | 1.11 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000331889999999 |
| | | Overall Control Efficiency: 0.0% | | | | |
| | | CO2 - Carbon Dioxide | 22,600.0 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 6.7574 |
| | | Overall Control Efficiency: 0.0% | | | | |

| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) |
|-----------------------------------------|------------------------|----------------------|------------------------------------------|------------------------|
| 107028 - Acrolein | 0.00108 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000322919999 |
| Overall Control Efficiency: 0.0% | | | | |
| 108883 - Toluene | 0.0385 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000011511499999 |
| Overall Control Efficiency: 0.0% | | | | |
| 120127 - Anthracene | 0.0001685 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000503815 |
| Overall Control Efficiency: 0.0% | | | | |
| 129000 - Pyrene | 0.0005083 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0000001519817 |
| Overall Control Efficiency: 0.0% | | | | |
| 130498292 - PAH, total | 0.02904 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000868296 |
| Overall Control Efficiency: 0.0% | | | | |
| 1330207 - Xylenes (Mixed Isomers) | 0.02644 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000007905559999 |
| Overall Control Efficiency: 0.0% | | | | |
| 191242 - Benzo[g,h,i,j]Perylene | 0.00007617 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000022774829 |
| Overall Control Efficiency: 0.0% | | | | |
| 193395 - Indeno[1,2,3-c,d]Pyrene | 0.00005672 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000016959279 |
| Overall Control Efficiency: 0.0% | | | | |
| 205992 - Benzo[b]Fluoranthene | 0.0001521 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000045477899 |
| Overall Control Efficiency: 0.0% | | | | |
| 206440 - Fluoranthene | 0.0005521 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000165077899 |
| Overall Control Efficiency: 0.0% | | | | |
| 207089 - Benzo[k]Fluoranthene | 0.00002987 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000000893113 |
| Overall Control Efficiency: 0.0% | | | | |
| 208968 - Acenaphthylene | 0.001265 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000378234999 |
| Overall Control Efficiency: 0.0% | | | | |
| 218019 - Chrysene | 0.0002096 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000062670399 |
| Overall Control Efficiency: 0.0% | | | | |
| 50000 - Formaldehyde | 0.01081 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000003232189999 |
| Overall Control Efficiency: 0.0% | | | | |
| 50328 - Benzo[a]Pyrene | 0.00003521 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000010527789 |
| Overall Control Efficiency: 0.0% | | | | |
| 53703 - Dibenzo(a,h)Anthracene | 0.0000474 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000014172599 |
| Overall Control Efficiency: 0.0% | | | | |
| 56553 - Benz[a]Anthracene | 0.00008521 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000002547779 |
| Overall Control Efficiency: 0.0% | | | | |

| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) |
|-----------------------------------------|------------------------|----------------------|------------------------------------------|------------------------|
| 71432 - Benzene | 0.1063 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000031783699999 |
| Overall Control Efficiency: 0.0% | | | | |
| 75070 - Acetaldehyde | 0.003452 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000001032148 |
| Overall Control Efficiency: 0.0% | | | | |
| 83329 - Acenaphthene | 0.0006412 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000191718799 |
| Overall Control Efficiency: 0.0% | | | | |
| 85018 - Phenanthrene | 0.00559 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000167141 |
| Overall Control Efficiency: 0.0% | | | | |
| 86737 - Fluorene | 0.001754 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000524445999 |
| Overall Control Efficiency: 0.0% | | | | |
| 91203 - Naphthalene | 0.01781 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000005325189999 |
| Overall Control Efficiency: 0.0% | | | | |

| Emission Unit ID | Unit Process ID | Throughput | Operations | | |
|-----------------------------------------|------------------------|------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--|
| EU0017 (EUCOLDCLEANER) | FR0002 Cold Cleaner | Annual Throughput: 0.0 TONS (Solvents: All) (Input) | Average Hours/Day: 0.0, Days/Week: 0.0, Weeks/Year: 0.0 Actual Days/Year: 0.0 Actual Hours/Year: 0.0 Seasonal Operations: Dec-Feb: 0.0%, Mar-May: 0.0%, Jun-Aug: 0.0%, Sep-Nov: 0.0% | | |
| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) | |
| VOC - Volatile Organic Compounds | 2,000.0 | TON - TONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0 | |
| Overall Control Efficiency: 0.0% | | | | | |

| Emission Unit ID | Unit Process ID | Throughput | Operations | | |
|--------------------------------------------------------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--|
| EU0013 (EUEV/AFBOILER) | FR0001 Evaporation Heating Boiler | Annual Throughput: 12.489 1000 GALLONS (Distillate Oil) (Input) Supplemental Calculation Parameters % Sulfur: 0.0009 | Average Hours/Day: 19.5, Days/Week: 4.0, Weeks/Year: Actual Days/Year: 16.0 Actual Hours/Year: 312.0 Seasonal Operations: Dec-Feb: 0.0%, Mar-May: 68.0%, Jun-Aug: 0.0%, Sep-Nov: 32.0% | | |
| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) | |
| CO - Carbon Monoxide | 5.0 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0312225 | |
| Overall Control Efficiency: 0.0% | | | | | |
| Ozone Season Emissions (Tons): 0.01040749895925 | | | | | |
| 7439921 - Lead | 0.00126 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000786807 | |
| Overall Control Efficiency: 0.0% | | | | | |
| NOX - Nitrogen Oxides | 24.0 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.149868 | |
| Overall Control Efficiency: 0.0% | | | | | |
| Ozone Season Emissions (Tons): 0.0499559950044 | | | | | |

| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) |
|------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------|------------------------------------------|------------------------|
| PM10-PR - PM10 Primary (Filt + Cond) | 2.3 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.014362349999999 |
| Overall Control Efficiency: 0.0% | | | | |
| PM10-FL - PM10 Filterable | 1.0 | E3GAL - 1000 GALLONS | 28 - USEPA EF (pre-control) | 0.0062445 |
| Overall Control Efficiency: 0.0% | | | | |
| Emission Comment: Emission Factor from EPA's WebFire | | | | |
| PM25-PR - PM2.5 Primary (Filt + Cond) | 1.55 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.009678975 |
| Overall Control Efficiency: 0.0% | | | | |
| PM25-FL - PM2.5 Filterable | 0.25 | E3GAL - 1000 GALLONS | 28 - USEPA EF (pre-control) | 0.001561125 |
| Overall Control Efficiency: 0.0% | | | | |
| Emission Comment: Emission Factor from EPA's WebFire | | | | |
| PM-CON - PMCondensable | 1.3 | E3GAL - 1000 GALLONS | 28 - USEPA EF (pre-control) | 0.00811785 |
| Overall Control Efficiency: 0.0% | | | | |
| Emission Comment: Emission Factor from EPA's WebFire | | | | |
| SO2 - Sulfur Dioxide | 0.1278 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0007980471 |
| Overall Control Efficiency: 0.0% | | | | |
| VOC - Volatile Organic Compounds | 0.2 | E3GAL - 1000 GALLONS | 29 - S/L/T EF (pre-control) | 0.0012489 |
| Overall Control Efficiency: 0.0% | | | | |
| Ozone Season Emissions (Tons): 0.00041629995837 | | | | |
| Emission Comment: Utilized same EF. as for TMNOC (29-RF S/L/T Reference EF (pre-control) since no other E.F.s were provided | | | | |
| TMNOC - TMNOC | 0.2 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0012489 |
| Overall Control Efficiency: 0.0% | | | | |
| NH3 - Ammonia | 0.8 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0049956 |
| Overall Control Efficiency: 0.0% | | | | |
| CH4 - Methane | 0.052 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000324713999999 |
| Overall Control Efficiency: 0.0% | | | | |
| N2O - Nitrous Oxide | 0.11 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000686895 |
| Overall Control Efficiency: 0.0% | | | | |
| Emission Comment: Pollutant and meta-data defaulted from Emission Factor reference source. | | | | |
| 50000 - Formaldehyde | 0.048 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000299735999999 |
| Overall Control Efficiency: 0.0% | | | | |
| 50328 - Benzo[a]Pyrene | 0.00000134 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0000000836763 |
| Overall Control Efficiency: 0.0% | | | | |
| 7439965 - Manganese | 0.00084 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000524538 |
| Overall Control Efficiency: 0.0% | | | | |

| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) |
|---------------------------------------------------------------------------------------------------|------------------------|----------------------|------------------------------------------|------------------------|
| 7439976 - Mercury | 0.00042 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000262269 |
| Overall Control Efficiency: 0.0% | | | | |
| 7440020 - Nickel | 0.00042 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000262269 |
| Overall Control Efficiency: 0.0% | | | | |
| 7440382 - Arsenic | 0.00056 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000003496919999 |
| Overall Control Efficiency: 0.0% | | | | |
| 7440417 - Beryllium | 0.00042 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000262269 |
| Overall Control Efficiency: 0.0% | | | | |
| 7440439 - Cadmium | 0.00042 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000262269 |
| Overall Control Efficiency: 0.0% | | | | |
| 7440473 - Chromium | 0.00042 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000262269 |
| Overall Control Efficiency: 0.0% | | | | |
| Emission Comment: Pollutant and meta-data defaulted from Emission Factor reference source. | | | | |
| 7782492 - Selenium | 0.0021 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00001311345 |
| Overall Control Efficiency: 0.0% | | | | |

| Emission Unit ID | Unit Process ID | Throughput | Operations |
|------------------|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EU0015 (EUGEN1) | FR0001 Emergency Generator #1. 3500 Brakehorse power (BHP) | Annual Throughput: 0.216 1000 GALLONS (Diesel) (Input) Supplemental Calculation Parameters % Sulfur: 0.0009 | Average Hours/Day: 0.8, Days/Week: 1.0, Weeks/Year: 2.0 Actual Days/Year: 2.0 Actual Hours/Year: 1.6 Seasonal Operations: Dec-Feb: 0.0%, Mar-May: 62.0%, Jun-Aug: 38.0%, Sep-Nov: 0.0% |

| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) |
|-------------------------------------------------------------|------------------------|----------------------|------------------------------------------|------------------------|
| CO - Carbon Monoxide | 116.0 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.012528 |
| Overall Control Efficiency: 0.0% | | | | |
| Ozone Season Emissions (Tons): 0.0073497604176 | | | | |
| NOX - Nitrogen Oxides | 438.0 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.047303999999999 |
| Overall Control Efficiency: 0.0% | | | | |
| Ozone Season Emissions (Tons): 0.0277516815767994 | | | | |
| FM10-FRI - FM10 Primary (Filt + Cond) | 7.85 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0008478 |
| Overall Control Efficiency: 0.0% | | | | |
| FM10-FIL - FM10 Filterable | 6.8 | E3GAL - 1000 GALLONS | 28 - USEPA EF (pre-control) | 0.000734399999999 |
| Overall Control Efficiency: 0.0% | | | | |
| Emission Comment: Emission Factor from EPA's WebFire | | | | |
| FM25-FRI - FM2.5 Primary (Filt + Cond) | 7.55 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000815399999999 |
| Overall Control Efficiency: 0.0% | | | | |

| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) |
|-------------------------------------------------------------|------------------------|----------------------|------------------------------------------|------------------------|
| FM25-FIL - FM2.5 Filterable | 6.5 | E3GAL - 1000 GALLONS | 28 - USEPA EF (pre-control) | 0.000701999999999 |
| Overall Control Efficiency: 0.0% | | | | |
| Emission Comment: Emission Factor from EPA's WebFire | | | | |
| FM-CON - FM Condensable | 1.05 | E3GAL - 1000 GALLONS | 28 - USEPA EF (pre-control) | 0.0001134 |
| Overall Control Efficiency: 0.0% | | | | |
| Emission Comment: Emission Factor from EPA's WebFire | | | | |
| SO2 - Sulfur Dioxide | 0.1242 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0000134136 |
| Overall Control Efficiency: 0.0% | | | | |
| VOC - Volatile Organic Compounds | 13.7 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.001479599999999 |
| Overall Control Efficiency: 0.0% | | | | |
| Ozone Season Emissions (Tons): 0.000868032049319413 | | | | |
| CH4 - Methane | 1.11 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00011988 |
| Overall Control Efficiency: 0.0% | | | | |
| CO2 - Carbon Dioxide | 22,600.0 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 2.4408 |
| Overall Control Efficiency: 0.0% | | | | |
| 107028 - Acrolein | 0.00108 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000116639999 |
| Overall Control Efficiency: 0.0% | | | | |
| 108883 - Toluene | 0.0385 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000004157999999 |
| Overall Control Efficiency: 0.0% | | | | |
| 120127 - Anthracene | 0.0001685 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000018198 |
| Overall Control Efficiency: 0.0% | | | | |
| 129000 - Pyrene | 0.0005083 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0000000548964 |
| Overall Control Efficiency: 0.0% | | | | |
| 130498292 - PAH, total | 0.02904 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000003136319999 |
| Overall Control Efficiency: 0.0% | | | | |
| 1330207 - Xylenes (Mixed Isomers) | 0.02644 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000285552 |
| Overall Control Efficiency: 0.0% | | | | |
| 191242 - Benzo[g,h,i]Perylene | 0.00007617 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000000822636 |
| Overall Control Efficiency: 0.0% | | | | |
| 193395 - Indeno[1,2,3-c,d]Pyrene | 0.00005672 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000006125759 |
| Overall Control Efficiency: 0.0% | | | | |
| 205992 - Benzo[b]Fluoranthene | 0.0001521 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0000000164268 |
| Overall Control Efficiency: 0.0% | | | | |
| 206440 - Fluoranthene | 0.0005521 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000059626799 |

| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) |
|-----------------------------------------|------------------------|----------------------|------------------------------------------|------------------------|
| Overall Control Efficiency: 0.0% | | | | |
| 207089 - Benzo[k]Fluoranthene | 0.00002987 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000003225959 |
| Overall Control Efficiency: 0.0% | | | | |
| 208968 - Acenaphthylene | 0.001265 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000013662 |
| Overall Control Efficiency: 0.0% | | | | |
| 218019 - Chrysene | 0.0002096 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000022636799 |
| Overall Control Efficiency: 0.0% | | | | |
| 50000 - Formaldehyde | 0.01081 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000116748 |
| Overall Control Efficiency: 0.0% | | | | |
| 50328 - Benzo[a]Pyrene | 0.00003521 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000003802679 |
| Overall Control Efficiency: 0.0% | | | | |
| 53703 - Dibenzo(a,h)Anthracene | 0.0000474 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0000000051192 |
| Overall Control Efficiency: 0.0% | | | | |
| 56553 - Benz[a]Anthracene | 0.00008521 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000000920268 |
| Overall Control Efficiency: 0.0% | | | | |
| 71432 - Benzene | 0.1063 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000011480399999 |
| Overall Control Efficiency: 0.0% | | | | |
| 75070 - Acetaldehyde | 0.003452 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000372816 |
| Overall Control Efficiency: 0.0% | | | | |
| 83329 - Acenaphthene | 0.0006412 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0000000692496 |
| Overall Control Efficiency: 0.0% | | | | |
| 85018 - Phenanthrene | 0.00559 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000060372 |
| Overall Control Efficiency: 0.0% | | | | |
| 86737 - Fluorene | 0.001754 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000189431999 |
| Overall Control Efficiency: 0.0% | | | | |
| 91203 - Naphthalene | 0.01781 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000192348 |
| Overall Control Efficiency: 0.0% | | | | |

| Emission Unit ID | Unit Process ID | Throughput | Operations |
|------------------|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EJ0016 (EUGEN2) | PR0001 Emergency Generator #2. 3500 Brakehorse power (BHP) | Annual Throughput: 0.216 1000 GALLONS (Diesel) (Input) Supplemental Calculation Parameters % Sulfur: 0.0009 | Average Hours/Day: 0.8, Days/Week: 1.0, Weeks/Year: 2.0 Actual Days/Year: 2.0 Actual Hours/Year: 1.6 Seasonal Operations: Dec-Feb: 0.0%, Mar-May: 56.0%, Jun-Aug: 44.0%, Sep-Nov: 0.0% |

| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) |
|----------------------|------------------------|----------------------|------------------------------------------|------------------------|
| CO - Carbon Monoxide | 116.0 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.012528 |

| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) |
|----------------------------------------|-------------------------------------------------------------|----------------------|------------------------------------------|------------------------|
| | Overall Control Efficiency: 0.0% | | | |
| | Ozone Season Emissions (Tons): 0.0078508804176 | | | |
| NOX - Nitrogen Oxides | 438.0 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.04730399999999 |
| | Overall Control Efficiency: 0.0% | | | |
| | Ozone Season Emissions (Tons): 0.0296438415767994 | | | |
| PM10-PRI - PM10 Primary (Filt + Cond) | 7.85 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0008478 |
| | Overall Control Efficiency: 0.0% | | | |
| PM10-FIL - PM10 Filterable | 6.8 | E3GAL - 1000 GALLONS | 28 - USEPA EF (pre-control) | 0.0007343999999999 |
| | Overall Control Efficiency: 0.0% | | | |
| | Emission Comment: Emission Factor from EPA's WebFire | | | |
| PM25-PRI - PM2.5 Primary (Filt + Cond) | 7.55 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0008153999999999 |
| | Overall Control Efficiency: 0.0% | | | |
| PM25-FIL - PM2.5 Filterable | 6.5 | E3GAL - 1000 GALLONS | 28 - USEPA EF (pre-control) | 0.0007019999999999 |
| | Overall Control Efficiency: 0.0% | | | |
| | Emission Comment: Emission Factor from EPA's WebFire | | | |
| PM-CON - PM Condensable | 1.05 | E3GAL - 1000 GALLONS | 28 - USEPA EF (pre-control) | 0.0001134 |
| | Overall Control Efficiency: 0.0% | | | |
| | Emission Comment: Emission Factor from EPA's WebFire | | | |
| SO2 - Sulfur Dioxide | 0.1242 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0000134136 |
| | Overall Control Efficiency: 0.0% | | | |
| VOC - Volatile Organic Compounds | 13.7 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0014795999999999 |
| | Overall Control Efficiency: 0.0% | | | |
| | Ozone Season Emissions (Tons): 0.000927216049319373 | | | |
| CH4 - Methane | 1.11 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00011988 |
| | Overall Control Efficiency: 0.0% | | | |
| CO2 - Carbon Dioxide | 22,600.0 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 2.4408 |
| | Overall Control Efficiency: 0.0% | | | |
| 107028 - Acrolein | 0.00108 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0000001166399999 |
| | Overall Control Efficiency: 0.0% | | | |
| 108883 - Toluene | 0.0385 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0000041579999999 |
| | Overall Control Efficiency: 0.0% | | | |
| 120127 - Anthracene | 0.0001685 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000018198 |
| | Overall Control Efficiency: 0.0% | | | |
| 129000 - Pyrene | 0.0005083 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0000000548964 |

| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) |
|-----------------------------------|-----------------------------------------|----------------------|------------------------------------------|------------------------|
| | Overall Control Efficiency: 0.0% | | | |
| 130498292 - PAH, total | 0.02904 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000003136319999 |
| | Overall Control Efficiency: 0.0% | | | |
| 1330207 - Xylenes (Mixed Isomers) | 0.02644 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000285552 |
| | Overall Control Efficiency: 0.0% | | | |
| 191242 - Benzo[g,h,i]Perylene | 0.00007617 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0000000822636 |
| | Overall Control Efficiency: 0.0% | | | |
| 193395 - Indeno[1,2,3-c,d]Pyrene | 0.00005672 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000006125759 |
| | Overall Control Efficiency: 0.0% | | | |
| 205992 - Benzo[b]Fluoranthene | 0.0001521 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0000000164268 |
| | Overall Control Efficiency: 0.0% | | | |
| 206440 - Fluoranthene | 0.0005521 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000059626799 |
| | Overall Control Efficiency: 0.0% | | | |
| 207089 - Benzo[k]Fluoranthene | 0.00002987 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000003225959 |
| | Overall Control Efficiency: 0.0% | | | |
| 208968 - Acenaphthylene | 0.001265 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000013662 |
| | Overall Control Efficiency: 0.0% | | | |
| 218019 - Chrysene | 0.0002096 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000022636799 |
| | Overall Control Efficiency: 0.0% | | | |
| 50000 - Formaldehyde | 0.01081 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000116748 |
| | Overall Control Efficiency: 0.0% | | | |
| 50328 - Benzo[a]Pyrene | 0.00003521 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000003802679 |
| | Overall Control Efficiency: 0.0% | | | |
| 53703 - Dibenzo(a,h)Anthracene | 0.0000474 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0000000051192 |
| | Overall Control Efficiency: 0.0% | | | |
| 56553 - Benz[a]Anthracene | 0.00008521 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000000920268 |
| | Overall Control Efficiency: 0.0% | | | |
| 71432 - Benzene | 0.1063 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000011480399999 |
| | Overall Control Efficiency: 0.0% | | | |
| 75070 - Acetaldehyde | 0.003452 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000372816 |
| | Overall Control Efficiency: 0.0% | | | |
| 83329 - Acenaphthene | 0.0006412 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0000000692496 |
| | Overall Control Efficiency: 0.0% | | | |
| 85018 - Phenanthrene | 0.00559 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000060372 |

| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) |
|-----------------------------------------|------------------------|----------------------|------------------------------------------|------------------------|
| Overall Control Efficiency: 0.0% | | | | |
| 86737 - Fluorene | 0.001754 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000189431999 |
| Overall Control Efficiency: 0.0% | | | | |
| 91203 - Naphthalene | 0.01781 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000192348 |
| Overall Control Efficiency: 0.0% | | | | |

| Emission Unit ID | Unit Process ID | Throughput | Operations |
|------------------|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EU0024 (EUGEN3) | FR0001 Emergency Generator 3 | Annual Throughput: 0.123 1000 GALLONS (Diesel) (Input) Supplemental Calculation Parameters % Sulfur: 0.0011 | Average Hours/Day: 1.0, Days/Week: 1.0, Weeks/Year: 1.0 Actual Days/Year: 1.0 Actual Hours/Year: 1.0 Seasonal Operations: Dec-Feb: 0.0%, Mar-May: 0.0%, Jun-Aug: 100.0%, Sep-Nov: 0.0% |

| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) |
|-------------------------------------------------------------|------------------------|----------------------|------------------------------------------|------------------------|
| CO - Carbon Monoxide | 116.0 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.007134 |
| Overall Control Efficiency: 0.0% | | | | |
| Ozone Season Emissions (Tons): 0.007134 | | | | |
| NOX - Nitrogen Oxides | 416.6 | E3GAL - 1000 GALLONS | 13 - Other EF (post-control) | 0.0256209 |
| Ozone Season Emissions (Tons): 0.0256209 | | | | |
| FM10-PRI - FM10 Primary (Filt + Cond) | 7.85 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000482774999999 |
| Overall Control Efficiency: 0.0% | | | | |
| FM10-FIL - FM10 Filterable | 6.8 | E3GAL - 1000 GALLONS | 28 - USEPA EF (pre-control) | 0.000418199999999 |
| Overall Control Efficiency: 0.0% | | | | |
| Emission Comment: Emission Factor from EPA's WebFire | | | | |
| FM25-PRI - FM2.5 Primary (Filt + Cond) | 7.55 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000464324999999 |
| Overall Control Efficiency: 0.0% | | | | |
| FM25-FIL - FM2.5 Filterable | 6.5 | E3GAL - 1000 GALLONS | 28 - USEPA EF (pre-control) | 0.000399749999999 |
| Overall Control Efficiency: 0.0% | | | | |
| Emission Comment: Emission Factor from EPA's WebFire | | | | |
| FM-CON - FM Condensable | 1.05 | E3GAL - 1000 GALLONS | 28 - USEPA EF (pre-control) | 0.000064575 |
| Overall Control Efficiency: 0.0% | | | | |
| Emission Comment: Emission Factor from EPA's WebFire | | | | |
| SO2 - Sulfur Dioxide | 0.1518 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000009335699999 |
| Overall Control Efficiency: 0.0% | | | | |
| VOC - Volatile Organic Compounds | 13.7 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000842549999999 |
| Overall Control Efficiency: 0.0% | | | | |
| Ozone Season Emissions (Tons): 0.000842549999999 | | | | |

| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) |
|-----------------------------------------|------------------------|----------------------|------------------------------------------|------------------------|
| CH4 - Methane | 1.11 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000068265 |
| Overall Control Efficiency: 0.0% | | | | |
| CO2 - Carbon Dioxide | 22,600.0 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 1.3899 |
| Overall Control Efficiency: 0.0% | | | | |
| 107028 - Acrolein | 0.00108 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0000006642 |
| Overall Control Efficiency: 0.0% | | | | |
| 108883 - Toluene | 0.0385 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000002367749999 |
| Overall Control Efficiency: 0.0% | | | | |
| 120127 - Anthracene | 0.0001685 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000010362749 |
| Overall Control Efficiency: 0.0% | | | | |
| 129000 - Pyrene | 0.0005083 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000003126045 |
| Overall Control Efficiency: 0.0% | | | | |
| 130498292 - PAH, total | 0.02904 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000178596 |
| Overall Control Efficiency: 0.0% | | | | |
| 1330207 - Xylenes (Mixed Isomers) | 0.02644 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000162606 |
| Overall Control Efficiency: 0.0% | | | | |
| 191242 - Benzo[g,h,i]Perylene | 0.00007617 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000004684455 |
| Overall Control Efficiency: 0.0% | | | | |
| 193395 - Indeno[1,2,3-c,d]Pyrene | 0.00005672 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000003488279 |
| Overall Control Efficiency: 0.0% | | | | |
| 205992 - Benzo[b]Fluoranthene | 0.0001521 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000000935415 |
| Overall Control Efficiency: 0.0% | | | | |
| 206440 - Fluoranthene | 0.0005521 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000003395415 |
| Overall Control Efficiency: 0.0% | | | | |
| 207089 - Benzo[k]Fluoranthene | 0.00002987 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000001837005 |
| Overall Control Efficiency: 0.0% | | | | |
| 208968 - Acenaphthylene | 0.001265 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0000000777975 |
| Overall Control Efficiency: 0.0% | | | | |
| 218019 - Chrysene | 0.0002096 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0000000128904 |
| Overall Control Efficiency: 0.0% | | | | |
| 50000 - Formaldehyde | 0.01081 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000664815 |
| Overall Control Efficiency: 0.0% | | | | |
| 50328 - Benzo[a]Pyrene | 0.00003521 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000002165414 |
| Overall Control Efficiency: 0.0% | | | | |

| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) |
|-----------------------------------------|------------------------|----------------------|------------------------------------------|------------------------|
| 53703 - Dibenzo(a,h)Anthracene | 0.0000474 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000002915099 |
| Overall Control Efficiency: 0.0% | | | | |
| 56553 - Benz[a]Anthracene | 0.00008521 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000005240415 |
| Overall Control Efficiency: 0.0% | | | | |
| 71432 - Benzene | 0.1063 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000653745 |
| Overall Control Efficiency: 0.0% | | | | |
| 75070 - Acetaldehyde | 0.003452 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000212298 |
| Overall Control Efficiency: 0.0% | | | | |
| 83329 - Acenaphthene | 0.0006412 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000039433799 |
| Overall Control Efficiency: 0.0% | | | | |
| 85018 - Phenanthrene | 0.00559 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000343785 |
| Overall Control Efficiency: 0.0% | | | | |
| 86737 - Fluorene | 0.001754 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000107871 |
| Overall Control Efficiency: 0.0% | | | | |
| 91203 - Naphthalene | 0.01781 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000001095314999 |
| Overall Control Efficiency: 0.0% | | | | |

| Emission Unit ID | Unit Process ID | Throughput | Operations |
|--------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EJ0028 (EUGENK-10) | FR0001 Emergency fire pump | Annual Throughput: 0.053 1000 GALLONS (Diesel) (Input) Supplemental Calculation Parameters % Sulfur: 0.0009 | Average Hours/Day: 0.7, Days/Week: 1.0, Weeks/Year: Actual Days/Year: 6.0 Actual Hours/Year: 4.4 Seasonal Operations: Dec-Feb: 11.0%, Mar-May: 43.0%, Jun-Aug: 12.0%, Sep-Nov: 34.0% |

| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) |
|-----------------------------------------------------------|------------------------|----------------------|------------------------------------------|------------------------|
| CO - Carbon Monoxide | 130.0 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00344499999999 |
| Overall Control Efficiency: 0.0% | | | | |
| Ozone Season Emissions (Tons): 0.00129761678149962 | | | | |
| NOX - Nitrogen Oxides | 604.0 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.01600599999999 |
| Overall Control Efficiency: 0.0% | | | | |
| Ozone Season Emissions (Tons): 0.00602892720019962 | | | | |
| FM10-FRI - FM10 Primary (Filt + Cond) | 46.9 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00124284999999 |
| Overall Control Efficiency: 0.0% | | | | |
| FM10-FIL - FM10 Filterable | 42.5 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00112625 |
| Overall Control Efficiency: 0.0% | | | | |
| FM25-FRI - FM2.5 Primary (Filt + Cond) | 46.9 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00124284999999 |
| Overall Control Efficiency: 0.0% | | | | |

| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) |
|------------------------------------------------------------|------------------------|----------------------|------------------------------------------|------------------------|
| FM25-FIL - FM2.5 Filterable | 42.5 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00112625 |
| Overall Control Efficiency: 0.0% | | | | |
| SO2 - Sulfur Dioxide | 39.7 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00105205 |
| Overall Control Efficiency: 0.0% | | | | |
| VOC - Volatile Organic Compounds | 49.3 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.001306449999999 |
| Overall Control Efficiency: 0.0% | | | | |
| Ozone Season Emissions (Tons): 0.000492096210214623 | | | | |
| TOG - TOTAL ORGANIC GAS | 49.3 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.001306449999999 |
| Overall Control Efficiency: 0.0% | | | | |
| CO2 - Carbon Dioxide | 22,600.0 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.598899999999999 |
| Overall Control Efficiency: 0.0% | | | | |
| 106990 - 1,3-Butadiene | 0.005357 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000141960499 |
| Overall Control Efficiency: 0.0% | | | | |
| 107028 - Acrolein | 0.01267 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000335755 |
| Overall Control Efficiency: 0.0% | | | | |
| 108883 - Toluene | 0.05603 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000001484795 |
| Overall Control Efficiency: 0.0% | | | | |
| 120127 - Anthracene | 0.0002562 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000006789299 |
| Overall Control Efficiency: 0.0% | | | | |
| 129000 - Pyrene | 0.0006549 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000001735485 |
| Overall Control Efficiency: 0.0% | | | | |
| 130498292 - PAH, total | 0.02302 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000610029999 |
| Overall Control Efficiency: 0.0% | | | | |
| 1330207 - Xylenes (Mixed Isomers) | 0.03905 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000001034825 |
| Overall Control Efficiency: 0.0% | | | | |
| 191242 - Benzo[g,h,i,j]Perylene | 0.00006699 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000001775234 |
| Overall Control Efficiency: 0.0% | | | | |
| 193395 - Indeno[1,2,3-c,d]Pyrene | 0.00005138 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000000136157 |
| Overall Control Efficiency: 0.0% | | | | |
| 205992 - Benzo[b]Fluoranthene | 0.00001358 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000000035987 |
| Overall Control Efficiency: 0.0% | | | | |
| 206440 - Fluoranthene | 0.001043 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0000000276395 |
| Overall Control Efficiency: 0.0% | | | | |
| 207089 - Benzo[k]Fluoranthene | 0.00002124 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000000562859 |

| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) |
|-----------------------------------------|------------------------|----------------------|------------------------------------------|------------------------|
| Overall Control Efficiency: 0.0% | | | | |
| 208968 - Acenaphthylene | 0.0006932 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0000000183698 |
| Overall Control Efficiency: 0.0% | | | | |
| 218019 - Chrysene | 0.00004836 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000001281539 |
| Overall Control Efficiency: 0.0% | | | | |
| 50000 - Formaldehyde | 0.1617 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000428505 |
| Overall Control Efficiency: 0.0% | | | | |
| 50328 - Benzo[a]Pyrene | 0.00002576 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000000682639 |
| Overall Control Efficiency: 0.0% | | | | |
| 53703 - Dibenzo(a,h)Anthracene | 0.00007987 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000002116555 |
| Overall Control Efficiency: 0.0% | | | | |
| 56553 - Benz[a]Anthracene | 0.0002302 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000006100299 |
| Overall Control Efficiency: 0.0% | | | | |
| 71432 - Benzene | 0.1278 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000003386699999 |
| Overall Control Efficiency: 0.0% | | | | |
| 7439976 - Mercury | 0.00004129 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000001094184 |
| Overall Control Efficiency: 0.0% | | | | |
| 75070 - Acetaldehyde | 0.1051 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000002785149999 |
| Overall Control Efficiency: 0.0% | | | | |
| 83329 - Acenaphthene | 0.0001448 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000003837199 |
| Overall Control Efficiency: 0.0% | | | | |
| 85018 - Phenanthrene | 0.004028 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000106742 |
| Overall Control Efficiency: 0.0% | | | | |
| 86737 - Fluorene | 0.004 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000105999999 |
| Overall Control Efficiency: 0.0% | | | | |
| 91203 - Naphthalene | 0.01162 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000307929999 |
| Overall Control Efficiency: 0.0% | | | | |

| Emission Unit ID | Unit Process ID | Throughput | Operations |
|--------------------|-----------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EJ0029 (EUGENK-1A) | FR0002 Gasoline fired air compressor | Annual Throughput: 0.0 1000 GALLONS (Gasoline) (Input) | Average Hours/Day: 0.0, Days/Week: 0.0, Weeks/Year: Actual Days/Year: 0.0 Actual Hours/Year: 0.0 Seasonal Operations: Dec-Feb: 0.0%, Mar-May: 0.0%, Jun-Aug: 0.0%, Sep-Nov: 0.0% |

| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) |
|----------------------|------------------------|----------------------|-----------------------------|------------------------|
| CO - Carbon Monoxide | 0.99 | E3GAL - 1000 GALLONS | 8 - USEPA EF (post-control) | 0.0 |

| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) |
|---------------------------------------|------------------------|----------------------|-----------------------------|------------------------|
| NOX - Nitrogen Oxides | 1.63 | E3GAL - 1000 GALLONS | 8 - USEPA EF (post-control) | 0.0 |
| FM10-PRI - FM10 Primary (Filt + Cond) | 0.1 | E3GAL - 1000 GALLONS | 8 - USEPA EF (post-control) | 0.0 |
| SO2 - Sulfur Dioxide | 0.084 | E3GAL - 1000 GALLONS | 8 - USEPA EF (post-control) | 0.0 |
| VOC - Volatile Organic Compounds | 0.07 | E3GAL - 1000 GALLONS | 8 - USEPA EF (post-control) | 0.0 |

| Emission Unit ID | Unit Process ID | Throughput | Operations |
|--------------------|-----------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EU0030 (EUGENK-1B) | FR0002 Gasoline fired air compressor | Annual Throughput: 0.0 1000 GALLONS (Gasoline) (Input) | Average Hours/Day: 0.0, Days/Week: 0.0, Weeks/Year: Actual Days/Year: 0.0 Actual Hours/Year: 0.0 Seasonal Operations: Dec-Feb: 0.0%, Mar-May: 0.0%, Jun-Aug: 0.0%, Sep-Nov: 0.0% |

| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) |
|---------------------------------------|------------------------|----------------------|-----------------------------|------------------------|
| CO - Carbon Monoxide | 0.99 | E3GAL - 1000 GALLONS | 8 - USEPA EF (post-control) | 0.0 |
| NOX - Nitrogen Oxides | 1.63 | E3GAL - 1000 GALLONS | 8 - USEPA EF (post-control) | 0.0 |
| FM10-PRI - FM10 Primary (Filt + Cond) | 0.1 | E3GAL - 1000 GALLONS | 8 - USEPA EF (post-control) | 0.0 |
| SO2 - Sulfur Dioxide | 0.084 | E3GAL - 1000 GALLONS | 8 - USEPA EF (post-control) | 0.0 |
| VOC - Volatile Organic Compounds | 0.07 | E3GAL - 1000 GALLONS | 8 - USEPA EF (post-control) | 0.0 |

| Emission Unit ID | Unit Process ID | Throughput | Operations |
|-------------------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EU0027 (EUGENK-5) | FR0001 Emergency fire pump | Annual Throughput: 0.106 1000 GALLONS (Diesel) (Input) Supplemental Calculation Parameters % Sulfur: 0.0009 | Average Hours/Day: 1.3, Days/Week: 1.0, Weeks/Year: Actual Days/Year: 7.0 Actual Hours/Year: 8.8 Seasonal Operations: Dec-Feb: 47.0%, Mar-May: 32.0%, Jun-Aug: 6.0%, Sep-Nov: 15.0% |

| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) |
|-----------------------------------------------------------|------------------------|----------------------|------------------------------------------|------------------------|
| CO - Carbon Monoxide | 130.0 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.006889999999999 |
| Overall Control Efficiency: 0.0% | | | | |
| Ozone Season Emissions (Tons): 0.00149283356299978 | | | | |
| NOX - Nitrogen Oxides | 604.0 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.032011999999999 |
| Overall Control Efficiency: 0.0% | | | | |
| Ozone Season Emissions (Tons): 0.00693593440039978 | | | | |
| FM10-PRI - FM10 Primary (Filt + Cond) | 46.9 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.002485699999999 |
| Overall Control Efficiency: 0.0% | | | | |
| FM10-FIL - FM10 Filterable | 42.5 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0022525 |
| Overall Control Efficiency: 0.0% | | | | |
| FM25-PRI - FM2.5 Primary (Filt + Cond) | 46.9 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.002485699999999 |
| Overall Control Efficiency: 0.0% | | | | |
| FM25-FIL - FM2.5 Filterable | 42.5 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0022525 |

| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) |
|------------------------------------------------------------|------------------------|----------------------|------------------------------------------|------------------------|
| Overall Control Efficiency: 0.0% | | | | |
| SO2 - Sulfur Dioxide | 39.7 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0021041 |
| Overall Control Efficiency: 0.0% | | | | |
| VOC - Volatile Organic Compounds | 49.3 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.002612899999999 |
| Overall Control Efficiency: 0.0% | | | | |
| Ozone Season Emissions (Tons): 0.000566128420429783 | | | | |
| TOG - TOTAL ORGANIC GAS | 49.3 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.002612899999999 |
| Overall Control Efficiency: 0.0% | | | | |
| CO2 - Carbon Dioxide | 22,600.0 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 1.1978 |
| Overall Control Efficiency: 0.0% | | | | |
| 106990 - 1,3-Butadiene | 0.005357 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000283920999 |
| Overall Control Efficiency: 0.0% | | | | |
| 107028 - Acrolein | 0.01267 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000067151 |
| Overall Control Efficiency: 0.0% | | | | |
| 108883 - Toluene | 0.05603 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000296959 |
| Overall Control Efficiency: 0.0% | | | | |
| 120127 - Anthracene | 0.0002562 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000013578599 |
| Overall Control Efficiency: 0.0% | | | | |
| 129000 - Pyrene | 0.0006549 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0000000347097 |
| Overall Control Efficiency: 0.0% | | | | |
| 130498292 - PAH total | 0.02302 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000001220059999 |
| Overall Control Efficiency: 0.0% | | | | |
| 1330207 - Xylenes (Mixed Isomers) | 0.03905 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000206965 |
| Overall Control Efficiency: 0.0% | | | | |
| 191242 - Benzo[g,h,i]Perylene | 0.00006699 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000003550469 |
| Overall Control Efficiency: 0.0% | | | | |
| 193395 - Indeno[1,2,3-c,d]Pyrene | 0.00005138 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000000272314 |
| Overall Control Efficiency: 0.0% | | | | |
| 205992 - Benzo[b]Fluoranthene | 0.00001358 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000000071974 |
| Overall Control Efficiency: 0.0% | | | | |
| 206440 - Fluoranthene | 0.001043 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000055279 |
| Overall Control Efficiency: 0.0% | | | | |
| 207089 - Benzo[k]Fluoranthene | 0.00002124 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000001125719 |
| Overall Control Efficiency: 0.0% | | | | |

| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) |
|-----------------------------------------|------------------------|----------------------|------------------------------------------|------------------------|
| 208968 - Acenaphthylene | 0.0006932 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0000000367396 |
| Overall Control Efficiency: 0.0% | | | | |
| 218019 - Chrysene | 0.00004836 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000002563079 |
| Overall Control Efficiency: 0.0% | | | | |
| 50000 - Formaldehyde | 0.1617 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0000085701 |
| Overall Control Efficiency: 0.0% | | | | |
| 50328 - Benzo[a]Pyrene | 0.00002576 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000001365279 |
| Overall Control Efficiency: 0.0% | | | | |
| 53703 - Dibenzo(a,h)Anthracene | 0.00007987 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000000423311 |
| Overall Control Efficiency: 0.0% | | | | |
| 56553 - Benz[a]Anthracene | 0.0002302 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000012200599 |
| Overall Control Efficiency: 0.0% | | | | |
| 71432 - Benzene | 0.1278 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000006773399999 |
| Overall Control Efficiency: 0.0% | | | | |
| 7439976 - Mercury | 0.00004129 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000002188369 |
| Overall Control Efficiency: 0.0% | | | | |
| 75070 - Acetaldehyde | 0.1051 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000005570299999 |
| Overall Control Efficiency: 0.0% | | | | |
| 83329 - Acenaphthene | 0.0001448 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000007674399 |
| Overall Control Efficiency: 0.0% | | | | |
| 85018 - Phenanthrene | 0.004028 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000213484 |
| Overall Control Efficiency: 0.0% | | | | |
| 86737 - Fluorene | 0.004 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000211999999 |
| Overall Control Efficiency: 0.0% | | | | |
| 91203 - Naphthalene | 0.01162 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000000615859999 |
| Overall Control Efficiency: 0.0% | | | | |

| Emission Unit ID | Unit Process ID | Throughput | Operations | | | | | | | | | | | | | | | |
|-----------------------------------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|------------------|--------------------|------------------------|----------------------|-----|----------------------|------------------------------------------|---------|-----------------------------------------|--|--|--|--|--|
| EU0026 (EUOFFICEBLR) | PR0001 Office heating boiler | Annual Throughput: 39.984 1000 GALLONS (Distillate Oil) (Input) Supplemental Calculation Parameters % Sulfur: 0.0009 | Average Hours/Day: 20.0, Days/Week: 5.0, Weeks/Year: Actual Days/Year: 142.0 Actual Hours/Year: 2,856.0 Seasonal Operations: Dec-Feb: 51.0%, Mar-May: 32.0%, Jun-Aug: 0.0%, Sep-Nov: 17.0% | | | | | | | | | | | | | | | |
| | | <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Emis. Factor (Lbs/UOM)</th> <th>Emis. Factor UOM</th> <th>Calculation Method</th> <th>Estimated Emis. (Tons)</th> </tr> </thead> <tbody> <tr> <td>CO - Carbon Monoxide</td> <td>5.0</td> <td>E3GAL - 1000 GALLONS</td> <td>29-RF - S/L/T Reference EF (pre-control)</td> <td>0.09996</td> </tr> <tr> <td colspan="5">Overall Control Efficiency: 0.0%</td> </tr> </tbody> </table> | Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) | CO - Carbon Monoxide | 5.0 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.09996 | Overall Control Efficiency: 0.0% | | | | | |
| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) | | | | | | | | | | | | | | |
| CO - Carbon Monoxide | 5.0 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.09996 | | | | | | | | | | | | | | |
| Overall Control Efficiency: 0.0% | | | | | | | | | | | | | | | | | | |

| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) |
|----------------------------------------|-------------------------------------------------------------------------------------------------------|----------------------|------------------------------------------|------------------------|
| | Ozone Season Emissions (Tons): 0.016326796668 | | | |
| 7439921 - Lead | 0.00126 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00002518992 |
| | Overall Control Efficiency: 0.0% | | | |
| NOX - Nitrogen Oxides | 24.0 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.479808 |
| | Overall Control Efficiency: 0.0% | | | |
| | Ozone Season Emissions (Tons): 0.0783686240064 | | | |
| PM10-FRI - PM10 Primary (Filt + Cond) | 2.3 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.045981599999999 |
| | Overall Control Efficiency: 0.0% | | | |
| PM10-FIL - PM10 Filterable | 1.0 | E3GAL - 1000 GALLONS | 28 - USEPA EF (pre-control) | 0.019991999999999 |
| | Overall Control Efficiency: 0.0% | | | |
| | Emission Comment: Emission Factor from EPA's WebFire | | | |
| PM25-FRI - PM2.5 Primary (Filt + Cond) | 1.55 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0309876 |
| | Overall Control Efficiency: 0.0% | | | |
| PM25-FIL - PM2.5 Filterable | 0.25 | E3GAL - 1000 GALLONS | 28 - USEPA EF (pre-control) | 0.004997999999999 |
| | Overall Control Efficiency: 0.0% | | | |
| | Emission Comment: Emission Factor from EPA's WebFire | | | |
| PM-CON - PM Condensable | 1.3 | E3GAL - 1000 GALLONS | 28 - USEPA EF (pre-control) | 0.0259896 |
| | Overall Control Efficiency: 0.0% | | | |
| | Emission Comment: Emission Factor from EPA's WebFire | | | |
| SO2 - Sulfur Dioxide | 0.1278 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0025549776 |
| | Overall Control Efficiency: 0.0% | | | |
| VOC - Volatile Organic Compounds | 0.2 | E3GAL - 1000 GALLONS | 29 - S/L/T EF (pre-control) | 0.0039984 |
| | Overall Control Efficiency: 0.0% | | | |
| | Ozone Season Emissions (Tons): 0.00065307186672 | | | |
| | Emission Comment: Used same emission factor as TNMOC since no VOC emission factor is available | | | |
| TNMOC - TNMOC | 0.2 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0039984 |
| | Overall Control Efficiency: 0.0% | | | |
| NH3 - Ammonia | 0.8 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0159936 |
| | Overall Control Efficiency: 0.0% | | | |
| CH4 - Methane | 0.052 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.001039584 |
| | Overall Control Efficiency: 0.0% | | | |
| N2O - Nitrous Oxide | 0.11 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00219912 |
| | Overall Control Efficiency: 0.0% | | | |
| | Emission Comment: Pollutant and meta-data defaulted from Emission Factor reference source. | | | |

| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) |
|---------------------------------------------------------------------------------------------------|------------------------|----------------------|------------------------------------------|------------------------|
| 50000 - Formaldehyde | 0.048 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000959616 |
| Overall Control Efficiency: 0.0% | | | | |
| 50328 - Benzo[a]Pyrene | 0.00000134 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0000002678928 |
| Overall Control Efficiency: 0.0% | | | | |
| 7439965 - Manganese | 0.00084 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000016793279999 |
| Overall Control Efficiency: 0.0% | | | | |
| 7439976 - Mercury | 0.00042 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000008396639999 |
| Overall Control Efficiency: 0.0% | | | | |
| 7440020 - Nickel | 0.00042 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000008396639999 |
| Overall Control Efficiency: 0.0% | | | | |
| 7440382 - Arsenic | 0.00056 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000011195519999 |
| Overall Control Efficiency: 0.0% | | | | |
| 7440417 - Beryllium | 0.00042 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000008396639999 |
| Overall Control Efficiency: 0.0% | | | | |
| 7440439 - Cadmium | 0.00042 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000008396639999 |
| Overall Control Efficiency: 0.0% | | | | |
| 7440473 - Chromium | 0.00042 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000008396639999 |
| Overall Control Efficiency: 0.0% | | | | |
| Emission Comment: Pollutant and meta-data defaulted from Emission Factor reference source. | | | | |
| 7782492 - Selenium | 0.0021 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0000419832 |
| Overall Control Efficiency: 0.0% | | | | |

| Emission Unit ID | Unit Process ID | Throughput | Operations |
|----------------------------|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EJ0018 (EJPLANTHEATBLR) | FR0001 Plant heating boiler | Annual Throughput: 158.9 1000 GALLONS (Distillate Oil) (Input) Supplemental Calculation Parameters % Sulfur: 0.0009 | Average Hours/Day: 20.0, Days/Week: 5.0, Weeks/Year: Actual Days/Year: 158.0 Actual Hours/Year: 3,178.0 Seasonal Operations: Dec-Feb: 58.0%, Mar-May: 26.0%, Jun-Aug: 0.0%, Sep-Nov: 16.0% |

| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) |
|----------------------------------------------------------|------------------------|----------------------|------------------------------------------|------------------------|
| CO - Carbon Monoxide | 5.0 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.397249999999999 |
| Overall Control Efficiency: 0.0% | | | | |
| Ozone Season Emissions (Tons): 0.0556149999999999 | | | | |
| 7439921 - Lead | 0.00126 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000100106999999 |
| Overall Control Efficiency: 0.0% | | | | |
| NOX - Nitrogen Oxides | 24.0 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 1.9068 |
| Overall Control Efficiency: 0.0% | | | | |

| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) |
|-----------------------------------------------------------------------------------------------------|------------------------|----------------------|------------------------------------------|------------------------|
| Ozone Season Emissions (Tons): 0.266952 | | | | |
| PM10-PRI - PM10 Primary (Filt + Cond) | 2.3 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.182734999999999 |
| Overall Control Efficiency: 0.0% | | | | |
| PM10-FL - PM10 Filterable | 1.0 | E3GAL - 1000 GALLONS | 28 - USEPA EF (pre-control) | 0.07945 |
| Overall Control Efficiency: 0.0% | | | | |
| Emission Comment: Emission Factor from EPA's WebFire | | | | |
| PM25-PRI - PM2.5 Primary (Filt + Cond) | 1.55 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.1231475 |
| Overall Control Efficiency: 0.0% | | | | |
| PM25-FL - PM2.5 Filterable | 0.25 | E3GAL - 1000 GALLONS | 28 - USEPA EF (pre-control) | 0.0198625 |
| Overall Control Efficiency: 0.0% | | | | |
| Emission Comment: Emission Factor from EPA's WebFire | | | | |
| PM-CON - PM Condensable | 1.3 | E3GAL - 1000 GALLONS | 28 - USEPA EF (pre-control) | 0.103285 |
| Overall Control Efficiency: 0.0% | | | | |
| Emission Comment: Emission Factor from EPA's WebFire | | | | |
| SO2 - Sulfur Dioxide | 0.1278 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.010153709999999 |
| Overall Control Efficiency: 0.0% | | | | |
| VOC - Volatile Organic Compounds | 0.2 | E3GAL - 1000 GALLONS | 29 - S/L/T EF (pre-control) | 0.01589 |
| Overall Control Efficiency: 0.0% | | | | |
| Ozone Season Emissions (Tons): 0.0022246 | | | | |
| Emission Comment: Used TNMOC emission factor for VOCs as no other emission factors available | | | | |
| TNMOC - TNMOC | 0.2 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.01589 |
| Overall Control Efficiency: 0.0% | | | | |
| NH3 - Ammonia | 0.8 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.06356 |
| Overall Control Efficiency: 0.0% | | | | |
| CH4 - Methane | 0.052 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.0041314 |
| Overall Control Efficiency: 0.0% | | | | |
| N2O - Nitrous Oxide | 0.11 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.008739499999999 |
| Overall Control Efficiency: 0.0% | | | | |
| Emission Comment: Pollutant and meta-data defaulted from Emission Factor reference source. | | | | |
| 50000 - Formaldehyde | 0.048 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.003813599999999 |
| Overall Control Efficiency: 0.0% | | | | |
| 50328 - Benzo[a]Pyrene | 0.00000134 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.00000106463 |
| Overall Control Efficiency: 0.0% | | | | |
| 7439965 - Manganese | 0.00084 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000066738 |

| Pollutant | Emis. Factor (Lbs/UOM) | Emis. Factor UOM | Calculation Method | Estimated Emis. (Tons) |
|---------------------------------------------------------------------------------------------------|------------------------|----------------------|------------------------------------------|------------------------|
| Overall Control Efficiency: 0.0% | | | | |
| 7439976 - Mercury | 0.00042 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000033369 |
| Overall Control Efficiency: 0.0% | | | | |
| 7440020 - Nickel | 0.00042 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000033369 |
| Overall Control Efficiency: 0.0% | | | | |
| 7440382 - Arsenic | 0.00056 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000044491999999 |
| Overall Control Efficiency: 0.0% | | | | |
| 7440417 - Beryllium | 0.00042 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000033369 |
| Overall Control Efficiency: 0.0% | | | | |
| 7440439 - Cadmium | 0.00042 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000033369 |
| Overall Control Efficiency: 0.0% | | | | |
| 7440473 - Chromium | 0.00042 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000033369 |
| Overall Control Efficiency: 0.0% | | | | |
| Emission Comment: Pollutant and meta-data defaulted from Emission Factor reference source. | | | | |
| 7782492 - Selenium | 0.0021 | E3GAL - 1000 GALLONS | 29-RF - S/L/T Reference EF (pre-control) | 0.000166844999999 |
| Overall Control Efficiency: 0.0% | | | | |

Enclosure 14
HDI PNP 2024-037

Enclosure 14
HDI PNP 2024-037
Response to Request for Additional Information –
RAI-AE-4
Regarding the Proposed Reauthorization of Power Operations of
Palisades Nuclear Plant Under
Renewed Facility Operating License No. DPR-20

NRC RAI Number: RAI-AE-4

Is there any past or current monitoring (or planned monitoring after a return to operations) of the intake and traveling screens for fish or other aquatic organisms? If so, please provide information, if available, on numbers and species entrained. Have there been any fish kills since the PNP entered into decommissioning?

Enclosure 2, "*Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant*," did not provide a description of any monitoring plans to assess the numbers of fish or other aquatic organisms found on the intake or traveling screens and impacts were provided for license renewal (the license renewal impact determinations assumed a baseline of continued operations).

HDI Response to RAI:

No impingement and entrainment studies have been conducted at PNP since post-operational studies. The results of these studies and a listing of species is provided in Section 2.3 of the 2005 LR ER (ML050940449). The draft NPDES permit has intake monitoring requirements. See the current and draft permits for monitoring requirements. The current NPDES permit is available publicly at <https://mienviro.michigan.gov/nsite/map/help/detail/8952571778840478797/documents> and search for Date 09/23/2014 and download the Entergy-Palisades Revised Permit Review.pdf file. The draft permit is provided in Attachment 2. As part of plant activities, intake traveling screens are to be observed during operator rounds. In addition, as scheduled, divers inspect the intake structure annually. The inspection documents physical and environmental conditions. Unless environmental conditions warrant zebra mussel settlement to be addressed, they are left in-situ to allow for natural attenuation. When zebra mussel die-offs occur via measures taken through zebra mussel controls described in the NPDES permit, the deceased individuals are removed during the cleaning of the intake bays. There have been no observed fish kills since PNP entered into decommissioning.

References:

None.

Associated Attachments:

1. State of Michigan, Department of Environment, Great Lakes, and Energy, Draft Permit No. MI0001457.

Enclosure 14
Attachment 1
HDI PNP 2024-037

HDI PNP 2024-037

Enclosure 14

**Attachment 1 - State of Michigan Department of Environment, Great Lakes and Energy,
Draft NPDES Permit No. MI0001457**

48 pages follow

PERMIT NO. MI0001457**AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM**

In compliance with the provisions of the federal Clean Water Act (federal Water Pollution Control Act, 33 U.S.C., Section 1251 *et seq.*, as amended); Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA); Part 41, Sewerage Systems, of the NREPA; and Michigan Executive Order 2019-06,

Holtec Palisades LLC (formerly Entergy Services Inc)

1 Holtec Boulevard
Camden, NJ 08104

is authorized to discharge from the **Holtec Palisades LLC, Palisades Power Plant** located at

27780 Blue Star Memorial Highway
Covert, MI 49043

designated as **Palisades Power Plant**

to the receiving water named Lake Michigan in accordance with effluent limitations, monitoring requirements, and other conditions set forth in this permit.

This permit is based on a complete application submitted on June 11, 2018, as amended through April 3, 2023.

This permit takes effect on DRAFT. The provisions of this permit are severable. After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term in accordance with applicable laws and rules. On its effective date, this permit shall supersede National Pollutant Discharge Elimination System (NPDES) Permit No. MI0001457 (expiring October 1, 2018).

This permit and the authorization to discharge shall expire at midnight on **October 1, 2028**. In order to receive authorization to discharge beyond the date of expiration, the permittee shall submit an application that contains such information, forms, and fees as are required by the Michigan Department of Environment, Great Lakes, and Energy (Department) by **April 4, 2028**.

Issued DRAFT.

Christine Alexander, Manager
Permits Section
Water Resources Division

PERMIT NO. MI0001457**Page 2 of 48**

PERMIT FEE REQUIREMENTS

In accordance with Section 324.3120 of the NREPA, the permittee shall make payment of an annual permit fee to the Department for each October 1 the permit is in effect regardless of occurrence of discharge. The permittee shall submit the fee in response to the Department's annual notice. Payment may be made electronically via the Department's MiEnviro Portal system. The MiEnviro Portal website is located at <https://mienviro.michigan.gov/ncore/>. Payment shall be submitted or postmarked by January 15 for notices mailed by December 1. Payment shall be submitted or postmarked no later than 45 days after receiving the notice for notices mailed after December 1.

Annual Permit Fee Classification: Industrial-Commercial Major

In accordance with Section 324.3118 of the NREPA, the permittee shall make payment of an annual storm water fee to the Department for each January 1 the permit is in effect regardless of occurrence of discharge. The permittee shall submit the fee in response to the Department's annual notice. Payment may be made electronically via the Department's MiEnviro Portal system. The MiEnviro Portal website is located at <https://mienviro.michigan.gov/ncore/>. Payment shall be submitted or postmarked by March 15 for notices mailed by February 1. Payment shall be submitted or postmarked no later than 45 days after receiving the notice for notices mailed after February 1.

CONTACT INFORMATION

Unless specified otherwise, all contact with the Department required by this permit shall be made to the Kalamazoo District Office of the Water Resources Division. The Kalamazoo District Office is located at 7953 Adobe Road, Kalamazoo, MI 49009-5025, Telephone: 269-567-3500, Fax: 269-567-9440.

CONTESTED CASE INFORMATION

Any person who is aggrieved by this permit may file a sworn petition with the Michigan Administrative Hearing System within the Michigan Department of Licensing and Regulatory Affairs, c/o the Michigan Department of Environment, Great Lakes, and Energy, setting forth the conditions of the permit which are being challenged and specifying the grounds for the challenge. The Department of Licensing and Regulatory Affairs may reject any petition filed more than 60 days after issuance as being untimely.

PERMIT NO. MI0001457

Page 3 of 48

PART I**Section A. Limitations and Monitoring Requirements****1. Final Effluent Limitations, Monitoring Point 001A**

During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, the permittee is authorized to discharge a maximum of 135.2 MGD of noncontact cooling water, cooling tower blowdown, and miscellaneous treated low volume wastewater consisting of steam generator blowdown, demineralizer backwash and regeneration waste, reverse osmosis filter backwash, turbine sump drainage, floor drainage, laboratory waste, and radwaste wastewater, and an unspecified amount of storm water from Monitoring Point 001A through Outfall 001. Outfall 001 discharges to Lake Michigan at Latitude 42.32337, Longitude -86.31557. Such discharge shall be limited and monitored by the permittee as specified below.

| Parameter | Maximum Limits for Quantity or Loading | | | Maximum Limits for Quality or Concentration | | | Monitoring Frequency | Sample Type |
|--------------------------------------------------|---------------------------------------------------|--------------|--------------|--------------------------------------------------------|--------------|--------------|---------------------------------|---------------------------------|
| | Monthly | Daily | Units | Monthly | Daily | Units | | |
| Flow | (report) | (report) | MGD | --- | --- | --- | Daily | Report Total Daily Flow |
| Outfall Observation | (report) | --- | --- | --- | --- | --- | 5X Weekly | Visual |
| Temperature | --- | --- | --- | --- | (report) | °F | Daily | Reading |
| Thermal Discharge | --- | 2,100 | MBTU/hr | --- | --- | --- | Daily | Calculation |
| Spectrus CT-1300 | --- | --- | --- | --- | <25 | ug/l | Every 3 Hrs During Discharge | Grab |
| Hydrazine | | | | | | | | |
| Continuous Discharge (during power operation) | | | | | | | | |
| Through DATE 1 YEAR FROM EFFECTIVE DATE | (report) | (report) | lbs/day | (report) | (report) | ug/l | Weekly | Grab |
| Beginning DATE 1 YEAR FROM EFFECTIVE DATE | (report) | (report) | lbs/day | <3.0 | (report) | ug/l | Weekly | Grab |
| Intermittent Discharge (during outages) | --- | (report) | lbs/day | --- | 32 | ug/l | Daily | Grab |
| Hydrazine Discharge Duration | --- | (report) | min/day | --- | --- | --- | Daily | Report Total Discharge Duration |
| Chloride | --- | --- | --- | --- | (report) | mg/l | Monthly | Grab |
| Sulfate | --- | --- | --- | --- | (report) | mg/l | Monthly | Grab |
| Total Residual Oxidant (TRO) | | | | | | | | |
| During Chlorination – No Bromine Use | | | | | | | | |
| Continuous (greater than 120 min/day) | --- | --- | --- | --- | 38 | ug/l | 5X Weekly | Grab |
| Total Residual Chlorine (TRC) Discharge Duration | --- | (report) | min/day | --- | --- | --- | Daily | Report Total Discharge Duration |
| | | | | Instantaneous Maximum | | | | |
| Intermittent (less than/equal to 120 min/day) | --- | --- | --- | 300 | 200 | ug/l | Daily | Grab |
| Total Residual Chlorine (TRC) Discharge Duration | --- | 120 | min/day | --- | --- | --- | Daily | Report Total Discharge Duration |

PART I

Section A. Limitations and Monitoring Requirements

| Parameter | Maximum Limits for Quantity or Loading | | | Maximum Limits for Quality or Concentration | | | Monitoring Frequency | Sample Type |
|--------------------------------------------------------|----------------------------------------|----------|---------|---------------------------------------------|----------|-------|----------------------|---------------------------------|
| | Monthly | Daily | Units | Monthly | Daily | Units | | |
| During Bromination – Alone or With Concurrent Chlorine | | | | | | | | |
| | | | | <u>Instantaneous Maximum</u> | | | | |
| Intermittent (less than/equal to 120 min/day) | --- | --- | --- | 50 | --- | ug/l | Daily | Grab |
| TRO Discharge Duration | --- | 120 | min/day | --- | --- | --- | Daily | Report Total Discharge Duration |
| Total Mercury | | | | <u>Monthly</u> | | | | |
| Corrected | (report) | (report) | lbs/day | (report) | (report) | ng/l | Annually | Calculation |
| Uncorrected | --- | --- | --- | --- | (report) | ng/l | Annually | Grab |
| Field Duplicate | --- | --- | --- | --- | (report) | ng/l | Annually | Grab |
| Field Blank | --- | --- | --- | --- | (report) | ng/l | Annually | Preparation |
| Laboratory Method Blank | --- | --- | --- | --- | (report) | ng/l | Annually | Preparation |
| | | | | <u>Minimum Daily</u> | | | | |
| pH | --- | --- | --- | 6.5 | 9.0 | S.U. | Daily | Grab |

- a. **Narrative Standard**
The receiving water shall contain no turbidity, color, oil films, floating solids, foams, settleable solids, suspended solids, or deposits as a result of this discharge in unnatural quantities which are or may become injurious to any designated use.
- b. **Monitoring Location**
Samples, measurements, and observations taken in compliance with the monitoring requirements above shall be taken prior to discharge to Lake Michigan.
- c. **Outfall Observation**
Outfall observation shall be reported as "yes" or "no." The permittee shall report yes if this requirement was completed and no if this requirement was not completed. Any unusual characteristics of the discharge (i.e., unnatural turbidity, color, oil film, floating solids, foams, settleable solids, suspended solids, or deposits) shall be reported within 24 hours to the Department followed with a written report within five (5) days detailing the findings of the investigation and the steps taken to correct the condition.

PART I

Section A. Limitations and Monitoring Requirements

- d. Remote Monitoring
Outfall observation shall be conducted through on-site visual inspection by qualified personnel at the frequency specified in Part I.A.1. of this permit or the Department's approval for reduced monitoring. If qualified personnel will not be on site at this frequency and the treatment system has continuous remote monitoring equipment, the permittee may request, in writing, Department approval to conduct less frequent on-site visual inspections. Upon receipt of written approval and consistent with such approval, the permittee may monitor the treatment system remotely and shall conduct on-site visual inspections at the frequency specified in the Department's approval letter. At a minimum, on-site visual inspections shall be conducted two (2) days per month, approximately once every 14 days. If the remote monitoring equipment becomes temporarily inoperable, outfall observation shall be conducted through on-site visual inspection by qualified personnel at the frequency specified in either Part I.A.1. of this permit or the Department's approval for reduced monitoring, until the remote monitoring equipment is once again operable. The qualified personnel conducting the monitoring shall identify and record the dates and times of remote monitoring vs. on-site monitoring, and these records shall be retained in accordance with Part II.B.5. of this permit.
- e. Annual Monitoring
Annual samples shall be taken during the month of July. If the facility does not discharge during these months, the permittee shall sample the next discharge occurring during the period in question. If the facility does not discharge during the period in question, a sample is not required for that period. For any month in which a sample is not taken, the permittee shall enter "*G" on the Discharge Monitoring Report (DMR). (For purposes of reporting on the Daily tab of the DMR, the permittee shall enter "*G" on the first day of the month only).
- f. Monitoring for Hydrazine
The effluent limitations and monitoring requirements for Hydrazine apply only when water treatment additives containing Hydrazine are used and discharged. The permittee shall enter "*G" on the Discharge Monitoring Report for Hydrazine when water treatment additives containing Hydrazine are not used and discharged.
- Compliance with the limitations for the continuous discharge of Hydrazine (maximum monthly average) apply during normal power operation at the plant when a lower concentration of Hydrazine is maintained in the system. Compliance with the limitations for the intermittent discharge of Hydrazine (maximum daily) apply during refueling and other forced outages when a higher concentration of Hydrazine is maintained in the system. The limitations for the intermittent discharge of Hydrazine shall only apply when the discharge duration is less than four consecutive days. If the duration of the discharge is expected to last four consecutive days or longer, the continuous effluent limitations shall apply. The permittee shall notify the Department verbally and via the MiEnviro Portal prior to each intermittent discharge of Hydrazine and shall record the start and end times of the intermittent discharge on the DMR. The permittee shall enter "*G" on the DMR for the Hydrazine discharge mode not being used. (For purposes of reporting on the Daily tab of the DMR, the permittee shall enter "*G" on the first day of the month only.) The Department may modify these requirements upon notification to the permittee.
- g. Limits Below the Quantification Level – Hydrazine
The sampling procedures, preservation and handling, and analytical protocol for compliance monitoring for Hydrazine shall be in accordance with ASTM Method D1385-07. Upon approval from the Department, the permittee may use alternate analytical methods (for parameters with methods specified in 40 CFR, Part 136, the alternate methods are restricted to those listed in 40 CFR, Part 136). The maximum acceptable quantification level shall be 3.0 ug/l unless a higher level is appropriate because of sample matrix interference. Justification for a higher quantification level shall be submitted to the Department within 30 days of such determination.

PART I

Section A. Limitations and Monitoring Requirements

The maximum monthly average water quality-based effluent limitation for Hydrazine is 1.0 ug/l (1.2 lbs/day). This is less than the quantification level. Control requirements are therefore established consistent with R 323.1213. **Any discharge of Hydrazine during normal operations (not outages) at or above the quantification level is a specific violation of this permit.** If concentrations in all samples representing a monitoring period are less than the quantification level, the permittee will be considered to be in compliance with the permit for the monitoring period that the samples represent, provided that the permittee is also in full compliance with the Pollutant Minimization Program for Hydrazine set forth in Part I.A.8. of this permit. For the purpose of reporting on the Daily tab of the DMR, individual sample results less than the quantification level shall be reported as "<3.0." Calculations shall be made using the quantification level in place of any sample result less than the quantification level, and the calculated value ("X") resulting from any calculation made using one or more sample results below quantification shall be reported as less than the calculated value X (i.e., "<X"). For additional guidance including examples, see the document entitled "Reporting Results Below Quantification," available at: <https://www.michigan.gov/-/media/Project/Websites/egle/Documents/Programs/WRD/MiEnviro/results-below-quantification.pdf?rev=7e8dda12c72643d9a974c1d65e6a2957>.

This permit condition does not authorize the discharge of this parameter at levels that are injurious to the designated uses of the waters of the state or that constitute a threat to the public health or welfare.

h. Total Mercury Testing and Additional Reporting Requirements

The analytical protocol for total mercury shall be in accordance with EPA Method 1631, Revision E, "Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry," EPA-821-R-02-019, August 2002. The quantification level for total mercury shall be 0.5 ng/l, unless a higher level is appropriate because of sample matrix interference. Justification for higher quantification levels shall be submitted to the Department within 30 days of such determination.

The use of clean technique sampling procedures is required unless the permittee can demonstrate to the Department that an alternate sampling procedure is representative of the discharge. Guidance for clean technique sampling is set forth in EPA Method 1669, "Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels (Sampling Guidance)," EPA-821-R96-001, July 1996. Information and data documenting the permittee's sampling and analytical protocols and data acceptability shall be submitted to the Department upon request.

In order to demonstrate compliance with EPA Method 1631E and EPA Method 1669, the permittee shall report, on the daily sheet, the analytical results of all field blanks and field duplicates collected in conjunction with each sampling event, as well as laboratory method blanks when used for blank correction. The permittee shall collect at least one (1) field blank and at least one (1) field duplicate per sampling event. If more than 10 samples are collected during a sampling event, the permittee shall collect at least one (1) additional field blank AND field duplicate for every 10 samples collected. A "sampling event" shall be defined herein as all sampling for total mercury conducted on the same day, provided the same sampling team collected all samples using the same sampling methods, procedures, and equipment on that day. Only field blanks or laboratory method blanks may be used to calculate a concentration lower than the actual sample analytical results (i.e., a blank correction). Only one (1) blank (field OR laboratory method) may be used for blank correction of a given sample result, and only if the blank meets the quality control acceptance criteria. If blank correction is not performed on a given sample analytical result, the permittee shall report under "Total Mercury – Corrected" the same value reported under "Total Mercury – Uncorrected." The field duplicate is for quality control purposes only; its analytical result shall not be averaged with the sample result.

PART I

Section A. Limitations and Monitoring Requirements

- i. Total Residual Oxidant (Chlorine and Bromine) Requirements
Total Residual Oxidant (TRO) shall be analyzed in accordance with Part II.B.2. of this permit.

TRO monitoring is only required during periods of chlorine or bromine use and subsequent discharge. Limitations for the intermittent discharge of chlorine apply only when the discharge of chlorine is less than or equal to 120 minutes per day; otherwise, the limitations for continuous discharge of chlorine apply. Authorization to discharge bromine with or without chlorine is limited to 120 minutes per day at the limitations specified above, with the additional requirement that any discharge of chlorine is restricted to a concurrent discharge with bromine (no additional discharge of chlorine is authorized for that day).

During the intermittent discharge of chlorine without bromine ("During Chlorination - No Bromine Use" limitations given above), the daily concentration value reported for TRO shall be the average of a minimum of three (3) equally spaced grab samples taken during a chlorine discharge event, with the additional limitation that no single sample may exceed 300 ug/l.

During the intermittent discharge of bromine with or without chlorine ("During Bromination – Alone or With Concurrent Chlorine" limitations given above), the daily concentration value reported for TRO shall be the maximum of at least three (3) equally spaced grab samples taken during a bromine discharge event, where no single sample may exceed 50 ug/l.

During the continuous discharge of chlorine, a minimum of one (1) TRC sample shall be taken during the chlorine discharge event.

The permittee shall enter "*"G" on the DMR for the TRO discharge modes not being used. (For purposes of reporting on the Daily tab of the DMR, the permittee shall enter "*"G" on the first day of the month only).

Upon written approval from the Department, the permittee may use a dehalogenating reagent as a water treatment additive, including but not limited to sodium thiosulfate, sodium bisulfite, and sodium sulfite, to achieve applicable TRO limitations. Requests for such approval shall be submitted in accordance with Part I.A.4. of this permit. The quantity of the reagent(s) used shall be limited to 0.6 times the stoichiometric amount of TRO for sodium thiosulfate, 1.5 times the stoichiometric amount of TRO for sodium bisulfite, and 1.8 times the stoichiometric amount of TRO for sodium sulfite. For guidance and example calculations, see the Department's "Calculator to Determine Stoichiometric Amount of Dechlor Agent," available at <https://www.michigan.gov/egle/about/organization/water-resources/npdes/compliance-assistance>. TRO samples taken to determine the amount of each reagent to add shall be taken upstream of dehalogenation.

- j. Zebra Mussel Control Requirements
The discharge of Spectrus CT-1300 is restricted to no more than six (6) times per year, for no more than 12 hours per discharge event. The permittee shall notify the Department at least one (1) week prior to each discharge.

The sampling procedures, preservation and handling, and analytical protocol for compliance monitoring for Spectrus CT-1300 shall be in accordance with the Orange II/Methylene Chloride Method. The quantification level shall not exceed 25 ug/l for Spectrus CT-1300, unless higher levels are appropriate because of sample matrix interference. Justification for higher quantification levels shall be submitted to the Department within 30 days of such determination. Other methods may be used upon approval from the Department. The highest value measured during the discharge event shall be reported. If the concentration in all samples is less than the quantification level, report "<25" on the DMR.

PART I

Section A. Limitations and Monitoring Requirements

The water quality-based effluent limitation for Spectrus CT-1300 is 15 ug/l daily maximum. If the water quality-based effluent limitation is less than the quantification level using the specified analytical method, the permittee shall detoxify the treated effluent from Monitoring Point 001A using bentonite clay (which shall be added as a prewetted slurry to ensure proper mixing and to maximize detoxification potential) when appropriate. Additionally, the permittee shall conduct 48-hour acute toxicity testing using a Daphnia species on the Monitoring Point 001A effluent to verify that adequate detoxification of Spectrus CT-1300 is occurring. Testing shall be conducted on the discharge during the first treatment of the product. Testing shall be conducted using procedures contained in EPA-821-R-02-012, "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms" (Fifth Edition). The results of the toxicity testing and discharge concentrations shall be submitted to the Department within 30 days following the first treatment of the product.

As an alternative to the requirements listed in the previous paragraph, the permittee may choose to demonstrate to the Department, through mass-balance calculations, that the final effluent limit of 15 ug/l for Spectrus CT-1300 will be met. Upon approval from the Department, detoxification with bentonite clay and toxicity testing will not be required.

Any discharge of Spectrus CT-1300 at or above the indicated quantification level is a specific violation of this permit. If all samples in any monthly reporting period are less than the above quantification level, and if toxicity testing is required because of the lack of a successful demonstration, the results of the effluent toxicity testing do not exceed 1.0 acute toxic units (TU_A), the Department will consider the permittee to be in compliance with the final effluent limitations for this pollutant for that reporting period, provided that the permittee is also in full compliance with the Pollutant Minimization Program for Spectrus CT-1300 set forth in Part I.A.9. of this permit.

If the results of effluent toxicity testing for the product exceeds 1.0 TU_A, the permittee shall discontinue use of that product and notify the Department. The permittee will not be authorized to discharge that product until a demonstration is made to the Department that 1.0 TU_A will be consistently achieved and the Department approves its use and discharge.

k. Thermal Discharge Calculation

Thermal discharge shall be determined using the following calculation: (flow rate in MGD) **multiplied by** (the conversion factor of 8.34) **multiplied by** (discharge temperature in °F **minus** intake temperature in °F), **divided by** 24. The resulting value is the amount of thermal discharge in MBTU/hr. Intake temperature monitoring requirements are specified in Part I.A.3. of this permit.

l. Storm Water Pollution Prevention

In addition to the requirements set forth in Part I.A.1. above, the storm water drainage area associated with Monitoring Point 001A shall be managed in accordance with Part I.B. – Storm Water Pollution Prevention, with the exception that the outfall observation requirement shall take the place of the visual assessment requirement.

PART I**Section A. Limitations and Monitoring Requirements****2. Final Effluent Limitations, Monitoring Points 001D and 001F**

During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, the permittee is authorized to discharge a maximum of 0.1 MGD of treated low volume wastewater consisting of treated radwaste wastewater and steam generator blowdown from Monitoring Point 001D through Monitoring Point 001A and Outfall 001, and a maximum of 0.1 MGD of treated low volume wastewater consisting of treated turbine sump drainage including steam generator blowdown, demineralizer backwash and regeneration waste, reverse osmosis filter backwash, turbine sump drainage, floor drainage, and laboratory waste from Monitoring Point 001F through Monitoring Point 001A and Outfall 001. Outfall 001 discharges to Lake Michigan at Latitude 42.32337, Longitude -86.31557. Such discharge shall be limited and monitored by the permittee as specified below.

| <u>Parameter</u> | <u>Maximum Limits for Quantity or Loading</u> | | | <u>Maximum Limits for Quality or Concentration</u> | | | <u>Monitoring Frequency</u> | <u>Sample Type</u> |
|---------------------------------------------------------------|-----------------------------------------------|--------------|--------------|----------------------------------------------------|--------------|--------------|-----------------------------|-------------------------|
| | <u>Monthly</u> | <u>Daily</u> | <u>Units</u> | <u>Monthly</u> | <u>Daily</u> | <u>Units</u> | | |
| Monitoring Point 001D (treated radwaste wastewater): | | | | | | | | |
| Flow | (report) | (report) | MGD | --- | --- | --- | Daily | Report Total Daily Flow |
| Oil and Grease | --- | --- | --- | 15 | 20 | mg/l | Annually | Grab |
| Total Suspended Solids | --- | --- | --- | 30 | 100 | mg/l | Per Batch | Grab |
| Monitoring Point 001F (treated turbine sump drainage): | | | | | | | | |
| Flow | (report) | (report) | MGD | --- | --- | --- | Daily | Report Total Daily Flow |
| Oil and Grease | --- | --- | --- | 15 | 20 | mg/l | 2X Monthly | Grab |
| Total Suspended Solids | --- | --- | --- | 30 | 100 | mg/l | Monthly | Grab |

- a. **Monitoring Location**
Samples, measurements, and observations taken in compliance with the monitoring requirements above shall be taken prior to discharge to the mixing basin or co-mingling with other wastewaters.
- b. **Annual Monitoring**
Annual samples shall be taken during the month of July. If the facility does not discharge during these months, the permittee shall sample the next discharge occurring during the period in question. If the facility does not discharge during the period in question, a sample is not required for that period. For any month in which a sample is not taken, the permittee shall enter "*G" on the Discharge Monitoring Report (DMR). (For purposes of reporting on the Daily tab of the DMR, the permittee shall enter "**G" on the first day of the month only).

PART I**Section A. Limitations and Monitoring Requirements****3. Intake Structure Monitoring**

The intake structure at the Palisades Power Plant withdraws water from Lake Michigan at Latitude 42.325833, Longitude -86.326944. The intake structure shall be limited and monitored by the permittee as specified below.

| <u>Parameter</u> | <u>Maximum Limits for Quantity or Loading</u> | | | <u>Maximum Limits for Quality or Concentration</u> | | | <u>Monitoring Frequency</u> | <u>Sample Type</u> |
|--------------------|-----------------------------------------------|--------------|--------------|----------------------------------------------------|--------------|--------------|-----------------------------|-------------------------|
| | <u>Monthly</u> | <u>Daily</u> | <u>Units</u> | <u>Monthly</u> | <u>Daily</u> | <u>Units</u> | | |
| Intake Flow | (report) | (report) | MGD | --- | --- | --- | Daily | Report Total Daily Flow |
| Intake Observation | | | | | | | | |
| Daily Observation | (report) | --- | --- | --- | --- | --- | Daily | Visual |
| Annual Inspection | (report) | --- | --- | --- | --- | --- | See Part I.A.7.d. | Visual |
| Intake Temperature | --- | --- | --- | --- | (report) | °F | Daily | Reading |

- a. **Intake Screen Backwash**
The permittee is authorized to discharge intake screen backwash from Outfall 001 to Lake Michigan. The permittee shall collect and remove debris accumulated on or around the intake trash racks and traveling screens and dispose of such material on land in an appropriate manner.
- b. **Intake Observation**
Intake observation shall be reported as "yes" or "no." The permittee shall report yes if this requirement was completed and no if this requirement was not completed. For any month in which an observation is not completed, the permittee shall enter "*"G" on the Discharge Monitoring Report (DMR). (For purposes of reporting on the Daily tab of the DMR, the permittee shall enter "*"G" on the first day of the month only). Intake observation requirements are specified in Part I.A.7.d.
- c. **Intake Temperature**
Intake Temperature readings shall be taken at approximately the same day as effluent temperature readings and concentrations are taken. Intake Temperature readings shall be used in calculating the Thermal Discharge Calculation that is specified in Part I.A.1.

PART I**Section A. Limitations and Monitoring Requirements****4. Request for Approval to Use Water Treatment Additives**

This permit does not authorize the use of any water treatment additive without prior written approval from the Department. Such approval is authorized under separate correspondence. Water treatment additives include any materials that are added to water used at the facility, or to wastewater generated by the facility, to condition or treat the water. Permittees proposing to use water treatment additives, including a proposed increased concentration of a previously approved water treatment additive, shall submit a request for approval via the Department's MiEnviro Portal system. The MiEnviro Portal website is located at <https://mienviro.michigan.gov/ncore/>. Instructions for submitting such a request may be obtained at <http://www.michigan.gov/eglenpdes> (near the center of that page, click on one or both links). Additional monitoring and reporting may be required as a condition of approval to use the water treatment additive.

A request for approval to use water treatment additives shall include all of the following usage and discharge information for each water treatment additive proposed to be used:

- a. The Safety Data Sheet (SDS);
- b. Ingredient information, including the name of each ingredient, CAS number for each ingredient, and fractional content by weight for each ingredient;
- c. The proposed water treatment additive discharge concentration with supporting calculations;
- d. The discharge frequency (i.e., number of hours per day and number of days per year);
- e. The outfall(s) and monitoring point(s) from which the water treatment additive is to be discharged;
- f. The type of removal treatment, if any, that the water treatment additive receives prior to discharge;
- g. The water treatment additive's function (i.e., microbiocide, flocculant, etc.);
- h. The SDS shall include a 48-hour LC50 or EC50 for a North American freshwater planktonic crustacean (either *Ceriodaphnia sp.*, *Daphnia sp.*, or *Simocephalus sp.*). The results shall be based on the whole water treatment additive, shall not be results based on a similar product, and shall not be estimated; and
- i. The SDS shall include the results of a toxicity test for one (1) other North American freshwater aquatic species (other than a planktonic crustacean) that meets a minimum requirement of R 323.1057(2) of the Water Quality Standards. The results shall be based on the whole water treatment additive, shall not be results based on a similar product, and shall not be estimated. Examples of tests that would meet this requirement include a 96-hour LC50 for rainbow trout, bluegill, or fathead minnow.

PART I**Section A. Limitations and Monitoring Requirements****5. Quantification Levels and Analytical Methods for Selected Parameters**

Maximum acceptable quantification levels (QLs) are specified for selected parameters in the table below. These QLs apply to all monitoring conducted in compliance with this permit if and when the parameters specified herein are monitored. This includes monitoring conducted to meet the requirements of the application for permit reissuance. These QLs shall be considered the maximum acceptable unless a higher QL is appropriate because of sample matrix interference. Justification for higher QLs shall be submitted to the Department within 30 days of such determination.

Where necessary to help ensure that the QLs specified herein can be achieved, analytical methods may also be specified in the table below. The sampling procedures, preservation and handling, and analytical protocol for all monitoring conducted in compliance with this permit, including monitoring conducted to meet the requirements of the application for permit reissuance, shall be in accordance with the methods specified herein, or in accordance with Part II.B.2. of this permit if no method is specified herein, unless an alternate method is approved by the Department. The Department will consider only alternate methods that meet the requirements of Part II.B.2. and whose QLs are at least as sensitive (i.e., low) as those specified herein. Not all QLs are expressed in the same units in the table below. The table is continued on the following page:

| Parameter | QL | Units | Analytical Method |
|---------------------------------------|-----------|--------------|--------------------------|
| 1,2-Diphenylhydrazine (as Azobenzene) | 3.0 | ug/l | |
| 2,4,6-Trichlorophenol | 5.0 | ug/l | |
| 2,4-Dinitrophenol | 19 | ug/l | |
| 3,3'-Dichlorobenzidine | 1.5 | ug/l | |
| 4-Chloro-3-Methylphenol | 7.0 | ug/l | |
| 4,4'-DDD | 0.01 | ug/l | |
| 4,4'-DDE | 0.01 | ug/l | |
| 4,4'-DDT | 0.01 | ug/l | |
| Acrylonitrile | 1.0 | ug/l | |
| Aldrin | 0.01 | ug/l | |
| Alpha-Endosulfan | 0.01 | ug/l | |
| Alpha-Hexachlorocyclohexane | 0.01 | ug/l | |
| Antimony, Total | 1 | ug/l | |
| Arsenic, Total | 1 | ug/l | |
| Barium, Total | 5 | ug/l | |
| Benzidine | 0.1 | ug/l | |
| Beryllium, Total | 1 | ug/l | |
| Beta-Endosulfan | 0.01 | ug/l | |
| Beta-Hexachlorocyclohexane | 0.01 | ug/l | |
| Bis (2-Chloroethyl) Ether | 1.0 | ug/l | |
| Bis (2-Ethylhexyl) Phthalate | 5.0 | ug/l | |
| Boron, Total | 20 | ug/l | |
| Cadmium, Total | 0.2 | ug/l | |
| Chlordane | 0.01 | ug/l | |
| Chloride | 1.0 | mg/l | |
| Chromium, Hexavalent | 5 | ug/l | |
| Chromium, Total | 10 | ug/l | |
| Copper, Total | 1 | ug/l | |
| Cyanide, Available | 2 | ug/l | EPA Method OIA 1677 |
| Cyanide, Total | 5 | ug/l | |
| Delta-Hexachlorocyclohexane | 0.01 | ug/l | |

PERMIT NO. MI0001457

Page 13 of 48

PART I

Section A. Limitations and Monitoring Requirements

| Parameter | QL | Units | Analytical Method |
|----------------------------------|------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dieldrin | 0.01 | ug/l | |
| Di-N-Butyl Phthalate | 9.0 | ug/l | |
| Endosulfan Sulfate | 0.01 | ug/l | |
| Endrin | 0.01 | ug/l | |
| Endrin Aldehyde | 0.01 | ug/l | |
| Fluoranthene | 1.0 | ug/l | |
| Heptachlor | 0.01 | ug/l | |
| Heptachlor Epoxide | 0.01 | ug/l | |
| Hexachlorobenzene | 0.01 | ug/l | |
| Hexachlorobutadiene | 0.01 | ug/l | |
| Hexachlorocyclopentadiene | 0.01 | ug/l | |
| Hexachloroethane | 5.0 | ug/l | |
| Hydrazine | 3.0 | ug/l | ASTM Method D1385-07 |
| Lead, Total | 1 | ug/l | |
| Lindane | 0.01 | ug/l | |
| Lithium, Total | 10 | ug/l | |
| Mercury, Total | 0.5 | ng/l | EPA Method 1631E |
| Nickel, Total | 5 | ug/l | |
| PCB-1016 | 0.1 | ug/l | |
| PCB-1221 | 0.1 | ug/l | |
| PCB-1232 | 0.1 | ug/l | |
| PCB-1242 | 0.1 | ug/l | |
| PCB-1248 | 0.1 | ug/l | |
| PCB-1254 | 0.1 | ug/l | |
| PCB-1260 | 0.1 | ug/l | |
| Pentachlorophenol | 1.8 | ug/l | |
| Perfluorooctane sulfonate (PFOS) | 2.0 | ng/l | While EPA Method 1633 remains draft, analyses may be performed using that method, or ASTM D7979, or an isotope dilution method (sometimes referred to as Method 537 modified). Once EPA Method 1633 is promulgated, only that method may be used. |
| Perfluorooctanoic acid (PFOA) | | | |
| Perfluorobutanesulfonate (PFBS) | | | |
| Phenanthrene | 1.0 | ug/l | |
| Phosphorus (as P), Total | 10 | ug/l | |
| Selenium, Total | 1.0 | ug/l | |
| Silver, Total | 0.5 | ug/l | |
| Strontium, Total | 1000 | ug/l | |
| Sulfate | 2.0 | mg/l | |
| Sulfide, Total | 20 | ug/l | |
| Thallium, Total | 1 | ug/l | |
| Toxaphene | 0.1 | ug/l | |
| Vinyl Chloride | 1.0 | ug/l | |
| Zinc, Total | 10 | ug/l | |

PART I

Section A. Limitations and Monitoring Requirements

6. Cold Shock Prevention

Cessation of thermal inputs to the receiving water by this facility shall occur gradually so as to avoid fish mortality due to cold shock during the winter months (November through March). The basis for this requirement is to allow fish associated with the discharge-heated mixing zone for Outfall 001 to acclimate to the decreasing temperature.

7. Cooling Water Intake Structure

The federal rules promulgated by the United States Environmental Protection Agency in 40 CFR Parts 122 and 125 establish the requirements of section 316(b) of the Clean Water Act for Existing Facilities. The Existing Facilities Rule applies to facilities with point source discharges having one or more cooling water intake structure (CWIS) with a cumulative design intake flow of greater than 2 million gallons per day (MGD) and 25% or more of the water the facility withdraws on an actual intake flow (AIF) basis is used exclusively for cooling purposes. The cooling water intake structure operated by the permittee has been reviewed and determined to comply with the Best Technology Available (BTA) standards for impingement mortality and entrainment to minimize adverse environmental impact in accordance with 40 CFR Subpart J under Section 316(b) of the Clean Water Act.

Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for previous or future fish losses. Nothing in this permit authorizes take for the purposes of a facility's compliance with the Endangered Species Act in accordance with 40 CFR § 125.98(b)(1).

- a. **Best Technology Available Standards for Impingement Mortality**
The chosen method of compliance for impingement is 40 CFR § 125.94(c)(1) – closed-cycle recirculating system. The permittee must operate a closed-cycle recirculating system defined in 40 CFR § 125.92(c) as a system designed and properly operated using minimized make-up and blowdown flows withdrawn from a water of the United States to support non-contact cooling uses within a facility, or a system designed to include certain impoundments.
- b. **Monitoring Requirements**
The permittee shall monitor the actual intake flows at a minimum frequency of daily as specified in Part I.A.3. The monitoring must be representative of normal operating conditions, and must include measuring cooling water withdrawals, make-up water, and blow down volume. In lieu of daily intake flow monitoring, upon request, the Department may approve the permittee to monitor the cycles of concentration at a minimum frequency of daily.
- c. **Proper Operation and Maintenance**
The permittee shall ensure that the CWIS associated equipment at this facility is properly operated and maintained at all times to minimize adverse environmental impact. This includes removal of floating debris and accumulated trash collected on the intake screens in a manner to prevent any pollutant from the material entering the waters of the State.
- d. **Equipment Inspection**
The permittee shall conduct either visual inspections or employ remote monitoring devices during the period the cooling water intake structure is in operation to ensure the intakes are maintained and operated to function as designed. The Department may establish alternative procedures if this requirement is not feasible (e.g., an offshore intake, velocity cap, or during periods of inclement weather). The permittee shall also conduct visual inspections of the velocity cap and submerged portion of the intake structure utilizing commercial divers as described in the application at least once every three years, when the plant is not operating. After plant operations restart, the permittee shall conduct annual visual inspections of the velocity cap and submerged portion of the intake structure utilizing commercial divers as described in the application.

PART I

Section A. Limitations and Monitoring Requirements

The permittee shall keep records of the daily visual inspections, including any observations made during the visual inspection, and make available upon request by the Department. If weather or other unsafe or hazardous conditions exist, if raising the screen to conduct the inspection may cause damage to the screen or other equipment, the permittee shall document the conditions that preclude any inspection from taking place. Any unusual characteristics of the intake that result in a violation of the BTA Standards for Impingement Mortality shall be verbally reported within 24 hours to the Department followed with a written report within five (5) days detailing the findings of the investigation and the steps taken to correct the condition.

e. Changes to the Equipment

The permittee shall ensure that advance notice is given to the Department of any planned changes in the location, design, operation, or capacity of the CWIS associated equipment specific to the operations at this facility. If the Department determines that additional technologies or control measures are necessary to reduce the impact of impingement or entrainment, the Department may revise the requirements of this condition or permit.

f. Annual Certification Statement and Report

On or before February 1 of each year, the permittee shall submit an annual certification and report for the previous calendar year to the Department, signed by the responsible corporate officer as defined in 40 CFR 122.22 in accordance with 40 CFR 125.97(c) that includes:

- 1) a certification that water intake structure technologies are being maintained and operated as set forth in this permit;
- 2) a summary of the required visual inspections;
- 3) a summary of any modified operation of any unit at the facility that impacts cooling water withdrawals or operation of cooling water intake structures; and

If the information contained in the previous year's annual certification and report is still pertinent, the permittee may state as such in a letter to the Department and the letter, along with any applicable data submission requirements associated with the annual certification statement and report, shall constitute the annual certification.

Records of all submissions that are part of the permit reporting requirement under 40 CFR § 125.97 shall be retained by the permittee at a minimum until the subsequent permit is issued. In addition, records supporting the Department's BTA determination for entrainment shall be retained until such time the Department revises the BTA determination for entrainment in the permit. The Department may require supplemental reporting and/or data collection under 40 CFR Parts 122 and 125.

During each permit reissuance, the Department will reevaluate the facility's CWIS to determine if it represents BTA for minimizing adverse environmental impacts. On or before April 4, 2028, with the application for reissuance, the permittee shall submit all information required in 40 CFR § 122.21(r). The permittee must certify that the permit application is true, accurate and complete pursuant to 40 CFR § 122.22(d). The permittee may request in writing Department approval of a reduction of information required for subsequent permit applications if conditions at the facility and in the waterbody remain substantially unchanged since the previous application. The permittee must submit its request for reduced cooling water intake structure and waterbody application information prior to April 1, 2026. The request must identify each element in 40 CFR § 122.21(r) that the permittee determines has not substantially changed since the previous permit application and the basis for the determination. The Department has the discretion to accept or reject any part of the request. Records of all submissions that are part of the previous permit application shall be retained by the permittee at a minimum until the subsequent permit is issued in accordance with 40 CFR § 125.95.

PERMIT NO. MI0001457

Page 16 of 48

PART I**Section A. Limitations and Monitoring Requirements****8. Pollutant Minimization Program for Hydrazine**

This requirement establishes the program necessary to comply with the final effluent limitations for Hydrazine. The goal of the Pollutant Minimization Program is to maintain the effluent concentration of Hydrazine at or below the water quality-based effluent limitation set forth in Part I.A.1. The permittee shall develop and implement a Pollutant Minimization Program in accordance with the following schedule:

At least 90 days before the start of plant operations, the permittee shall submit to the Department an approvable Pollutant Minimization Program for Hydrazine designed to proceed toward the goal. The Pollutant Minimization Program shall be implemented upon approval by the Department. The Pollutant Minimization Program shall include the following:

- a. an annual review and semi-annual monitoring of potential sources of Hydrazine entering the wastewater collection system;
- b. a program for quarterly monitoring of influent for Hydrazine; and
- c. implementation of reasonable cost-effective control measures when sources of Hydrazine are discovered. Factors to be considered include significance of sources, economic considerations, and technical and treatability considerations.

On or before March 1 of each year following Department approval of the Pollutant Minimization Program, the permittee shall submit a status report to the Department that includes 1) the monitoring results for the previous year, 2) an updated list of potential sources, and 3) a summary of all actions taken to reduce or eliminate identified sources of Hydrazine.

Any information generated as a result of the Pollutant Minimization Program set forth in this permit may be used to support a request to modify the approved program or may demonstrate that the Pollutant Minimization Program requirement has been completed satisfactorily.

A request for modification of the approved program and supporting documentation shall be submitted in writing to the Department for review and approval. The Department may approve modifications to the approved program (approval of a program modification does not require a permit modification).

The permittee may choose to demonstrate that the program is complete and request removal of the program from the permit. Such request and supporting documentation demonstrating that the water quality-based effluent limits are being achieved shall be submitted in writing to the Department. If the Department determines that the request is approvable, this permit may be modified in accordance with applicable laws and rules to remove this requirement.

This permit may be modified in accordance with applicable laws and rules to include additional conditions and/or limitations as necessary.

PERMIT NO. MI0001457

Page 17 of 48

PART I**Section A. Limitations and Monitoring Requirements****9. Pollutant Minimization Program for Spectrus CT-1300**

This requirement establishes the program necessary to comply with the final effluent limitations for Spectrus CT-1300. The goal of the Pollutant Minimization Program is to maintain the effluent concentration of Spectrus CT-1300 at or below the water quality-based effluent limitation set forth in Part I.A.1. The permittee shall develop and implement a Pollutant Minimization Program in accordance with the following schedule:

On or before DATE 90 DAYS FROM PERMIT EFFECTIVE DATE, the permittee shall submit to the Department an approvable Pollutant Minimization Program for Spectrus CT-1300 designed to proceed toward the goal. The Pollutant Minimization Program shall be implemented upon approval by the Department. The Pollutant Minimization Program shall include the following:

- a. an annual review and semi-annual monitoring of potential sources of Spectrus CT-1300 entering the wastewater collection system;
- b. a program for quarterly monitoring of influent for Spectrus CT-1300; and
- c. implementation of reasonable cost-effective control measures when sources of Spectrus CT-1300 are discovered. Factors to be considered include significance of sources, economic considerations, and technical and treatability considerations.

On or before March 1 of each year following Department approval of the Pollutant Minimization Program, the permittee shall submit a status report to the Department that includes 1) the monitoring results for the previous year, 2) an updated list of potential sources, and 3) a summary of all actions taken to reduce or eliminate identified sources of Spectrus CT-1300.

Any information generated as a result of the Pollutant Minimization Program set forth in this permit may be used to support a request to modify the approved program or may demonstrate that the Pollutant Minimization Program requirement has been completed satisfactorily.

A request for modification of the approved program and supporting documentation shall be submitted in writing to the Department for review and approval. The Department may approve modifications to the approved program (approval of a program modification does not require a permit modification).

The permittee may choose to demonstrate that the program is complete and request removal of the program from the permit. If the permittee is able to use a test method that utilizes a quantification level sufficient to determine compliance with the effluent limitation, the permittee may request the suspension of the requirements of this condition while the test method is utilized. Such request and supporting documentation demonstrating that the water quality-based effluent limits are being achieved shall be submitted in writing to the Department. If the Department determines that the request is approvable, this requirement may be waived and/or the permit may be modified in accordance with applicable laws and rules to remove this requirement.

This permit may be modified in accordance with applicable laws and rules to include additional conditions and/or limitations as necessary.

PART I

Section A. Limitations and Monitoring Requirements

10. Facility Contact

The "Facility Contact" was specified in the application. The permittee may replace the facility contact at any time, and shall notify the Department in writing within 10 days after replacement (including the name, address and telephone number of the new facility contact).

- a. The facility contact shall be (or a duly authorized representative of this person):
 - for a corporation, a principal executive officer of at least the level of vice president; or a designated representative if the representative is responsible for the overall operation of the facility from which the discharge originates, as described in the permit application or other NPDES form,
 - for a partnership, a general partner,
 - for a sole proprietorship, the proprietor, or
 - for a municipal, state, or other public facility, either a principal executive officer, the mayor, village president, city or village manager or other duly authorized employee.
- b. A person is a duly authorized representative only if:
 - the authorization is made in writing to the Department by a person described in paragraph a. of this section; and
 - the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the facility (a duly authorized representative may thus be either a named individual or any individual occupying a named position).

Nothing in this section releases the permittee from properly submitting reports and forms as required by law.

11. Discharge Monitoring Report – Quality Assurance Study Program

The permittee shall participate in the Discharge Monitoring Report – Quality Assurance (DMR-QA) Study Program. The purpose of the DMR-QA Study Program is to annually evaluate the proficiency of all in-house and/or contract laboratory(ies) that perform, on behalf of the facility authorized to discharge under this permit, the analytical testing required under this permit. In accordance with Section 308 of the Clean Water Act (33 U.S.C. § 1318); and R 323.2138 and R 323.2154 of Part 21, Wastewater Discharge Permits, promulgated under Part 31 of the NREPA, participation in the DMR-QA Study Program is required for all major facilities, and for minor facilities selected for participation by the Department.

Annually and in accordance with DMR-QA Study Program requirements and submittal due dates, the permittee shall submit to the Michigan DMR-QA Study Program state coordinator all documentation required by the DMR-QA Study. DMR-QA Study Program participation is required only for the analytes required under this permit and only when those analytes are also identified in the DMR-QA Study.

If the permitted facility's status as a major facility should change, participation in the DMR-QA Study Program may be reevaluated. Questions concerning participation in the DMR-QA Study Program should be directed to the Michigan DMR-QA Study Program state coordinator.

All forms and instructions required for participation in the DMR-QA Study Program, including submittal due dates and state coordinator contact information, can be found at <https://www.epa.gov/compliance/discharge-monitoring-report-quality-assurance-study-program>.

PART I

Section A. Limitations and Monitoring Requirements

12. Priority Pollutants

The permittee shall not discharge to surface waters of the state any priority pollutant listed in Appendix A of 40 CFR Part 423 in discharges of cooling tower blowdown resulting from plant operations. In the event the permittee proposes to use chemicals for cooling tower maintenance, which may contain such pollutants, the permittee shall submit a request for approval in accordance with Part I.A.4 of this permit. Upon review of such a request, this permit may be modified in accordance with applicable laws and rules to include additional control requirements as necessary.

On or before April 4, 2028, with the application for reissuance, the permittee shall submit written confirmation that no chemicals containing the priority pollutants listed in Appendix A of 40 CFR Part 423 are being used for cooling tower maintenance purposes.

13. Continuous Monitoring

If continuous monitoring equipment is used and becomes temporarily inoperable, the permittee shall manually obtain a minimum of three (3) equally spaced grab samples/readings within each 24-hour period for the affected parameter(s). On such days, in the comment field on the Daily tab of the DMR, the permittee shall indicate "continuous monitoring system inoperable," the date on which the system is expected to become operable again, and the number of samples/readings obtained during each 24-hour period.

14. Power Plants – PCB Prohibition

The permittee shall not discharge any polychlorinated biphenyls (PCBs) to surface waters of the state as a result of plant operations.

On or before April 4, 2028, with the application for reissuance, the permittee shall submit written confirmation that no PCB compounds have been or will be discharged to surface waters of the state as a result of plant operations.

15. Monitoring Frequency Reduction

The permittee may decommission this facility during this permit cycle. To facilitate this process, the permittee may request, in writing, Department approval of a reduction in monitoring frequency for the parameters indicated in Parts I.A.1., I.A.2., and I.A.3. of this permit. This request shall contain an explanation as to why the reduced monitoring is appropriate. Upon receipt of written approval and consistent with such approval, the permittee may reduce the monitoring frequency indicated in Parts I.A.1., I.A.2., and I.A.3. of this permit. The monitoring frequency for any pollutant shall not be reduced to less than annually. The Department may also eliminate monitoring requirements for any parameter if the parameter being monitored is no longer expected to be present in the discharge at levels of concern due to a discontinuation of a wastewater type being discharged. If a process contributing wastewater has ended but legacy wastewater or residuals still have the potential to be discharged, effluent limitations and/or monitoring for the relevant parameters shall not be eliminated. The Department may revoke the approval for reduced or eliminated monitoring at any time upon notification to the permittee.

16. Plant Start-Up Notification

The permittee shall notify the Department at least 30 days prior to the start-up of plant operations. Beginning on the month of the plant start-up, the final effluent limitations and monitoring requirements for Hydrazine in Part I.A.1. and annual visual inspections of the velocity cap and submerged portion of the intake structure as specified in Part I.A.7.d. shall become effective.

PART I**Section B. Storm Water Pollution Prevention****1. Final Effluent Limitations and Monitoring Requirements**

The permittee is authorized to discharge storm water associated with industrial activity, as defined under 40 CFR 122.26(b)(14)(i-ix), to Lake Michigan. Such discharge shall be limited and monitored by the permittee as specified below.

- a. **Narrative Standard**
In accordance with R 323.1050 of the Part 4 Rules promulgated pursuant to Part 31 of the NREPA, the receiving waters shall not have any of the following physical properties as a result of this discharge in unnatural quantities that are, or may become, injurious to any designated use: turbidity, color, oil films, floating solids, foams, settleable solids, suspended solids, or deposits.
- b. **Unusual Discharge Characteristics**
Storm water discharges shall be monitored as required by this permit to ensure there are no unusual characteristics (i.e., unnatural turbidity, color, oil film, floating solids, foams, settleable solids, suspended solids, or deposits) that would cause a violation of the narrative standard or other water quality standards.
- c. **Industrial Storm Water Certified Operator**
Storm water treatment and/or control measures associated with this discharge shall be under the direct supervision of an industrial storm water operator certified by the Department, as required by Section 3110 of the NREPA.
- d. **Implementation of Storm Water Pollution Prevention Plan**
The permittee shall implement an acceptable Storm Water Pollution Prevention Plan (SWPPP) that meets the requirements of this permit.

PART I

Section B. Storm Water Pollution Prevention

2. Storm Water Pollution Prevention Plan (SWPPP)

The SWPPP is a written plan that identifies sources of significant materials associated with industrial activity and includes procedures intended to reduce the exposure of significant materials to storm water. The SWPPP template and other guidance materials are available on the Industrial Storm Water Program webpage at www.michigan.gov/industrialstormwater.

An acceptable SWPPP shall identify the facility name, address, and permit number, and meet the requirements specified in Part I.B.3. through Part I.B.9. below:

3. Source Identification

To identify potential sources of significant materials that have reasonable potential to pollute storm water and subsequently be discharged to surface waters of the state, the SWPPP shall, at a minimum, include the following:

a. Site Map

The site map shall identify and label the following:

- 1) buildings and other permanent structures;
- 2) all areas of industrial activity, industrial equipment, and/or industrial material storage;
- 3) storage, disposal, and/or recycling areas for significant materials;
- 4) the location of all storm water discharge points and monitoring points (numbered or otherwise uniquely labeled for reference);
- 5) the location of all storm water inlets (e.g., catch basins, roof drains, etc.) contributing to each storm water discharge point (numbered or otherwise labeled for reference);
- 6) the location of non-storm water NPDES-permitted discharges;
- 7) the location of all storm water conveyances (e.g., pipe, ditch, channel, etc.) and outlines of the drainage areas contributing to each storm water discharge point;
- 8) all structural controls (e.g., secondary containment, inlet filters, etc.) and/or storm water treatment equipment/devices;
- 9) area(s) of vegetation (with appropriate labelling such as lawn, old field, marsh, wooded, etc.);
- 10) area(s) that have the potential for soil erosion and sediment discharges (e.g., gravel lots, access roads, material stockpiles, outfalls, etc.);
- 11) impervious surfaces (e.g., roofs, asphalt, concrete, etc.);
- 12) name and location of receiving water(s); and
- 13) contaminated areas of the site regulated under Part 201 (Environmental Remediation) of the NREPA.

PART I**Section B. Storm Water Pollution Prevention**

- b. **List of Significant Materials Associated with Industrial Activity**
This list shall identify all significant materials that have a reasonable potential to pollute storm water, and identify the activity or area in which the significant materials are handled or stored. For each activity or area identified, the inlet(s) and discharge point(s) impacted in the event of a spill or leak shall be included on the list. The following industrial activities and/or areas shall be evaluated for the potential to expose significant materials to storm water, as applicable:
- 1) loading, unloading, and other industrial material handling activities;
 - 2) outdoor industrial material storage areas, including secondary containment structures;
 - 3) outdoor manufacturing or processing activities;
 - 4) dust or particulate generating processes/activities;
 - 5) discharges associated with vents, stacks, and air emission controls;
 - 6) industrial waste or recyclable material storage or disposal areas;
 - 7) activities associated with the maintenance and cleaning of vehicles, machines, and equipment;
 - 8) area(s) that have the potential for soil erosion and sediment discharges (e.g., gravel lots, access roads, material stockpiles, outfalls, etc.);
 - 9) areas of contamination regulated under Part 201 (Environmental Remediation) of the NREPA;
 - 10) areas of significant material residues;
 - 11) areas where animals (wild or domestic) congregate and deposit wastes; and
 - 12) other areas where storm water may come into contact with significant materials.
- c. **List of Significant Spills and Leaks**
This list shall identify the date, volume, and location of each significant spill/leak as defined under Part II.A. of this permit, and the cleanup actions undertaken. Significant spills/leaks shall be controlled in accordance with the SWPPP and are cause for the SWPPP to be updated as specified in Part I.B.7. of this permit. The permittee shall notify the Department of significant spills/leaks as specified in Part II.C.6. and/or Part II.C.7. of this permit. Written reports regarding significant spills/leaks shall be retained with the SWPPP records in accordance with Part I.B.10. of this permit.
- d. **Summary of Storm Water Discharge Sampling Data**
If data have been collected, the SWPPP shall include a list of the pollutants detected, sources identified, and the control measures implemented to reduce the discharge of the detected pollutants. Storm water discharge sampling data shall be retained in accordance with Part I.B.10. of this permit.
- e. **Illicit Connection Investigation and Elimination Program**
The permittee shall implement an illicit connection investigation and elimination program. The SWPPP shall include a written description of the actions taken to identify, investigate, and eliminate illicit connections to Municipal Separate Storm Sewer System (MS4) or surface waters of the state. Any discharge from an illicit connection to an MS4 or surface water of the state is a violation of this permit.

PART I**Section B. Storm Water Pollution Prevention**

- f. Description of Dust Suppression Material Used Onsite
The SWPPP shall include a description of the dust suppression material used onsite, the areas where the material is used, and the actions implemented to prevent an unauthorized discharge of the material. If the permittee does not use dust suppression material onsite, the SWPPP shall indicate this.

4. Total Maximum Daily Loads (TMDLs)

The permittee shall implement nonstructural and/or structural controls to reduce the discharge of the pollutant(s) associated with any TMDL(s) identified below. The SWPPP shall include a list of all TMDL(s) identified below, as well as references to control measures already listed in the SWPPP intended to reduce the discharge of the TMDL pollutant(s). The implementation of an acceptable SWPPP shall meet the control measure expectations of all TMDL(s) identified below; however, the Department may require additional control measures if it is determined that the storm water discharge is negatively impacting the applicable TMDL(s). If no TMDLs are identified below, this condition does not apply.

| Name of TMDL | Pollutant of Concern |
|--------------|----------------------|
| NA | NA |

5. Nonstructural Controls

To manage and address sources of significant materials that have reasonable potential to pollute storm water and subsequently be discharged to surface waters of the state, the SWPPP shall, at a minimum, include the following nonstructural controls:

- a. Preventative Maintenance
Preventive maintenance procedures shall list the storm water management and control devices, treatment systems, industrial equipment, etc. that will be routinely serviced and maintained to prevent significant material exposure to storm water. The written procedures shall include a maintenance schedule for each item listed.
- b. Good Housekeeping Inspections
Good housekeeping procedures shall list the areas that will be routinely inspected and cleaned to prevent significant material exposure to storm water. The areas associated with the items listed in the preventative maintenance procedures shall also be included. The written procedures shall include an inspection and cleaning schedule for each area listed. A written report documenting the implementation of the inspection and cleaning schedule shall be retained in accordance with Part I.B.10. of this permit.
- c. Comprehensive Site Inspections
Comprehensive site inspection procedures shall include all items identified in 3) below that will be inspected by an Industrial Storm Water Certified Operator to ensure compliance with this permit. At a minimum, one inspection shall be performed during normal facility operating hours within each of the following quarters unless the Department has approved an alternate schedule in accordance with Part I.B.12. of this permit: January – March, April – June, July – September, and October – December. A written report documenting the comprehensive site inspection shall be retained in accordance with Part I.B.10. of this permit, and shall include the following information:
- 1) the date of the inspection;
 - 2) the Industrial Storm Water Certified Operator's name(s) and certification number(s);

PART I**Section B. Storm Water Pollution Prevention**

3) all observations regarding significant material exposure and any necessary corrective actions related to the inspection of the following:

- a) areas identified in Part I.B.3.a. and Part I.B.3.b. of this permit,
- b) areas identified in Part I.B.3.c. of this permit where significant spills or leaks have occurred in the past three years,
- c) all storm water inlets, conveyances (not including subsurface piping), and discharge points, and
- d) all structural controls and/or storm water treatment equipment/devices;

4) a review of the good housekeeping reports, and any other paperwork associated with the SWPPP; and

5) a written statement, based on the results of the comprehensive site inspection, certifying compliance with the terms of this permit and with the permittee's SWPPP.

d. Visual Assessments

At a minimum, one (1) storm water sample shall be collected for visual assessment during normal facility operating hours at each discharge point within each of the following quarters unless the Department has approved an alternate schedule in accordance with Part I.B.12. of this permit: January – March, April – June, July – September, and October – December. Visual assessment guidance is available on the Industrial Storm Water Program webpage at www.michigan.gov/industrialstormwater.

The following are the requirements of the visual assessments and shall be included in the written procedures:

- 1) The storm water sample(s) shall be collected during normal hours of operation by an Industrial Storm Water Certified Operator, Qualified Personnel as defined in Part II.A. of this permit, or automatic sampling device.
- 2) The storm water sample(s) shall be collected:
 - a) with clean equipment and containers, and
 - b) within the first 30 minutes of the start of a discharge resulting from a qualifying storm event as defined in Part II.A. of this permit. If it is not possible to collect the sample within the first 30 minutes of discharge, the sample shall be collected as soon thereafter as practicable. In the case of snowmelt, samples shall be collected during a period with measurable discharge from the site.
- 3) The visual assessment of the storm water sample(s) shall be performed and documented by an Industrial Storm Water Certified Operator. Documentation shall be retained in accordance with Part I.B.10. of this permit, and shall include the following information:
 - a) Sample location(s).
 - b) Storm water sample collection date(s), time(s), and if applicable, an explanation as to why sample(s) were not collected within the first 30 minutes of discharge.

PART I**Section B. Storm Water Pollution Prevention**

- c) Visual assessment date and time.
 - d) Name and certification number of the Industrial Storm Water Certified Operator.
 - e) Storm event information, including the length of event expressed in hours, approximate size of event expressed in inches of precipitation, duration of time since previous event that caused a discharge, date and time the discharge began, and nature of event (i.e., rainfall or snowmelt).
 - f) Name(s) of personnel who obtained the storm water sample(s) or document that an automatic sampling device was used.
 - g) Any notable observations of the discharge while the storm water samples were collected. This requirement is waived if an automatic sampling device was used to collect the storm water samples.
 - h) Sample(s) shall be observed in a colorless glass or plastic container for the following characteristics: color, oil sheen, turbidity, floating solids, suspended solids, settleable solids, foam, and any other unusual characteristics.
 - i) Unaltered, full-color photograph of the storm water sample(s) against a white background.
 - j) A description of corrective actions taken if any unusual characteristics are identified during the visual assessment.
- 4) When a visual assessment cannot be completed for any reason (e.g., adverse weather conditions, no discharge, qualifying event occurred outside the normal facility operating hours, etc.) during any quarter, written documentation explaining the reason for not completing the visual assessment shall be included with the SWPPP records. Adverse weather conditions are those that are dangerous or create inaccessibility for personnel, such as local flooding, high winds, electrical storms, or situations that otherwise make sampling impractical such as drought or extended frozen conditions.
- 5) If the facility has two (2) or more storm water discharge points that are believed to discharge substantially identical storm water effluents, the facility may conduct visual assessments of the discharge at one (1) of the storm water discharge points and report that the results also apply to the other substantially identical storm water discharge point(s). The determination of substantially identical storm water discharge points is to be based on the significant material evaluation conducted as set forth under Part I.B.3.b. of this permit and shall be clearly documented in the SWPPP. Visual assessments shall be conducted on a rotating basis of each substantially identical storm water discharge point throughout the period of coverage under this permit.
- e. **Material Handling and Spill Prevention / Response Procedures**
Significant material handling and storage procedures shall be developed to minimize the potential for leaks and spills that may be exposed to storm water. For each potential spill or leak area, the procedures shall identify the significant material handling and storage requirements, spill/leak response actions, and locations of spill/leak kits. The SWPPP shall include language describing what a reportable spill or leak is, and the appropriate reporting requirements in accordance with Part II.C.6. and Part II.C.7. of this permit.

PART I

Section B. Storm Water Pollution Prevention

For Polluting Materials as defined under Part II.A. of this permit, the SWPPP may reference any of the following plans:

- Pollution Incident Prevention Plan (PIPP) prepared in accordance with the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code)
 - Hazardous Waste Contingency Plan prepared in accordance with 40 CFR 264 and 265 Subpart D, as required by Part 111 of the NREPA
 - Spill Prevention Control and Countermeasure (SPCC) plan prepared in accordance with 40 CFR 112
- f. Annual Employee Training Program
The SWPPP shall include a written description of the employee training program that will be implemented on an annual basis to inform appropriate personnel of the components of the SWPPP and requirements of this permit. Records of the annual employee training program shall be retained in accordance with Part I.B.10. of this permit.

6. Structural Controls

Structural controls shall be used to reduce significant material exposure and/or the concentration of significant materials in the discharge to ensure compliance with Part I.B.1.a. and Part I.B.1.b. of this permit. The SWPPP shall provide a list of all structural controls utilized onsite and the significant material(s) intended to be managed by the structural controls. The location of the structural controls shall be identified on the site map. Where applicable, structural controls shall, at a minimum, be utilized to achieve the following:

- a. prevent unauthorized discharges from industrial waste and recyclable material containers,
- b. prevent the discharge of sediment and other particulates that can be mobilized by storm water, and
- c. minimize channel/streambank erosion and scour in the immediate vicinity of outfalls.

7. Keeping SWPPPs Current

- a. The permittee and/or an Industrial Storm Water Certified Operator shall review the SWPPP annually after it is developed and maintain a written report of the review. Based on the review, the permittee or an Industrial Storm Water Certified Operator shall amend the SWPPP as needed to ensure continued compliance with the terms and conditions of this permit. A SWPPP Annual Review Report form is available on the Industrial Storm Water Program webpage at www.michigan.gov/industrialstormwater. The written report of the SWPPP Annual Review shall be retained in accordance with Part I.B.10. of this permit.
- b. The SWPPP developed under the conditions of a previous permit shall be amended as necessary to ensure compliance with this permit.

PERMIT NO. MI0001457

Page 27 of 48

PART I

Section B. Storm Water Pollution Prevention

- c. The SWPPP shall be updated or amended whenever changes at the facility have the potential to increase the exposure of significant materials to storm water, significant spills/leaks occur at the facility, or when the SWPPP is determined by the permittee or the Department to be ineffective in achieving the general objectives of controlling pollutants in storm water discharges associated with industrial activity. SWPPP updates necessitated by increased activity or significant spills at the facility shall include a description of how the permittee intends to control any new sources of significant materials or respond to and prevent spills in accordance with the requirements of this permit.
- d. The Department may notify the permittee at any time that the SWPPP does not meet minimum requirements of this permit. Such notification shall identify why the SWPPP does not meet minimum requirements of this permit. The permittee shall make the required changes to the SWPPP within 30 days after such notification from the Department and shall submit to the Department a written certification that the requested changes have been made.
- e. Amendments to the SWPPP shall be signed and retained on-site with the SWPPP pursuant to Part I.B.9. of this permit.

8. Contact Information and Industrial Storm Water Certified Operator Update

- a. The SWPPP shall include contact information (i.e., name, mailing address, phone number, and email address) for the Facility Contact, Industrial Storm Water Certified Operator(s), environmental consultant, and/or any other appropriate individuals who manage the storm water program at the facility. The SWPPP shall be updated, as necessary, to ensure the contact information is current.
- b. If the primary Industrial Storm Water Certified Operator is replaced, the permittee shall provide the name and certification number of the new Industrial Storm Water Certified Operator to the Department by updating the facility's MiEnviro Portal site. If a facility has multiple Industrial Storm Water Certified Operators, the names and certification numbers of all shall be included in the SWPPP.

9. Signature and SWPPP Certification

- a. The SWPPP shall be reviewed and signed by an Industrial Storm Water Certified Operator and by either the permittee or an authorized representative in accordance with 40 CFR 122.22. The SWPPP and associated records shall be retained on-site at the facility that generates the storm water discharge.
- b. The permittee shall make the SWPPP and items required by Part I.B.10. of this permit available upon request to the Department. The Department makes the non-confidential business portions of the SWPPP available to the public.

10. Record Keeping

The permittee shall maintain records of all SWPPP-related activities. All such records shall be retained for three (3) years. The following records are required by this permit:

- a. good housekeeping inspection reports
- b. comprehensive site inspection reports

PART I**Section B. Storm Water Pollution Prevention**

- c. visual assessment reports
- d. employee training records
- e. SWPPP annual review reports
- f. significant spill/leak reports, and
- g. storm water discharge sampling data.

11. Non-Storm Water Discharges

Storm water is defined in Part II.A. of this permit to encompass non-storm water discharges included under the conditions of this permit. Any discharge of wastewater other than storm water as defined under the conditions of this permit shall be in compliance with an NPDES permit issued for the discharge. The non-storm water discharges included under the conditions of this permit are authorized under this permit, provided pollution prevention controls for the non-storm water component are identified in the permittee's SWPPP. The non-storm water discharges included under the conditions of this permit are as follows:

- a. discharges from fire hydrant flushing
- b. potable water sources, including water line flushing
- c. water from fire system testing and fire-fighting training without burned materials or chemical fire suppressants
- d. irrigation drainage
- e. lawn watering
- f. routine building wash-down that does not use detergents or other compounds
- g. pavement wash waters where contamination by toxic or hazardous materials has not occurred (unless all contamination by toxic or hazardous materials has been removed) and where detergents are not used
- h. uncontaminated condensate from air conditioners, coolers, and other compressors and from the outside storage of refrigerated gases or liquids
- i. springs
- j. uncontaminated groundwater
- k. foundation or footing drains where flows are not contaminated with process materials such as solvents, and
- l. discharges from fire-fighting activities. Discharges from fire-fighting activities are exempted from the requirement to be identified in the SWPPP.

PART I**Section B. Storm Water Pollution Prevention****12. Alternate Schedule Request for Comprehensive Site Inspections and/or Visual Assessment**

The permittee may request Department approval of an alternate schedule for comprehensive site inspections and/or visual assessments. Such a request may be made if the permittee meets the following criteria: the permittee is in full compliance with this permit, the permittee has an acceptable SWPPP, the permittee has installed and/or implemented adequate structural controls at the facility, the permittee has all required inspection reports available at the facility, and the permittee has an Industrial Storm Water Certified Operator at the facility. The Department may revoke the approval of an alternate schedule at any time upon notification to the permittee if these criteria are not being met.

13. Tracer Dye Discharges

This permit does not authorize the discharge of tracer dyes without approval from the Department. Requests to discharge tracer dyes shall be submitted to the Department in accordance with Rule 1097 (R 323.1097 of the Michigan Administrative Code).

PART II

Part II may include terms and /or conditions not applicable to discharges covered under this permit.

Section A. Definitions

Acute toxic unit (TU_A) means 100/LC₅₀ where the LC₅₀ is determined from a whole effluent toxicity (WET) test which produces a result that is statistically or graphically estimated to be lethal to 50% of the test organisms.

Annual monitoring frequency refers to a calendar year beginning on January 1 and ending on December 31. When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

Authorized public agency means a state, local, or county agency that is designated pursuant to the provisions of Section 9110 of Part 91, Soil and Sedimentation Control, of the NREPA, to implement soil erosion and sedimentation control requirements with regard to construction activities undertaken by that agency.

Best management practices (BMPs) means structural devices or nonstructural practices that are designed to prevent pollutants from entering into storm water, to direct the flow of storm water, or to treat polluted storm water.

Bioaccumulative chemical of concern (BCC) means a chemical which, upon entering the surface waters, by itself or as its toxic transformation product, accumulates in aquatic organisms by a human health bioaccumulation factor of more than 1000 after considering metabolism and other physiochemical properties that might enhance or inhibit bioaccumulation. The human health bioaccumulation factor shall be derived according to R 323.1057(5). Chemicals with half-lives of less than 8 weeks in the water column, sediment, and biota are not BCCs. The minimum bioaccumulation concentration factor (BAF) information needed to define an organic chemical as a BCC is either a field-measured BAF or a BAF derived using the biota-sediment accumulation factor (BSAF) methodology. The minimum BAF information needed to define an inorganic chemical as a BCC, including an organometal, is either a field-measured BAF or a laboratory-measured bioconcentration factor (BCF). The BCCs to which these rules apply are identified in Table 5 of R 323.1057 of the Water Quality Standards.

Biosolids are the solid, semisolid, or liquid residues generated during the treatment of sanitary sewage or domestic sewage in a treatment works. This includes, but is not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment processes and a derivative of the removed scum or solids.

Bulk biosolids means biosolids that are not sold or given away in a bag or other container for application to a lawn or home garden.

CAFO means concentrated animal feeding operation.

Certificate of Coverage (COC) is a document, issued by the Department, which authorizes a discharge under a general permit.

Chronic toxic unit (TUC) means 100/MATC or 100/IC25, where the maximum acceptable toxicant concentration (MATC) and IC25 are expressed as a percent effluent in the test medium.

Class B biosolids refers to material that has met the Class B pathogen reduction requirements or equivalent treatment by a Process to Significantly Reduce Pathogens (PSRP) in accordance with the Part 24 Rules, Land Application of Biosolids, promulgated under Part 31 of the NREPA. Processes include aerobic digestion, composting, anaerobic digestion, lime stabilization and air drying.

Combined sewer system is a sewer system in which storm water runoff is combined with sanitary wastes.

PART II

Section A. Definitions

Composite sample is a sample collected over time, either by continuous sampling or by mixing discrete samples. A composite sample represents the average wastewater characteristics present during the compositing period. Various methods for compositing are available and are based on either time or flow-proportioning, the choice of which will depend on the permit requirements.

Continuous monitoring refers to sampling/readings that occur at regular and consistent intervals throughout a 24-hour period and at a frequency sufficient to capture data that are representative of the discharge. The maximum acceptable interval between samples/readings shall be one (1) hour.

Daily concentration

FOR PARAMETERS OTHER THAN pH, DISSOLVED OXYGEN, TEMPERATURE, AND CONDUCTIVITY – Daily concentration is the sum of the concentrations of the individual samples of a parameter taken within a calendar day divided by the number of samples taken within that calendar day. The daily concentration will be used to determine compliance with any maximum and minimum daily concentration limitations. For guidance and examples showing how to report and perform calculations using results below quantification levels, see the document entitled “Reporting Results Below Quantification,” available at <https://www.michigan.gov/-/media/Project/Websites/egle/Documents/Programs/WRD/MiEnviro/results-below-quantification.pdf>.

FOR pH, DISSOLVED OXYGEN, TEMPERATURE, AND CONDUCTIVITY – The daily concentration used to determine compliance with maximum daily pH, temperature, and conductivity limitations is the highest pH, temperature, and conductivity readings obtained within a calendar day. The daily concentration used to determine compliance with minimum daily pH and dissolved oxygen limitations is the lowest pH and dissolved oxygen readings obtained within a calendar day.

Daily loading is the total discharge by weight of a parameter discharged during any calendar day. This value is calculated by multiplying the daily concentration by the total daily flow and by the appropriate conversion factor. The daily loading will be used to determine compliance with any maximum daily loading limitations. When required by the permit, report the maximum calculated daily loading for the month in the “MAXIMUM” column under “QUANTITY OR LOADING” on the DMRs.

Daily monitoring frequency refers to a 24-hour day. When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

Department means the Michigan Department of Environment, Great Lakes, and Energy.

Detection level means the lowest concentration or amount of the target analyte that can be determined to be different from zero by a single measurement at a stated level of probability.

Discharge means the addition of any waste, waste effluent, wastewater, pollutant, or any combination thereof to any surface water of the state.

EC₅₀ means a statistically or graphically estimated concentration that is expected to cause 1 or more specified effects in 50% of a group of organisms under specified conditions.

PART II

Section A. Definitions

Fecal coliform bacteria monthly

FOR WWSLs THAT COLLECT AND STORE WASTEWATER AND ARE AUTHORIZED TO DISCHARGE ONLY IN THE SPRING AND/OR FALL ON AN INTERMITTENT BASIS – Fecal coliform bacteria monthly is the geometric mean of all daily concentrations determined during a discharge event. Days on which no daily concentration is determined shall not be used to determine the calculated monthly value. The calculated monthly value will be used to determine compliance with the maximum monthly fecal coliform bacteria limitations. When required by the permit, report the calculated monthly value in the “AVERAGE” column under “QUALITY OR CONCENTRATION” on the DMR. If the period in which the discharge event occurred was partially in each of two months, the calculated monthly value shall be reported on the DMR of the month in which the last day of discharge occurred.

FOR ALL OTHER DISCHARGES – Fecal coliform bacteria monthly is the geometric mean of all daily concentrations determined during a reporting month. Days on which no daily concentration is determined shall not be used to determine the calculated monthly value. The calculated monthly value will be used to determine compliance with the maximum monthly fecal coliform bacteria limitations. When required by the permit, report the calculated monthly value in the “AVERAGE” column under “QUALITY OR CONCENTRATION” on the DMR.

Fecal coliform bacteria 7-day

FOR WWSLs THAT COLLECT AND STORE WASTEWATER AND ARE AUTHORIZED TO DISCHARGE ONLY IN THE SPRING AND/OR FALL ON AN INTERMITTENT BASIS – Fecal coliform bacteria 7-day is the geometric mean of the daily concentrations determined during any 7 consecutive days of discharge during a discharge event. If the number of daily concentrations determined during the discharge event is less than 7 days, the number of actual daily concentrations determined shall be used for the calculation. Days on which no daily concentration is determined shall not be used to determine the value. The calculated 7-day value will be used to determine compliance with the maximum 7-day fecal coliform bacteria limitations. When required by the permit, report the maximum calculated 7-day geometric mean value for the month in the “MAXIMUM” column under “QUALITY OR CONCENTRATION” on the DMRs. If the 7-day period was partially in each of two months, the value shall be reported on the DMR of the month in which the last day of discharge occurred.

FOR ALL OTHER DISCHARGES – Fecal coliform bacteria 7-day is the geometric mean of the daily concentrations determined during any 7 consecutive days in a reporting month. If the number of daily concentrations determined is less than 7, the actual number of daily concentrations determined shall be used for the calculation. Days on which no daily concentration is determined shall not be used to determine the value. The calculated 7-day value will be used to determine compliance with the maximum 7-day fecal coliform bacteria limitations. When required by the permit, report the maximum calculated 7-day geometric mean for the month in the “MAXIMUM” column under “QUALITY OR CONCENTRATION” on the DMRs. The first calculation shall be made on day 7 of the reporting month, and the last calculation shall be made on the last day of the reporting month.

Flow-proportioned composite sample is a composite sample in which either a) the volume of each portion of the composite is proportional to the effluent flow rate at the time that portion is obtained; or b) a constant sample volume is obtained at varying time intervals proportional to the effluent flow rate.

General permit means an NPDES permit authorizing a category of similar discharges.

Geometric mean is the average of the logarithmic values of a base 10 data set, converted back to a base 10 number.

Grab sample is a single sample taken at neither a set time nor flow.

IC₂₅ means the toxicant concentration that would cause a 25% reduction in a nonquantal biological measurement for the test population.

PART II

Section A. Definitions

Illicit connection means a physical connection to a municipal separate storm sewer system that primarily conveys non-storm water discharges other than uncontaminated groundwater into the storm sewer; or a physical connection not authorized or permitted by the local authority, where a local authority requires authorization or a permit for physical connections.

Illicit discharge means any discharge to, or seepage into, a municipal separate storm sewer system that is not composed entirely of storm water or uncontaminated groundwater. Illicit discharges include non-storm water discharges through pipes or other physical connections; dumping of motor vehicle fluids, household hazardous wastes, domestic animal wastes, or litter; collection and intentional dumping of grass clippings or leaf litter; or unauthorized discharges of sewage, industrial waste, restaurant wastes, or any other non-storm water waste directly into a separate storm sewer.

Individual permit means a site-specific NPDES permit.

Inlet means a catch basin, roof drain, conduit, drain tile, retention pond riser pipe, sump pump, or other point where storm water or wastewater enters into a closed conveyance system prior to discharge off site or into waters of the state.

Interference is a discharge which, alone or in conjunction with a discharge or discharges from other sources, both: 1) inhibits or disrupts a POTW, its treatment processes or operations, or its sludge processes, use or disposal; and 2) therefore, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or, of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent state or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including Title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including state regulations contained in any state sludge management plan prepared pursuant to Subtitle D of the SWDA), the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act. [This definition does not apply to sample matrix interference].

Land application means spraying or spreading biosolids or a biosolids derivative onto the land surface, injecting below the land surface, or incorporating into the soil so that the biosolids or biosolids derivative can either condition the soil or fertilize crops or vegetation grown in the soil.

LC₅₀ means a statistically or graphically estimated concentration that is expected to be lethal to 50% of a group of organisms under specified conditions.

Maximum acceptable toxicant concentration (MATC) means the concentration obtained by calculating the geometric mean of the lower and upper chronic limits from a chronic test. A lower chronic limit is the highest tested concentration that did not cause the occurrence of a specific adverse effect. An upper chronic limit is the lowest tested concentration which did cause the occurrence of a specific adverse effect and above which all tested concentrations caused such an occurrence.

Maximum extent practicable means implementation of best management practices by a public body to comply with an approved storm water management program as required by a national permit for a municipal separate storm sewer system, in a manner that is environmentally beneficial, technically feasible, and within the public body's legal authority.

MBTU/hr means million British Thermal Units per hour.

MGD means million gallons per day.

PART II

Section A. Definitions

Monthly concentration is the sum of the daily concentrations determined during a reporting period divided by the number of daily concentrations determined. The calculated monthly concentration will be used to determine compliance with any maximum monthly concentration limitations. Days with no discharge shall not be used to determine the value. When required by the permit, report the calculated monthly concentration in the "AVERAGE" column under "QUALITY OR CONCENTRATION" on the DMR.

For minimum percent removal requirements, the monthly influent concentration and the monthly effluent concentration shall be determined. The calculated monthly percent removal, which is equal to 100 times the quantity [1 minus the quantity (monthly effluent concentration divided by the monthly influent concentration)], shall be reported in the "MINIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs.

Monthly loading is the sum of the daily loadings of a parameter divided by the number of daily loadings determined during a reporting period. The calculated monthly loading will be used to determine compliance with any maximum monthly loading limitations. Days with no discharge shall not be used to determine the value. When required by the permit, report the calculated monthly loading in the "AVERAGE" column under "QUANTITY OR LOADING" on the DMR.

Monthly monitoring frequency refers to a calendar month. When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

Municipal separate storm sewer means a conveyance or system of conveyances designed or used for collecting or conveying storm water which is not a combined sewer and which is not part of a POTW as defined in the Code of Federal Regulations at 40 CFR 122.2.

Municipal separate storm sewer system (MS4) means all separate storm sewers that are owned or operated by the United States, a state, city, village, township, county, district, association, or other public body created by or pursuant to state law, having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under state law, such as a sewer district, flood control district, or drainage district, or similar entity, or a designated or approved management agency under Section 208 of the Clean Water Act that discharges to the waters of the state. This term includes systems similar to separate storm sewer systems in municipalities, such as systems at military bases, large hospital or prison complexes, and highways and other thoroughfares. The term does not include separate storm sewers in very discrete areas, such as individual buildings.

National Pretreatment Standards are the regulations promulgated by or to be promulgated by the Federal Environmental Protection Agency pursuant to Section 307(b) and (c) of the Clean Water Act. The standards establish nationwide limits for specific industrial categories for discharge to a POTW.

No observed adverse effect level (NOAEL) means the highest tested dose or concentration of a substance which results in no observed adverse effect in exposed test organisms where higher doses or concentrations result in an adverse effect.

Noncontact cooling water is water used for cooling which does not come into direct contact with any raw material, intermediate product, by-product, waste product or finished product.

Nondomestic user is any discharger to a POTW that discharges wastes other than or in addition to water-carried wastes from toilet, kitchen, laundry, bathing or other facilities used for household purposes.

Nonstructural controls are practices or procedures implemented by employees at a facility to manage storm water or to prevent contamination of storm water.

NPDES means National Pollutant Discharge Elimination System.

Outfall is the location at which a point source discharge first enters a surface water of the state.

PART II

Section A. Definitions

Part 91 agency means an agency that is designated by a county board of commissioners pursuant to the provisions of Section 9105 of Part 91 of the NREPA; an agency that is designated by a city, village, or township in accordance with the provisions of Section 9106 of Part 91 of the NREPA; or the Department for soil erosion and sedimentation control activities under Part 615, Supervisor of Wells; Part 631, Reclamation of Mining Lands; or Part 632, Nonferrous Metallic Mineral Mining, of the NREPA, pursuant to the provisions of Section 9115 of Part 91 of the NREPA.

Part 91 permit means a soil erosion and sedimentation control permit issued by a Part 91 agency pursuant to the provisions of Part 91 of the NREPA.

Partially treated sewage is any sewage, sewage and storm water, or sewage and wastewater, from domestic or industrial sources that is treated to a level less than that required by the permittee's NPDES permit, or that is not treated to national secondary treatment standards for wastewater, including discharges to surface waters from retention treatment facilities.

PFAS means perfluoroalkyl and polyfluoroalkyl substances.

Point of discharge is the location of a point source discharge where storm water is discharged directly into a separate storm sewer system.

Point source discharge means a discharge from any discernible, confined, discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, or rolling stock. Changing the surface of land or establishing grading patterns on land will result in a point source discharge where the runoff from the site is ultimately discharged to waters of the state.

Polluting material means any material, in solid or liquid form, identified as a polluting material under the Part 5 Rules, Spillage of Oil and Polluting Materials, promulgated under Part 31 of the NREPA (R 324.2001 through R 324.2009 of the Michigan Administrative Code).

POTW is a publicly owned treatment work.

Predevelopment is the last land use prior to the planned new development or redevelopment.

Pretreatment is reducing the amount of pollutants, eliminating pollutants, or altering the nature of pollutant properties to a less harmful state prior to discharge into a public sewer. The reduction or alteration can be by physical, chemical, or biological processes, process changes, or by other means. Dilution is not considered pretreatment unless expressly authorized by an applicable National Pretreatment Standard for a particular industrial category.

Public (as used in the MS4 individual permit) means all persons who potentially could affect the authorized storm water discharges, including, but not limited to, residents, visitors to the area, public employees, businesses, industries, and construction contractors and developers.

Public body means the United States; the state of Michigan; a city, village, township, county, school district, public college or university, or single-purpose governmental agency; or any other body which is created by federal or state statute or law.

Qualified Personnel means an individual who meets qualifications acceptable to the Department and who is authorized by an Industrial Storm Water Certified Operator to collect the storm water sample.

Qualifying storm event means a storm event causing greater than 0.1 inch of rainfall and occurring at least 72 hours after the previous measurable storm event that also caused greater than 0.1 inch of rainfall. Upon request, the Department may approve an alternate definition meeting the condition of a qualifying storm event.

PART II

Section A. Definitions

Quantification level means the measurement of the concentration of a contaminant obtained by using a specified laboratory procedure calculated at a specified concentration above the detection level. It is considered the lowest concentration at which a particular contaminant can be quantitatively measured using a specified laboratory procedure for monitoring of the contaminant.

Quarterly monitoring frequency refers to a three-month period, defined as January through March, April through June, July through September, and October through December (or otherwise defined in the permit). When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

Regional Administrator is the Region 5 Administrator, U.S. EPA, located at R-19J, 77 W. Jackson Blvd., Chicago, Illinois 60604.

Regulated area means the permittee's urbanized area, where urbanized area is defined as a place and its adjacent densely populated territory that together have a minimum population of 50,000 people as defined by the United States Bureau of the Census and as determined by the latest available decennial census.

Secondary containment structure means a unit, other than the primary container, in which significant materials are packaged or held, which is required by state or federal law to prevent the escape of significant materials by gravity into sewers, drains, or otherwise directly or indirectly into any sewer system or to the surface waters or groundwaters of the state.

Separate storm sewer system means a system of drainage, including, but not limited to, roads, catch basins, curbs, gutters, parking lots, ditches, conduits, pumping devices, or man-made channels, which is not a combined sewer where storm water mixes with sanitary wastes, and is not part of a POTW.

Significant industrial user is a nondomestic user that: 1) is subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N; or 2) discharges an average of 25,000 gallons per day or more of process wastewater to a POTW (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process waste stream which makes up five (5) percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the permittee as defined in 40 CFR 403.12(a) on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's treatment plant operation or violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Significant materials means any material which could degrade or impair water quality, including but not limited to: raw materials; fuels; solvents, detergents, and plastic pellets; finished materials such as metallic products; hazardous substances designated under Section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (see 40 CFR 372.65); any chemical the facility is required to report pursuant to Section 313 of Emergency Planning and Community Right-to-Know Act (EPCRA); polluting materials as identified under the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code); Hazardous Wastes as defined in Part 111, Hazardous Waste Management, of the NREPA; fertilizers; pesticides; and waste products such as ashes, slag, and sludge that have the potential to be released with storm water discharges.

Significant spills and significant leaks means any release of a polluting material reportable under the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code).

Special-use area means storm water discharges for which the Department has determined that additional monitoring is needed from: secondary containment structures required by state or federal law; lands on Michigan's List of Sites of Environmental Contamination pursuant to Part 201, Environmental Remediation, of the NREPA; and/or areas with other activities that may contribute pollutants to the storm water.

PART II

Section A. Definitions

Stoichiometric means the quantity of a reagent calculated to be necessary and sufficient for a given chemical reaction.

Storm water means storm water runoff, snow melt runoff, surface runoff and drainage, and non-storm water included under the conditions of this permit.

Storm water discharge point is the location where the point source discharge of storm water is directed to surface waters of the state or to a separate storm sewer. It includes the location of all point source discharges where storm water exits the facility, including outfalls which discharge directly to surface waters of the state, and points of discharge which discharge directly into separate storm sewer systems.

Structural controls are physical features or structures used at a facility to manage or treat storm water.

SWPPP means the Storm Water Pollution Prevention Plan prepared in accordance with this permit.

Tier I value means a value for aquatic life, human health or wildlife calculated under R 323.1057 of the Water Quality Standards using a tier I toxicity database.

Tier II value means a value for aquatic life, human health or wildlife calculated under R 323.1057 of the Water Quality Standards using a tier II toxicity database.

Total maximum daily loads (TMDLs) are required by the Clean Water Act for waterbodies that do not meet water quality standards. TMDLs represent the maximum daily load of a pollutant that a waterbody can assimilate and meet water quality standards, and an allocation of that load among point sources, nonpoint sources, and a margin of safety.

Toxicity reduction evaluation (TRE) means a site-specific study conducted in a stepwise process designed to identify the causative agents of effluent toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in effluent toxicity.

Water Quality Standards means the Part 4 Water Quality Standards promulgated pursuant to Part 31 of the NREPA, being R 323.1041 through R 323.1117 of the Michigan Administrative Code.

Weekly monitoring frequency refers to a calendar week which begins on Sunday and ends on Saturday. When required by this permit, an analytical result, reading, value, or observation shall be reported for that period if a discharge occurs during that period. If the calendar week begins in one month and ends in the following month, the analytical result, reading, value, or observation shall be reported in the month in which monitoring was conducted.

WWSL is a wastewater stabilization lagoon.

WWSL discharge event is a discrete occurrence during which effluent is discharged to the surface water up to 10 days of a consecutive 14-day period.

3-portion composite sample is a sample consisting of three equal-volume grab samples collected at equal intervals over an 8-hour period.

PART II

Section A. Definitions

7-day concentration

FOR WWSLs THAT COLLECT AND STORE WASTEWATER AND ARE AUTHORIZED TO DISCHARGE ONLY IN THE SPRING AND/OR FALL ON AN INTERMITTENT BASIS – The 7-day concentration is the sum of the daily concentrations determined during any 7 consecutive days of discharge during a WWSL discharge event divided by the number of daily concentrations determined. If the number of daily concentrations determined during the WWSL discharge event is less than 7 days, the number of actual daily concentrations determined shall be used for the calculation. The calculated 7-day concentration will be used to determine compliance with any maximum 7-day concentration limitations. When required by the permit, report the maximum calculated 7-day concentration for the WWSL discharge event in the “MAXIMUM” column under “QUALITY OR CONCENTRATION” on the DMR. If the WWSL discharge event was partially in each of two months, the value shall be reported on the DMR of the month in which the last day of discharge occurred.

FOR ALL OTHER DISCHARGES – The 7-day concentration is the sum of the daily concentrations determined during any 7 consecutive days in a reporting month divided by the number of daily concentrations determined. If the number of daily concentrations determined is less than 7, the actual number of daily concentrations determined shall be used for the calculation. The calculated 7-day concentration will be used to determine compliance with any maximum 7-day concentration limitations in the reporting month. When required by the permit, report the maximum calculated 7-day concentration for the month in the “MAXIMUM” column under “QUALITY OR CONCENTRATION” on the DMR. The first 7-day calculation shall be made on day 7 of the reporting month, and the last calculation shall be made on the last day of the reporting month.

7-day loading

FOR WWSLs THAT COLLECT AND STORE WASTEWATER AND ARE AUTHORIZED TO DISCHARGE ONLY IN THE SPRING AND/OR FALL ON AN INTERMITTENT BASIS – The 7-day loading is the sum of the daily loadings determined during any 7 consecutive days of discharge during a WWSL discharge event divided by the number of daily loadings determined. If the number of daily loadings determined during the WWSL discharge event is less than 7 days, the number of actual daily loadings determined shall be used for the calculation. The calculated 7-day loading will be used to determine compliance with any maximum 7-day loading limitations. When required by the permit, report the maximum calculated 7-day loading for the WWSL discharge event in the “MAXIMUM” column under “QUANTITY OR LOADING” on the DMR. If the WWSL discharge event was partially in each of two months, the value shall be reported on the DMR of the month in which the last day of discharge occurred.

FOR ALL OTHER DISCHARGES – The 7-day loading is the sum of the daily loadings determined during any 7 consecutive days in a reporting month divided by the number of daily loadings determined. If the number of daily loadings determined is less than 7, the actual number of daily loadings determined shall be used for the calculation. The calculated 7-day loading will be used to determine compliance with any maximum 7-day loading limitations in the reporting month. When required by the permit, report the maximum calculated 7-day loading for the month in the “MAXIMUM” column under “QUANTITY OR LOADING” on the DMR. The first 7-day calculation shall be made on day 7 of the reporting month, and the last calculation shall be made on the last day of the reporting month.

24-hour composite sample is a flow-proportioned composite sample consisting of hourly or more frequent portions that are taken over a 24-hour period and in which the volume of each portion is proportional to the discharge flow rate at the time that portion is taken. A time-proportioned composite sample may be used upon approval from the Department if the permittee demonstrates it is representative of the discharge.

PART II

Section B. Monitoring Procedures

1. Representative Samples

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

2. Test Procedures

Test procedures for the analysis of pollutants shall conform to regulations promulgated pursuant to Section 304(h) of the Clean Water Act (40 CFR Part 136 – Guidelines Establishing Test Procedures for the Analysis of Pollutants), unless specified otherwise in this permit. **Test procedures used shall be sufficiently sensitive to determine compliance with applicable effluent limitations.** For lists of approved test methods, go to <https://www.epa.gov/cwa-methods>. Requests to use test procedures not promulgated under 40 CFR Part 136 for pollutant monitoring required by this permit shall be made in accordance with the Alternate Test Procedures regulations specified in 40 CFR 136.4. These requests shall be submitted to the Manager of the Permits Section, Water Resources Division, Michigan Department of Environment, Great Lakes, and Energy, P.O. Box 30458, Lansing, Michigan, 48909-7958. The permittee may use such procedures upon approval.

The permittee shall periodically calibrate and perform maintenance procedures on all analytical instrumentation at intervals to ensure accuracy of measurements. The calibration and maintenance shall be performed as part of the permittee's laboratory Quality Assurance/Quality Control program.

3. Instrumentation

The permittee shall periodically calibrate and perform maintenance procedures on all monitoring instrumentation at intervals to ensure accuracy of measurements.

4. Recording Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information: 1) the exact place, date, and time of measurement or sampling; 2) the person(s) who performed the measurement or sample collection; 3) the dates the analyses were performed; 4) the person(s) who performed the analyses; 5) the analytical techniques or methods used; 6) the date of and person responsible for equipment calibration; and 7) the results of all required analyses.

5. Records Retention

All records and information resulting from the monitoring activities required by this permit, including all records of analyses performed, calibration and maintenance of instrumentation, and recordings from continuous monitoring instrumentation, shall be retained for a minimum of three (3) years, or longer if requested by the Regional Administrator or the Department.

PART II

Section C. Reporting Requirements

1. Start-Up Notification

The permittee shall notify the Department of start-up if one of the following conditions applies and in accordance with the applicable condition:

a. Non-CAFOs

1) **If this is an individual permit** and the permittee will not discharge during the first 60 days following the effective date of this permit, the permittee shall notify the Department via MiEnviro Portal within 14 days following the effective date of this permit, and then again 60 days prior to commencement of the discharge.

2) **If this is a general permit** and the permittee will not discharge during the first 60 days following the effective date of the Certificate of Coverage (COC) issued under this general permit, the permittee shall notify the Department via MiEnviro Portal within 14 days following the effective date of the COC, and then again 60 days prior to commencement of the discharge.

b. CAFOs

1) **If this is an individual permit** and the permittee will not populate with animals during the first 60 days following the effective date of this permit, the permittee shall notify the Department via MiEnviro Portal within 14 days following the effective date of this permit, and then again 60 days prior to populating with animals.

2) **If this is a general permit** and the permittee will not populate with animals during 60 days following the effective date of the Certificate of Coverage (COC) issued under this general permit, the permittee shall notify the Department via MiEnviro Portal within 14 days following the effective date of the COC, and then again 60 days prior to populating with animals.

2. Submittal Requirements for Self-Monitoring Data

Part 31 of the NREPA (specifically Section 324.3110(7)); and R 323.2155(2) of Part 21, Wastewater Discharge Permits, promulgated under Part 31 of the NREPA, allow the Department to specify the forms to be utilized for reporting the required self-monitoring data. Unless instructed on the effluent limitations page to conduct "Retained Self-Monitoring," the permittee shall submit self-monitoring data via the Department's MiEnviro Portal system.

The permittee shall utilize the information provided on the MiEnviro Portal website, located at <https://mienviro.michigan.gov/ncore/>, to access and submit the electronic forms. Both monthly summary and daily data shall be submitted to the Department no later than the 20th day of the month following each month of the authorized discharge period(s). The permittee may be allowed to submit the electronic forms after this date if the Department has granted an extension to the submittal date.

3. Retained Self-Monitoring Requirements

If instructed on the effluent limits page (or otherwise authorized by the Department in accordance with the provisions of this permit) to conduct retained self-monitoring, the permittee shall maintain a year-to-date log of retained self-monitoring results and, upon request, provide such log for inspection to the staff of the Department. Retained self-monitoring results are public information and shall be promptly provided to the public upon request.

PART II

Section C. Reporting Requirements

The permittee shall certify, in writing, to the Department, on or before January 10 (April 1 for animal feeding operation facilities) of each year, that: 1) all retained self-monitoring requirements have been complied with and a year-to-date log has been maintained; and 2) the application on which this permit is based still accurately describes the discharge. With this annual certification, the permittee shall submit a summary of the previous year's monitoring data. The summary shall include maximum values for samples to be reported as daily maximums and/or monthly maximums and minimum values for any daily minimum samples.

Retained self-monitoring may be denied to a permittee by notification in writing from the Department. In such cases, the permittee shall submit self-monitoring data in accordance with Part II.C.2., above. Such a denial may be rescinded by the Department upon written notification to the permittee. Reissuance or modification of this permit or reissuance or modification of an individual permittee's authorization to discharge shall not affect previous approval or denial for retained self-monitoring unless the Department provides notification in writing to the permittee.

4. Additional Monitoring by Permittee

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report. Such increased frequency shall also be indicated.

Monitoring required pursuant to Part 41 of the NREPA or Rule 35 of the Mobile Home Park Commission Act, 1987 PA 96, as amended, for assurance of proper facility operation, shall be submitted as required by the Department.

5. Compliance Dates Notification

Within 14 days of every compliance date specified in this permit, the permittee shall submit a written notification to the Department via MiEnviro Portal (<https://mienviro.michigan.gov/ncore/>) indicating whether or not the particular requirement was accomplished. If the requirement was not accomplished, the notification shall include an explanation of the failure to accomplish the requirement, actions taken or planned by the permittee to correct the situation, and an estimate of when the requirement will be accomplished. If a written report is required to be submitted by a specified date and the permittee accomplishes this, a separate written notification is not required.

6. Noncompliance Notification

Compliance with all applicable requirements set forth in the Clean Water Act, Parts 31 and 41 of the NREPA, and related regulations and rules is required. All instances of noncompliance shall be reported as follows:

- a. **24-Hour Reporting**
Any noncompliance which may endanger health or the environment (including maximum and/or minimum daily concentration discharge limitation exceedances) shall be reported, verbally, within 24 hours from the time the permittee becomes aware of the noncompliance by calling the Department at the number indicated on the second page of this permit (or, if this is a general permit, on the COC). A written submission shall also be provided via MiEnviro Portal (<https://mienviro.michigan.gov/ncore/>) within five (5) days.
- b. **Other Reporting**
The permittee shall report, in writing via MiEnviro Portal (<https://mienviro.michigan.gov/ncore/>), all other instances of noncompliance not described in a. above at the time monitoring reports are submitted; or, in the case of retained self-monitoring, within five (5) days from the time the permittee becomes aware of the noncompliance.

PART II

Section C. Reporting Requirements

Reporting shall include: 1) a description of the discharge and cause of noncompliance; and 2) the period of noncompliance, including exact dates and times, or, if not yet corrected, the anticipated time the noncompliance is expected to continue, and the steps taken to reduce, eliminate and prevent recurrence of the noncomplying discharge.

7. Spill Notification

The permittee shall immediately report any release of any polluting material which occurs to the surface waters or groundwaters of the state, unless the permittee has determined that the release is not in excess of the threshold reporting quantities specified in the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code), by calling the Department at the number indicated on the second page of this permit (or, if this is a general permit, on the COC); or, if the notice is provided after regular working hours, by calling the Department's 24-hour Pollution Emergency Alerting System telephone number, 1-800-292-4706.

Within 10 days of the release, the permittee shall submit to the Department via MiEnviro Portal (<https://mienviro.michigan.gov/ncore/>) a full written explanation as to the cause of the release, the discovery of the release, response measures (clean-up and/or recovery) taken, and preventive measures taken or a schedule for completion of measures to be taken to prevent reoccurrence of similar releases.

8. Upset Noncompliance Notification

If a process "upset" (defined as an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee) has occurred, the permittee who wishes to establish the affirmative defense of upset shall notify the Department by telephone within 24 hours of becoming aware of such conditions; and within five (5) days, provide in writing, the following information:

- a. that an upset occurred and that the permittee can identify the specific cause(s) of the upset;
- b. that the permitted wastewater treatment facility was, at the time, being properly operated and maintained (note that an upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation); and
- c. that the permittee has specified and taken action on all responsible steps to minimize or correct any adverse impact in the environment resulting from noncompliance with this permit.

No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

In any enforcement proceedings, the permittee, seeking to establish the occurrence of an upset, has the burden of proof.

9. Bypass Prohibition and Notification

- a. Bypass Prohibition
Bypass is prohibited, and the Department may take an enforcement action, unless:
 - 1) bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
 - 2) there were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass; and

PART II

Section C. Reporting Requirements

- 3) the permittee submitted notices as required under 9.b. or 9.c. below.
- b. **Notice of Anticipated Bypass**
If the permittee knows in advance of the need for a bypass, the permittee shall submit written notification to the Department before the anticipated date of the bypass. This notification shall be submitted at least 10 days before the date of the bypass; however, the Department will accept fewer than 10 days advance notice if adequate explanation for this is provided. The notification shall provide information about the anticipated bypass as required by the Department. The Department may approve an anticipated bypass, after considering its adverse effects, if it will meet the three (3) conditions specified in a. above.
 - c. **Notice of Unanticipated Bypass**
As soon as possible but no later than 24 hours from the time the permittee becomes aware of the unanticipated bypass, the permittee shall notify the Department by calling the number indicated on the second page of this permit (or, if this is a general permit, on the COC); or, if notification is provided after regular working hours, call the Department's 24-hour Pollution Emergency Alerting System telephone number, 1-800-292-4706.
 - d. **Written Report of Bypass**
A written submission shall be provided within five (5) working days of commencing any bypass to the Department, and at additional times as directed by the Department. The written submission shall contain a description of the bypass and its cause; the period of bypass, including exact dates and times, and if the bypass has not been corrected, the anticipated time it is expected to continue; steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass; and other information as required by the Department.
 - e. **Bypass Not Exceeding Limitations**
The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to ensure efficient operation. These bypasses are not subject to the provisions of 9.a., 9.b., 9.c., and 9.d., above. This provision does not relieve the permittee of any notification responsibilities under Part II.C.11. of this permit.
 - f. **Definitions**
 - 1) Bypass means the intentional diversion of waste streams from any portion of a treatment facility.
 - 2) Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

10. Bioaccumulative Chemicals of Concern (BCC)

Consistent with the requirements of R 323.1098 and R 323.1215 of the Michigan Administrative Code, the permittee is prohibited from undertaking any action that would result in a lowering of water quality from an increased loading of a BCC unless an increased use request and antidegradation demonstration have been submitted and approved by the Department.

PART II

Section C. Reporting Requirements

11. Notification of Changes in Discharge

The permittee shall notify the Department via MiEnviro Portal (<https://mienviro.michigan.gov/ncore/>), as soon as possible but within no more than 10 days of knowing, or having reason to believe, that any activity or change has occurred or will occur which would result in the discharge of: 1) detectable levels of chemicals on the current Michigan Critical Materials Register, priority pollutants or hazardous substances set forth in 40 CFR 122.21, Appendix D, or the Pollutants of Initial Focus in the Great Lakes Water Quality Initiative specified in 40 CFR 132.6, Table 6, which were not acknowledged in the application or listed in the application at less than detectable levels; 2) detectable levels of any other chemical not listed in the application or listed at less than detection, for which the application specifically requested information; or 3) any chemical at levels greater than five times the average level reported in the complete application (see the first page of this permit, for the date(s) the complete application was submitted). Any other monitoring results obtained as a requirement of this permit shall be reported in accordance with the compliance schedules.

12. Changes in Facility Operations

Any anticipated action or activity, including but not limited to facility expansion, production increases, or process modification, which will result in new or increased loadings of pollutants to the receiving waters must be reported to the Department by a) submission of an increased use request (application) and all information required under R 323.1098 (Antidegradation) of the Water Quality Standards or b) by written notice if the following conditions are met: 1) the action or activity will not result in a change in the types of wastewater discharged or result in a greater quantity of wastewater than currently authorized by this permit; 2) the action or activity will not result in violations of the effluent limitations specified in this permit; 3) the action or activity is not prohibited by the requirements of Part II.C.10.; and 4) the action or activity will not require notification pursuant to Part II.C.11. Following such written notice, the permit or, if applicable, the facility's COC, may be modified according to applicable laws and rules to specify and limit any pollutant not previously limited.

13. Transfer of Ownership or Control

In the event of any change in ownership or control of facilities from which the authorized discharge emanates, the following requirements apply: Not less than 30 days prior to the actual transfer of ownership or control – for non-CAFOs, or within 30 days of the actual transfer of ownership or control – for CAFOs, the permittee shall submit to the Department via MiEnviro Portal (<https://mienviro.michigan.gov/ncore/>) a written agreement between the current permittee and the new permittee containing: 1) the legal name and address of the new owner; 2) a specific date for the effective transfer of permit responsibility, coverage and liability; and 3) a certification of the continuity of or any changes in operations, wastewater discharge, or wastewater treatment.

If the new permittee is proposing changes in operations, wastewater discharge, or wastewater treatment, the Department may propose modification of this permit in accordance with applicable laws and rules.

14. Operations and Maintenance Manual

For wastewater treatment facilities that serve the public (and are thus subject to Part 41 of the NREPA), Section 4104 of Part 41 and associated Rule 2957 of the Michigan Administrative Code allow the Department to require an Operations and Maintenance (O&M) Manual from the facility. An up-to-date copy of the O&M Manual shall be kept at the facility and shall be provided to the Department upon request. The Department may review the O&M Manual in whole or in part at its discretion and require modifications to it if portions are determined to be inadequate.

At a minimum, the O&M Manual shall include the following information: permit standards; descriptions and operation information for all equipment; staffing information; laboratory requirements; record keeping requirements; a maintenance plan for equipment; an emergency operating plan; safety program information; and copies of all pertinent forms, as-built plans, and manufacturer's manuals.

PART II

Section C. Reporting Requirements

Certification of the existence and accuracy of the O&M Manual shall be submitted to the Department at least sixty days prior to start-up of a new wastewater treatment facility. Recertification shall be submitted sixty days prior to start-up of any substantial improvements or modifications made to an existing wastewater treatment facility.

15. Signatory Requirements

All applications, reports, or information submitted to the Department in accordance with the conditions of this permit and that require a signature shall be signed and certified as described in the Clean Water Act and the NREPA.

The Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance, shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

The NREPA (Section 3115(2)) provides that a person who at the time of the violation knew or should have known that he or she discharged a substance contrary to this part, or contrary to a permit, COC, or order issued or rule promulgated under this part, or who intentionally makes a false statement, representation, or certification in an application for or form pertaining to a permit or COC or in a notice or report required by the terms and conditions of an issued permit or COC, or who intentionally renders inaccurate a monitoring device or record required to be maintained by the Department, is guilty of a felony and shall be fined not less than \$2,500.00 or more than \$25,000.00 for each violation. The court may impose an additional fine of not more than \$25,000.00 for each day during which the unlawful discharge occurred. If the conviction is for a violation committed after a first conviction of the person under this subsection, the court shall impose a fine of not less than \$25,000.00 per day and not more than \$50,000.00 per day of violation. Upon conviction, in addition to a fine, the court in its discretion may sentence the defendant to imprisonment for not more than 2 years or impose probation upon a person for a violation of this part. With the exception of the issuance of criminal complaints, issuance of warrants, and the holding of an arraignment, the circuit court for the county in which the violation occurred has exclusive jurisdiction. However, the person shall not be subject to the penalties of this subsection if the discharge of the effluent is in conformance with and obedient to a rule, order, permit, or COC of the Department. In addition to a fine, the attorney general may file a civil suit in a court of competent jurisdiction to recover the full value of the injuries done to the natural resources of the state and the costs of surveillance and enforcement by the state resulting from the violation.

16. Electronic Reporting

Upon notice by the Department that electronic reporting tools are available for specific reports or notifications, the permittee shall submit electronically via MiEnviro Portal (<https://mienviro.michigan.gov/ncore/>) all such reports or notifications as required by this permit, on forms provided by the Department.

PART II

Section D. Management Responsibilities

1. Duty to Comply

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit, more frequently than, or at a level in excess of, that authorized, shall constitute a violation of the permit.

It is the duty of the permittee to comply with all the terms and conditions of this permit. Any noncompliance with the Effluent Limitations, Special Conditions, or terms of this permit constitutes a violation of the NREPA and/or the Clean Water Act and constitutes grounds for enforcement action; for permit or COC termination, revocation and reissuance, or modification; or denial of an application for permit or COC renewal.

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

2. Operator Certification

The permittee shall have the waste treatment facilities under direct supervision of an operator certified at the appropriate level for the facility certification by the Department, as required by Sections 3110 and 4104 of the NREPA. Permittees authorized to discharge storm water shall have the storm water treatment and/or control measures under direct supervision of a storm water operator certified by the Department, as required by Section 3110 of the NREPA.

3. Facilities Operation

The permittee shall, at all times, properly operate and maintain all treatment or control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance includes adequate laboratory controls and appropriate quality assurance procedures.

4. Power Failures

In order to maintain compliance with the effluent limitations of this permit and prevent unauthorized discharges, the permittee shall either:

- a. provide an alternative power source sufficient to operate facilities utilized by the permittee to maintain compliance with the effluent limitations and conditions of this permit; or
- b. upon the reduction, loss, or failure of one or more of the primary sources of power to facilities utilized by the permittee to maintain compliance with the effluent limitations and conditions of this permit, the permittee shall halt, reduce or otherwise control production and/or all discharge in order to maintain compliance with the effluent limitations and conditions of this permit.

5. Adverse Impact

The permittee shall take all reasonable steps to minimize or prevent any adverse impact to the surface waters or groundwaters of the state resulting from noncompliance with any effluent limitation specified in this permit including, but not limited to, such accelerated or additional monitoring as necessary to determine the nature and impact of the discharge in noncompliance.

6. Containment Facilities

The permittee shall provide facilities for containment of any accidental losses of polluting materials in accordance with the requirements of the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code). For a POTW, these facilities shall be approved under Part 41 of the NREPA.

PART II

Section D. Management Responsibilities

7. Waste Treatment Residues

Residuals (i.e., solids, sludges, biosolids, filter backwash, scrubber water, ash, grit, or other pollutants or wastes) removed from or resulting from treatment or control of wastewaters, including those that are generated during treatment or left over after treatment or control has ceased, shall be disposed of in an environmentally compatible manner and according to applicable laws and rules. These laws may include, but are not limited to, the NREPA, Part 31 for protection of water resources, Part 55 for air pollution control, Part 111 for hazardous waste management, Part 115 for solid waste management, Part 121 for liquid industrial wastes, Part 301 for protection of inland lakes and streams, and Part 303 for wetlands protection. Such disposal shall not result in any unlawful pollution of the air, surface waters or groundwaters of the state.

8. Right of Entry

The permittee shall allow the Department, any agent appointed by the Department, or the Regional Administrator, upon the presentation of credentials and, for animal feeding operation facilities, following appropriate biosecurity protocols:

- a. to enter upon the permittee's premises where an effluent source is located or any place in which records are required to be kept under the terms and conditions of this permit; and
- b. at reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect process facilities, treatment works, monitoring methods and equipment regulated or required under this permit; and to sample any discharge of pollutants.

9. Availability of Reports

Except for data determined to be confidential under Section 308 of the Clean Water Act and Rule 2128 (R 323.2128 of the Michigan Administrative Code), all reports prepared in accordance with the terms of this permit and required to be submitted to the Department shall be available for public inspection via MiEnviro Portal (<https://mienviro.michigan.gov/ncore/>). As required by the Clean Water Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Clean Water Act and Sections 3112, 3115, 4106 and 4110 of the NREPA.

10. Duty to Provide Information

The permittee shall furnish to the Department via MiEnviro Portal (<https://mienviro.michigan.gov/ncore/>), within a reasonable time, any information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or the facility's COC, or to determine compliance with this permit. The permittee shall also furnish to the Department, upon request, copies of records required to be kept by this permit.

Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information.

PART II

Section E. Activities Not Authorized by This Permit

1. Discharge to the Groundwaters

This permit does not authorize any discharge to the groundwaters. Such discharge may be authorized by a groundwater discharge permit issued pursuant to the NREPA.

2. POTW Construction

This permit does not authorize or approve the construction or modification of any physical structures or facilities at a POTW. Approval for the construction or modification of any physical structures or facilities at a POTW shall be by permit issued under Part 41 of the NREPA.

3. Civil and Criminal Liability

Except as provided in permit conditions on "Bypass" (Part II.C.9. pursuant to 40 CFR 122.41(m)), nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance, whether or not such noncompliance is due to factors beyond the permittee's control, such as accidents, equipment breakdowns, or labor disputes.

4. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee may be subject under Section 311 of the Clean Water Act except as are exempted by federal regulations.

5. State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by Section 510 of the Clean Water Act.

6. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other Department of Environment, Great Lakes, and Energy permits, or approvals from other units of government as may be required by law.

Enclosure 15
HDI PNP 2024-037

Enclosure 15

HDI PNP 2024-037

Response to Request for Additional Information –

RAI-TE-1

**Regarding the Proposed Reauthorization of Power Operations of
Palisades Nuclear Plant Under
Renewed Facility Operating License No. DPR-20**

NRC RAI Number: RAI-TE-1

The 2013 License Renewal (LR) Generic Environmental Impact Statement (GEIS), NUREG-1437 Rev. 1, stated that cooling system changes were made at PNP to address sulfate deposition and temporary excessive icing conditions that resulted in the conversion of about 5 acres of dune forest near the mechanical draft cooling tower to dense scrub-shrub. a) Summarize the changes made to mechanical cooling towers (operational, infrastructure) to address the vegetation impacts from drift. Include whether the cooling towers have drift eliminators. b) Provide a map showing location of drift impacted vegetation from previous operations. c) If operational changes have occurred to the cooling towers that resulted in dune forest establishment, provide a description. d) Summarize any differences in predicted drift from cooling tower operations. (See also MET-2)

Enclosure 2, "Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant," did not provide an updated analysis of drift impacts from resumed operations.

HDI Response to RAI:

The cooling tower concern was originally discussed in the 1996 GEIS and mentioned as a past and resolved environmental concern in the 2006 LR SEIS. As mentioned in Enclosure 2, "*Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant*", Section 2.1.1, of the 10 CFR 50.82 Exemption Request (ML23271A140), the cooling towers were replaced in 2012 and 2017. An independent third-party drift emissions inspection report states that the drift eliminators have a guaranteed drift rate of 0.001 percent of the circulating water flow rate.

References:

None.

Associated Attachments:

None.

Enclosure 16
HDI PNP 2024-037

Enclosure 16
HDI PNP 2024-037
Response to Request for Additional Information –
RAI-SE-1
Regarding the Proposed Reauthorization of Power Operations of
Palisades Nuclear Plant Under
Renewed Facility Operating License No. DPR-20

NRC RAI Number: RAI-SE-1

As briefly indicated in Section 3.4, the planned restart-related activities will likely require a significant number of temporary workers. Provide more information about the temporary workforce, including the number and residence of the temporary workers, work schedule/duration, etc.?

Enclosure 2, "Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant", did not completely address this aspect of Socioeconomics.

HDI Response to RAI:

The temporary workforce for Restart activities is expected to be similar in size to a typical outage workforce of ~1,000 workers. Like for outages, this workforce would be split in shifts. Onsite facilities (e.g., parking) would accommodate about 900 staff at one time. Restart activities are currently in progress following the conditional commitment to PNP from the U.S. Department of Energy (DOE) Loans Office and are currently projected to be completed in October 2025. A peak of activities would occur in 2025. A figure showing the staffing level estimate is provided in Attachment 1.

References:

None.

Associated Attachments:

1. Staffing Level Estimate for Restart

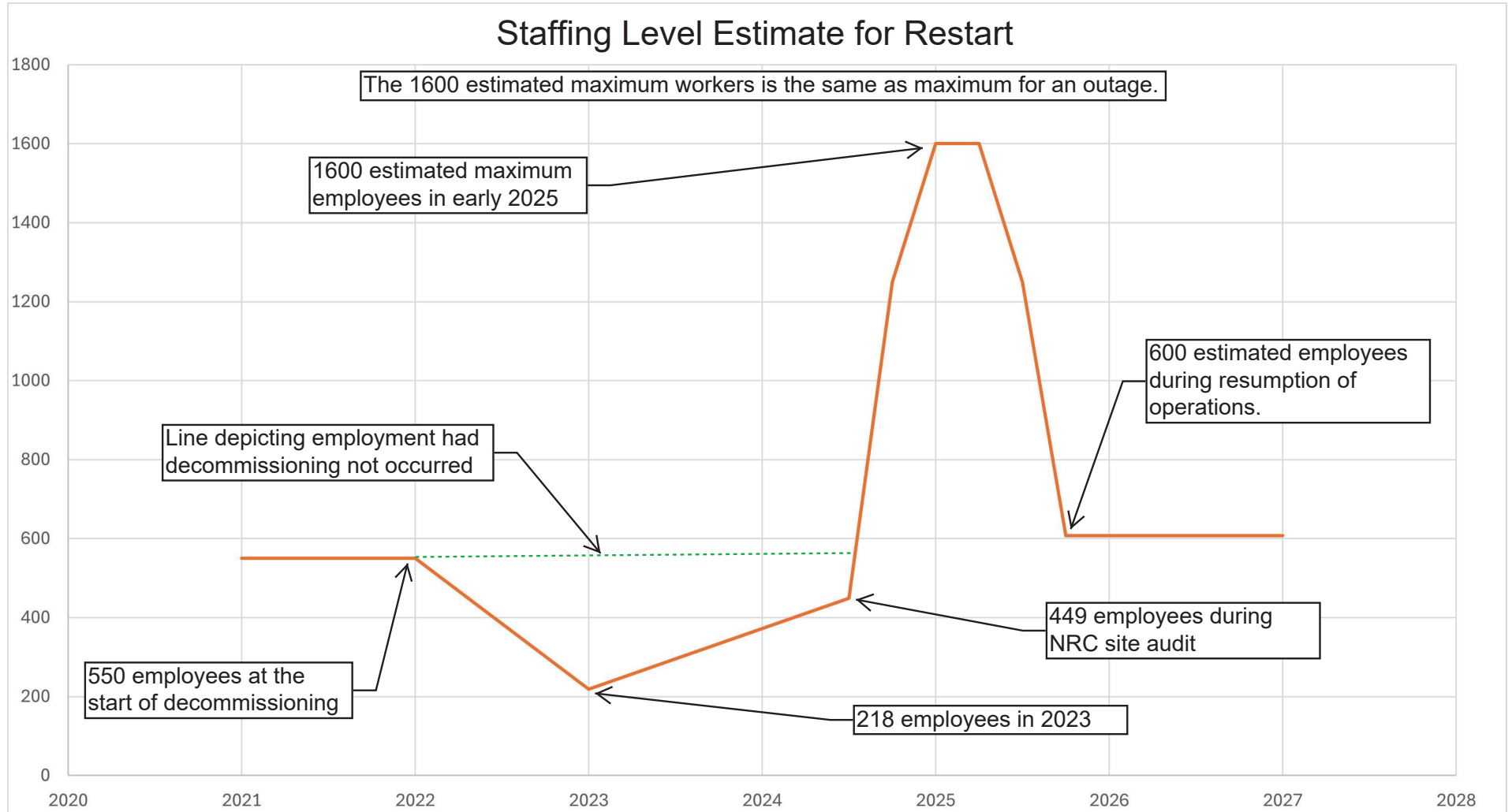
Enclosure 16
Attachment 1
HDI PNP 2024-037

HDI PNP 2024-037

Enclosure 16

Attachment 1 - Staffing Level Estimate for Restart

1 page follows



The 1600 estimated maximum workers is the same as maximum for an outage.

1600 estimated maximum employees in early 2025

Line depicting employment had decommissioning not occurred

600 estimated employees during resumption of operations.

550 employees at the start of decommissioning

449 employees during NRC site audit

218 employees in 2023

The employment population is the same as a typical outage employment population when the green dashed line is used.

Enclosure 17
HDI PNP 2024-037

Enclosure 17

HDI PNP 2024-037

Response to Request for Additional Information –

RAI-SE-2

**Regarding the Proposed Reauthorization of Power Operations of
Palisades Nuclear Plant Under
Renewed Facility Operating License No. DPR-20**

NRC RAI Number: RAI-SE-2

Provide a description and breakdown of projected plant employment during operations (similar to Palisades' Permanent Employee Residence Information from the 2006 LR EIS Supplement table 2-3).

Enclosure 2, "Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant", did not completely address this aspect of Socioeconomics.

HDI Response to RAI:

Table 2-3 in the 2006 SEIS is produced from existing data rather than a projection. The projected plant employment is expected to have similar distribution. Comparing the distribution of the 218 current employees to the distribution of the 524 employees of Table 2-3 is similar. As an example, Van Buren County had 41 percent of PNP's employees in 2023 while it had 44 percent in 2006. Berrien County had 24 percent in 2023 and 33 percent in 2006. As such, Table 2-3 of the 2006 SEIS would provide a reasonable projected plant employment distribution. During the site audit, the NRC requested a current employment count with county information and demographics. Employment counts with county information and demographics for mid-2024 are provided in Attachment 1.

References:

None

Associated Attachments:

1. Palisades Holtec Demographic Information 07/09/2024

Enclosure 17
HDI PNP 2024-037

HDI PNP 2024-037

Enclosure 17

Attachment 1 - Palisades Holtec Demographic Information 07/09/2024

2 pages follow

Palisades Holtec Demographic Information 07/09/2024

Current workforce - goal workforce (449 - 608)

| Gender/Ethnicity/Race | % Employees |
|--------------------------------------------|-------------|
| Female | 20% |
| Hispanic | 1% |
| Black or African American | 1% |
| Two or more races (Not Hispanic or Latino) | 1% |
| White | 17% |
| Male | 80% |
| Hispanic | 3% |
| Black or African American | 3% |
| Two or more races (Not Hispanic or Latino) | 2% |
| White | 71% |

| EEO Category | #Employees | Av Age | Av Salary |
|----------------------------------------|------------|--------|-----------|
| Administrative Support Workers | 20 | 44.4 | \$75,364 |
| Craft Workers | 73 | 41.6 | \$111,061 |
| First/Mid-Level Officials and Managers | 89 | 46.6 | \$169,512 |
| Operatives | 10 | 44.9 | \$96,595 |
| Professionals | 84 | 50.6 | \$128,832 |
| Service Workers | 134 | 40.8 | \$67,270 |
| Technicians | 39 | 41.4 | \$104,865 |
| Overall | 449 | 44.3 | \$110,452 |

| State/County | Gender | # Emp |
|------------------------------------|--------|------------|
| MI | | 424 |
| Allegan County | Female | 3 |
| | Male | 20 |
| Allegan County Total | | 23 |
| Allen County | Male | 1 |
| Allen County Total | | 1 |
| Barry County | Male | 1 |
| Barry County Total | | 1 |
| Berrien | Male | 1 |
| Berrien Total | | 1 |
| Berrien County | Female | 32 |
| | Male | 117 |
| Berrien County Total | | 149 |
| Calhoun County | Male | 1 |
| Calhoun County Total | | 1 |
| Cass County | Male | 6 |
| Cass County Total | | 6 |
| Grand Traverse County | Male | 1 |
| Grand Traverse County Total | | 1 |
| Kalamazoo County | Female | 3 |
| | Male | 23 |
| Kalamazoo County Total | | 26 |
| Kent County | Male | 13 |
| Kent County Total | | 13 |
| Livingston County | Male | 1 |
| Livingston County Total | | 1 |
| Monroe County | Female | 1 |
| | Male | 1 |
| Monroe County Total | | 2 |
| Muskegon County | Male | 1 |
| Muskegon County Total | | 1 |
| Oakland County | Male | 1 |
| Oakland County Total | | 1 |
| Ottawa County | Female | 2 |
| | Male | 35 |
| Ottawa County Total | | 37 |
| St. Joseph County | Male | 1 |
| St. Joseph County Total | | 1 |
| Van Buren County | Female | 42 |
| | Male | 114 |
| Van Buren County Total | | 156 |
| Warren County | Female | 1 |
| | Male | 1 |
| Warren County Total | | 2 |
| Washtenaw County | Female | 1 |

| State/County | Gender | # Emp |
|--------------------------------|--------|------------|
| AR | | 2 |
| Pope County | Male | 2 |
| IA | | 1 |
| Linn County | Male | 1 |
| IL | | 4 |
| Cook County | Male | 1 |
| Grundy County | Male | 1 |
| Whiteside County | Male | 1 |
| Will County | Male | 1 |
| IN | | 5 |
| Marion County | Female | 1 |
| St. Joseph County | Female | 2 |
| | Male | 2 |
| MN | | 1 |
| Dakota County | Male | 1 |
| MS | | 1 |
| Warren County | Male | 1 |
| NC | | 2 |
| Gaston County | Female | 1 |
| Lincoln County | Male | 1 |
| NM | | 1 |
| Bernalillo County | Male | 1 |
| Bernalillo County Total | | 1 |
| NY | | 1 |
| Orange | Male | 1 |
| PA | | 2 |
| Chester County | Male | 1 |
| York County | Male | 1 |
| SC | | 2 |
| Berkeley County | Male | 1 |
| York County | Male | 1 |
| TN | | 1 |
| Sumner County | Male | 1 |
| TX | | 1 |
| Harrison County | Male | 1 |
| WI | | 1 |
| Brown County | Male | 1 |
| Grand Total | | 449 |

Enclosure 18
HDI PNP 2024-037

**Enclosure 18
HDI PNP 2024-037**

Response to Request for Additional Information –

RAI-EJ-1

**Regarding the Proposed Reauthorization of Power Operations of
Palisades Nuclear Plant Under
Renewed Facility Operating License No. DPR-20**

NRC RAI Number: RAI-EJ-1

Has HDI engaged with any local communities or groups with EJ concerns? If so, provide summaries of any engagements to help inform the NRC staff's EJ review.

Enclosure 2, "Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant," did not provide this information.

HDI Response to RAI:

Holtec has maintained an active community and stakeholder outreach effort with local, state, federal, and Tribal leaders to keep them well-informed of ongoing plant activities. A draft of the Community Benefits Plan is provided in Attachment 1.

References:

None.

Associated Attachments:

1. DRAFT -- Community Benefits Plan

Enclosure 18
Attachment 1
HDI PNP 2024-037

HDI PNP 2024-037

Enclosure 18

Attachment 1 - DRAFT – Community Benefits Plan

43 pages follow

DRAFT – Community Benefits Plan
FOA Number, FOA Title
Holtec International
Palisades Resurrection Project

Purpose

The Palisades Community Benefits Plan (CBP) outlines a comprehensive strategy to support community and labor engagement; ensure job quality and workforce continuity; promote diversity, equity, inclusion, and accessibility; and support the Biden-Harris administration’s Justice40 goals of benefiting disadvantaged communities. This CBP has been developed to support the repowering of the Palisades Nuclear Power Plant and maximize positive impacts on the surrounding communities, minimize project risk, and build upon long-existing, broad-based community and stakeholder support for the plant and now its historic repowering.

A. General Project Information**1. Construction Information**

The Palisades Nuclear Power Plant is located at 27780 Blue Star Highway, Covert, MI 49043. During operation, Palisades produces 800 megawatts of safe, reliable, and carbon-free energy to support our energy needs and achieve our clean climate goals. This project is primarily a maintenance project versus a typical construction project (i.e., not “new build”). The majority of the work will be performed on existing power plant systems, equipment, and buildings, which are well-understood and have been maintained throughout the plant’s proven history of safe, reliable operation. The site has a robust safety program, culture, and procedures that have carried over from operations and adhere to industry best practices and standards.

Holtec’s workforce augmentation efforts have met with great success, with more than 375 Holtec associates employed at the plant as of May 2024, an increase of nearly 150 personnel since the re-start program began. This recruitment initiative has led to the on-boarding of new talent as well as the return of former plant associates, contributing to the preservation and creation of hundreds of high-paying jobs in Michigan. Hiring is on track and scheduled to continue across all disciplines through 2025. Notably, nearly half of these associates are union members, representing the United Workers Union of America (UWUA) and the United Government Security Officers of America (UGSOA). Holtec has successfully executed a recommissioning labor agreement with 15 trade unions that are supporting the project, reinforcing our commitment to collaboration with unionized labor, fair labor practices, and the highest standards of quality and safety.

2. Locations and Communities Affected

As a major employer, taxpayer, charitable contributor, economic engine, and generator of reliable carbon-free electricity, the environmental and socioeconomic benefits of the Palisades

Nuclear Power Plant are significant to the greater Southwest Michigan region and beyond. In fact, a study published in 2023 by the Economic Growth Institute at the University of Michigan determined the premature shutdown of Palisades resulted in an annual loss of \$259 million in labor income and value added (direct, indirect, and induced across industries) for just a tri-county region in Southwest Michigan alone. Those benefits are most immediately felt in the four-county region of Allegan, Berrien, Cass, and Van Buren counties, in which the overwhelming majority of the plant's workforce resided during times of regular operation and since its shutdown in May 2022. During operation, more than half of the plant's 600-member workforce lived in or around the greater Covert-South Haven and Benton Harbor-St. Joseph communities in Van Buren, Allegan, and Berrien counties, respectively, which have absorbed the most direct economic hardship of the site's workforce and/or tax reductions since the plant's early shutdown. Those hardships would remain legacy challenges for those recovering communities were a repowering of the facility not to occur.

Palisades is geographically located in Covert Township, Van Buren County (Census Tract 26159010600) and closely neighbors economically impacted communities and federally recognized Tribal lands. The plant is located on the eastern shore of Lake Michigan, between the cities of South Haven and Benton Harbor, Michigan. Palisades is located near several federally recognized disadvantaged communities (DACs), a full listing of which is included in the Palisades CBP Appendix along with CEJST and MiEJScreen maps. Covert Township has benefited from the economic activity and tax revenues generated by Palisades, which support township public services (e.g., police/fire/EMT) and the Covert Public Schools system. The Covert Public School system serves a diverse student population. Snapshots pulled from federal and state databases of the greater Covert community and surrounding public school systems are also included in the Palisades CBP Appendix.

Covert Township, and more broadly Van Buren County, has benefitted from Palisades's support through property taxes received by other area taxing units, including the Van Buren District Library (which has a branch location in Covert Township), Lake Michigan College (which has a satellite campus in neighboring South Haven), the Van Buren Intermediate School District (which provides career and technical training for Van Buren County public school students and resources for residents with special needs), and the Van Buren County government, which provides transportation infrastructure and public transit, law enforcement, community health, veterans affairs, senior services, courts and public defenders services, among other critical services to area residents.

The City of South Haven and South Haven Charter Township are located to the immediate north of the Palisades Plant and Covert Township. Residences within the South Haven ZIP code (which also includes portions of Bangor, Casco, and Geneva townships) accounted for a plurality of the plant workforce during operation.

To the south of Covert Township is the City of Benton Harbor and Benton Charter Township, which are also classified by the federal government as DACs.

The Pokagon Band of Potawatomi is headquartered near the City of Dowagiac, Cass County, Michigan. The Band owns Tribal property throughout the Michigan tri-county region of Berrien, Cass, and Van Buren counties as well as in nearby Northern Indiana.

Palisades has benefited from strong community support throughout its operation, evidenced by the broad base support for the plant's repowering.

DRAFT

B. Community and Labor Engagement

The Palisades repowering has broad-based support from the local community and labor unions, which long supported the plant during operation. The Palisades CBP prioritizes transparent, inclusive, and meaningful engagement with all stakeholders. Through open dialogues and consultation, we seek to maintain those strong partnerships and be receptive to any needs, concerns, and aspirations related to the repowering project and future operation of the plant. These continued engagements will help ensure that the interests of the benefited communities and labor force are integrated into the project's implementation. Holtec has found that outreach best begins in the earliest stages, which is the case at Palisades where stakeholder outreach efforts have been active during operation and in the years prior to the plant's early shutdown.

1. Community and Labor Stakeholder Engagement

Palisades has built and maintained a strong program of community engagement and stakeholder outreach, which has continued under the ownership of Holtec with strong enthusiasm for the restart. That engagement extends to federal, state, local, and Tribal partners and encompasses public officials, governmental departments and agencies, community-based organizations, local residents, economic and workforce development organizations, organized labor, and the broader nuclear industry. Those relationships are evidenced by the strong degree of support for the Palisades repowering. Beyond public support, those relationships include ongoing exploration of opportunities to further solidify a local talent pipeline to meet future plant and area workforce needs. Many stakeholder partners have also participated in U.S. Nuclear Regulatory Commission (NRC) public meetings concerning the proposed path to reauthorize plant operations, including public comment in support of such effort.

Federal Partners

- U.S. Senator Debbie Stabenow
- U.S. Senator Gary Peters
- U.S. Representative Bill Huizenga
- U.S. Representative Tim Walberg

State Partners

- Michigan Governor Gretchen Whitmer
- State Representative Joey Andrews, D – St. Joseph, *Vice Chair of the Michigan House Energy and Technology Committee*
- State Representative Pauline Wendzel, R – Bainbridge, *Minority Vice Chair of the Michigan House Energy and Technology Committee*
- State Senator Aric Nesbitt, R – Lawton, *Michigan Senate Minority Leader*

- State Senator Sean McCann, D – Kalamazoo, *Chair of the Michigan Senate Energy and Technology Committee*
- Michigan House and Senate Nuclear Caucus
- Michigan House and Senate
 - Outreach to Michigan House and Senate majority and minority leaders, committee chairs, and caucus members

State Agency Partners

- Michigan Public Service Commission (MPSC)
- Michigan Department of Environment, Great Lakes, and Energy (EGLE)
- Michigan Department of Natural Resources (DNR)
- Michigan Department of Labor and Economic Opportunity (LEO)
- Michigan State Police (MSP)

Community Partners – Governmental

- Covert Township
 - Daywi Cook, Township Supervisor
- City of South Haven
 - Scott Smith, Mayor
 - Kate Hosier, City Manager
- South Haven Charter Township
 - Ross Stein, Township Supervisor
- Geneva Township
 - Nancy Whaley, Township Supervisor
- Casco Township
 - Allan Overhiser, Township Supervisor
- Van Buren County
 - Van Buren County Board of Commissioners
 - Van Buren County Administrator John Faul
 - Van Buren County Treasurer Trisha Nesbitt
 - Van Buren County Sheriff Dan Abbott
 - Van Buren County Emergency Preparedness Director Ray Hochsprung
 - Van Buren County Health Officer Danielle Persky
- Allegan County
 - Allegan County Board of Commissioners Chair Jim Storey
 - Allegan County Emergency Management Coordinator Sarah Clark
- Berrien County
 - Berrien County Administrator Brian Disette
 - Berrien County Emergency Management Coordinator Rockey Adams

Community Partners – Non-Governmental

- Covert Public Schools
 - Yolanda Brunt, Superintendent
- South Haven Public Schools
 - Kevin Schooley, Superintendent
- Van Buren Intermediate School District
 - Dave Manson, Superintendent
- Van Buren District Library
 - Dan Hutchins, Director
- Lake Michigan College
 - Al Pscholka, Executive Director
- South Haven Hospital
 - Todd Skinner, Emergency Preparedness Coordinator
- Covert Township Community Foundation
 - Wayne Rendell, Executive Director

Tribal Partners

Palisades has actively sought to engage local Tribal partners, primarily the Pokagon Band of Potawatomi, which is headquartered in nearby Dowagiac, Michigan, as well as the Little Traverse Bay Bands of Odawa Indians, which is headquartered near Holtec's decommissioned Big Rock Point Nuclear Facility near Charlevoix, Michigan. Tribal outreach consists of the engagement tools outlined further below, including regular participation in the plant's monthly stakeholder conference call; periodic in-person updates to staff and presentation to the Pokagon Tribal Council; inclusion in the Palisades Community Advisory Panel; site visits, including 1) a three-day visit that was facilitated with the U.S. Department of Energy to discuss Holtec's decommissioning and dry fuel storage capabilities and dialogue on the future of spent fuel transportation and related environmental impacts and 2) a presentation and roundtable discussion hosted by the International Joint Commission regarding the decommissioning of nuclear power plants on the Great Lakes.

- Pokagon Band of Potawatomi
 - Jennifer Kanine, Department of Natural Resources
- Little Traverse Bay Bands of Odawa Indians
 - Traven Michaels, Department of Natural Resources

Economic / Community Development Partners

Holtec is an invested partner in the region's economic and social prosperity. The company actively participates in local and statewide organizations that enable it to share information, solicit feedback, and answer questions related to the company and the Palisades repowering effort, as well as to better understand the aspirations and challenges within the local

community and facing peers in other industries. Those partnerships include public educational institutions, local economic development, workforce development, economic planning, local and state Chambers of Commerce, and state and federal associations. Beyond support for the repower, these long-term partnerships are focused on growing a local and regional workforce to support the nation's power industry.

- Market Van Buren
 - Zach Morris, Executive Director
 - Economic development organization for Van Buren and Cass counties, with broad and diverse representation from local units of government, business leaders, and private citizens. Originated in part to prepare the region for Palisades's announced closure.
- Lake Michigan College
 - Dr. David Krueger, Dean, Career and Workforce Education
 - Support re skills-based certification programs to support immediate labor needs and creation of talent pipeline as well as reinstatement of LMC nuclear training. Headquartered in Benton Harbor, Michigan, LMC provides educational and training services to a population of primarily local residents with a premium on affordability and improving access to higher education.
- Kinexus Group
 - Todd Gustafson, President and Chief Executive Officer
 - Workforce development organization for Berrien, Cass, and Van Buren counties. Interfaces with local businesses, state and local units of government to support job creation, career training, and economic challenges.
- Southwest Michigan Planning Commission
 - John Egelhaaf, Executive Director
 - Serving Berrien, Cass, and Van Buren counties. One of 14 regional planning and development organizations in the State. In partnership with the Economic Growth Institute at the University of Michigan, is focused on mitigating the impact of the Palisades plant closure and creating a roadmap for the area's long-term economic recovery.
- South Haven Area Chamber of Commerce
 - Kathy Wagaman, Executive Director
 - Representing more than 400 businesses in Van Buren County. Palisades is a long-time supporter of the Chamber, including its monthly business professional networking events, leadership training, and community/civic events.
- Southwest Michigan Regional Chamber of Commerce
 - Arthur Havlicek, Executive Director
 - Southwest Michigan's largest Chamber, based in St. Joseph/Benton Harbor. Also hosts monthly CEO council meeting for business leaders, federal/state/local officials to provide updates on legislative, municipal, and economic activities.
- Michigan Chamber of Commerce
 - Jim Holcomb, President and Chief Executive Officer

- Holtec participates in Environmental and Energy Policy and Tax Policy committees.
- Michigan Manufacturers Association
 - John Walsh, President and Chief Executive Officer
 - Holtec participates in Environmental, Energy, Tax, and Workforce Development subcommittees.

Labor Partners

As noted in further detail in this document, nearly half of Palisades associates are represented by the Utility Workers Union of America (UWUA) and the United Government Security Officers of America (UGSOA), both of which have active Collective Bargaining Agreements and a long history at Palisades.

Holtec successfully executed a Project Labor Agreement in February 2024 with 15 trade unions that are supporting the project: The International Association of Heat and Frost Insulators and Allied Workers; the International Brotherhood of Boilermakers, Iron Ship Builders, Blacksmiths, Forgers, and Helpers; the International Union of Bricklayers and Allied Craftworkers; the United Brotherhood of Carpenters and Joiners of America; the Operative Plasterers' and Cement Masons' International Association; the International Brotherhood of Electrical Workers; the International Association of Bridge, Structural, Ornamental and Reinforcing Iron Workers; the Laborers' International Union of North America; the International Union of Operating Engineers; the International Union of Painters and Allied Trades; the United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada; the United Union of Roofers, Waterproofers and Allied Workers; the International Association of Sheet Metal, Air, Rail and Transportation Workers; the International Brotherhood of Teamsters; and the International Union of Elevator Constructors.

2. Stakeholder Engagement Tools

Holtec utilizes a wide range of outreach tools to engage stakeholder groups as well as members of the public.

NRC Public Meetings

Since 2023, Holtec has participated in a series of public meetings with staff of the U.S. Nuclear Regulatory Commission (NRC) concerning the reauthorization of operations. Those meetings have entailed presentations by the company and include public s and comments. In April 2024, the NRC also hosted an in-person public meeting in Southwest Michigan regarding Palisades, which was held at Lake Michigan College in Benton Harbor.

Public Open Houses

In addition to participation in NRC public meetings and utilizing other avenues of public engagement, of which some are noted below, Holtec will be hosting informational public open houses on plant activities. The first of which is tentatively scheduled to take place in June 2024 at its Joint Information Center (JIC) in Beton Harbor. These events are designed to provide yet a further avenue for public feedback and direct engagement with plant personnel.

Public Inquiry

Holtec's Palisades Power Plant website – www.palisadespower.com – will include information on the repower and future operations, including common FAQs, plant information, and resource links. The updated website will also include an online form for members of the public to contact the plant with questions as well as information on career opportunities.

Weekly Meetings

Holtec proactively has alignments with external stakeholders on a frequent basis. These informational touchpoints to provide updates on plant activities, answer stakeholder questions, and receive feedback. Holtec also provides periodic public updates to county, township, and municipal units of government. Those interactions provide an additional avenue to answer questions from members of the public on current plant repowering activities.

Monthly Stakeholder Conference Call

Palisades hosts a monthly stakeholder conference call to which federal, state, community, Tribal, and economic development partners are invited to participate. The format of the call includes a formal update from senior site leadership on current plant status and station activities, an update on community affairs/outreach activities, and an open forum to discuss those or any other topics. The monthly stakeholder call ensures a standing touchpoint for stakeholders to raise questions, comments, and/or concerns if a touchpoint had not been made since the prior month's meeting.

Service Club/Community Meetings

Holtec is often invited to make public presentations at meetings of regional service clubs and community groups, such as Chambers of Commerce, Kiwanis International, and Rotary International. These venues provide an opportunity for long-form presentations and discussions with local residents about the Palisades restart project.

Site Tours

Holtec utilizes visits to Palisades to educate s and members of the public, providing a face-to-face platform with the plant leadership and plant subject matter experts.

Community Event Participation / Sponsorships

To support informal public interactions and maintain an open community presence, Holtec regularly participates in a variety of community events facilitated by the above stakeholders. That support includes charitable support, volunteerism, and in-person, engaged participation.

Charitable activities are prioritized for supporting public education, community resources, and disadvantaged communities.

Palisades Community Advisory Panel

Holtec holds two positions on the Palisades Community Advisory Panel (PCAP), which was formed in 2021 by the Van Buren County Board of Commissioners to serve as a conduit for public information and advice on the decommissioning of Palisades. The group also serves to support the economic recovery of the community and support long-term planning including the potential for site reuse. The PCAP is composed of diverse representations of the local community, including private citizens, public education, public health, public safety, local units of government, state agencies, Tribes, labor, and conservation representatives.

3. Collective Bargaining Agreement (Non-Construction)

Nearly half of Palisades associates belong to the Utility Workers Union of America Local 150 (UWUA) and the United Government Security Officers of America Local 29 (UGSOA) and plans to continue these affiliations throughout the scope of the project and the life of the plant operations.

UWUA job classifications include Operators, Electricians, Mechanics, Welders, Radiation Protection Technicians, I&C Technicians and Chemistry Technicians, and Stockkeepers. The training for the majority of those jobs is done on site to comply with NRC/ANSI standards. Ongoing Holtec recruitment efforts for these positions have been supported by applicants from the surrounding communities including the DACs near Palisades. The majority of the jobs require specific basics skills and knowledge to be successful, requiring applicants to take aptitude tests. These tests are developed by the Edison Electrical Institute (EEI) and Holtec has worked with EEI to implement best practices to promote increased diversity hiring. There is a current Collective Bargaining Agreement (CBA) and multiple MOU's with Holtec that the UWUA is currently operating under. Plans are underway to initiate a new CBA for restart. The site has long had a very good working relationship with the UWUA, holding regular meetings with the local UWUA representatives to ensure continued cooperation and discuss matters of mutual interest and concern.

The UGSOA represents members of the Palisades Security Department, the largest department on site. The union is operating under a CBA that was negotiated with the union in May 2022. Historically recruitment for the positions is almost exclusively local communities including the DACs in the area. Officer positions are commonly filled by associates with military and law enforcement backgrounds, and the training takes place upon hire on site. The current UGSOA CBA has a no-lockout and no-strike Article. Meetings with Union Leadership and Site Management occur regularly as one of the mechanisms for labor-management cooperation. UGSOA and Site Management have a positive, mutually respected relationship. The negotiated Security Officer wages are competitive with the local area and in most cases above average for any non-nuclear armed security officer or law enforcement officer.

4. Project Labor Agreement (Construction)

Holtec has successfully executed a Project Labor Agreement with 15 trades (please see above) in support of restart. The contract has language agreeing that there shall be no lockouts or strikes during the life of the Agreement. The Agreement also includes language defining the resolution mechanism for any disputes and grievances. Champion Specialty Services, LLC is identified as the principal contractor currently engaged to perform work at Palisades.

For future career readiness and talent pipeline creation, Holtec is engaged with local units of government and Market Van Buren to support the relocation and retention of a local workforce. Holtec is also in conversations with workforce development organization Kinexus Group of Benton Harbor, Michigan, to support the attraction and training of future associates. The company is also in discussion with Lake Michigan College and Van Buren Intermediate School District with respect to future skills-based training to meet hiring needs.

C. Investing in Job Quality and a Skilled Workforce

As part of our commitment to job quality, the Palisades repowering project will create opportunities for skilled and unskilled workers alike. The plant's Training program was successfully reestablished, and the Control Room Simulator reconstituted to support ongoing Operator training. Holtec will continue to invest in workforce development programs to provide training and skill enhancement, fostering a seamless transition for the current workforce while empowering new talent to participate in the clean energy economy. Our emphasis on workforce continuity ensures that local workers are at the forefront of the employment opportunities arising from the project.

1. Collective bargaining

As noted elsewhere, Palisades has a long history as a large union employer and relies upon union contractors (see Collective Bargaining and Project Labor Agreement sections above under "General Project Information" and "Community and Labor Engagement"). That commitment is underpinned by good working relationships and communications between site leadership and union representatives. Holtec is committed to upholding the principles of worker organizing and collective bargaining rights, going above and beyond our legal obligations as stipulated by the 1935 National Labor Relations Act. We believe that a workforce that is empowered to collectively voice their concerns and negotiate fair terms is crucial for a thriving and equitable work environment and a highly trained workforce. We affirm our adherence to Davis-Bacon compliance standards, ensuring that all workers involved in federally funded construction projects receive fair and prevailing wages.

2. Union support

The Palisades repowering effort is strongly backed by the labor community. Palisades has a large union workforce presence (UWUA and UGSOA), a Project Labor Agreement with 15 trades, and has long utilized local halls to support activities during operation and the plant's scheduled refueling and maintenance outages. Union labor will be used extensively as part of the repowering and during operation. Palisades received letters of support for the restart from several labor organizations.

3. Job quality

Holtec offers all full-time associates a competitive and comprehensive benefits package. The wages have been benchmarked within the nuclear industry and remain competitive, assigned wages outside of the CBAs are based on those used as an operating plant. Palisades wages greatly exceed the median household income for the surrounding counties (Van Buren - \$60,182; Allegan - \$75,901; Berrien - \$61,333; Cass - \$60,725) and neighboring municipalities (Covert Township - \$32,036; City of Benton Harbor - \$24,549; City of South Haven - \$55,469).

Safety is the highest priority at Palisades, operating under robust safety standards for both physical safety and the Nuclear Safety Culture (NSC) program. During operation, the plant ranked in the NRC's highest safety category. Our safety management system is the guide to how we view and work through our safety processes. It is fundamental to what we do and how we build and maintain our strong safety culture.

a. Ongoing Operations and Production Jobs

Commitment C3a.1: Holtec will provide competitive wages and benefits, benchmarked to the industry average for the region.

The 2021 Census data for median household income in Van Buren County, where Palisades is located, is \$60,182. The median household income in Covert Township is \$32,036, which is 45 percent below the median household income for the County. The anticipated average annual income for the fully staffed Palisades Operating plant based on the market reference value used for the financial models is \$104,013. The financial model also includes a 40% adder for all benefits and incentives.

The salaries in the financial model have been benchmarked for the industry averages and have been found to be competitive.

Commitment C3a.2: Holtec will provide workforce education and training.

Most of the training for the craft workforce is done as on-the-job training. Each discipline has a training program designed and administered within the sites Training department. Holtec feels an individual who possesses a desire to continue their education, in addition to performing their full-time job, shows a commitment to improving themselves and their position within Holtec. To encourage and reward these individuals, Holtec offers an Education Assistance benefit.

Full-time associates may continue their education in a related field and Holtec may reimburse all or part of the registration and tuition costs of a maximum of the annual costs up to a limit of \$5,000 per year for exempt associates and \$1,000 per year for non-exempt associates.

In addition to educational assistance for formal education, Holtec may arrange training programs that enable associates to progress in their technical knowledge of our business. If an associate becomes aware of a particular seminar that he or she believes is appropriate for enhancing their skills (and/or those of other associates), the associate is encouraged to bring it to the attention of his or her supervisor.

Commitment C3a.3: Holtec will ensure workers are engaged in the design and implementation of workplace safety and health plans.

Holtec Palisades provides all associates, contractors, vendors, and visitors with a workplace free from recognizable hazards. Palisades will adhere to all pertinent Michigan Occupational Safety Health Administration (MiOSHA) workplace standards for employee safety.

- **Safety Representative** – The Palisades site Safety Representative will continue to coordinate all administrative safety required tasks, be the competent and qualified safety person for the site and work closely with all personnel and departments on safe work execution. The site Safety Representative will serve as the interface between the Palisades company and MiOSHA regulatory entity.
- **Culture** – All associates, contractors, and visitors will use *self-awareness* and stay *engaged* to drive a heightened sense of *situational awareness*. This heightened sense will keep workers “on their game” and focused on the task at hand. Special safety meetings will be held at any time it is deemed necessary to do so. Pre-job briefs (PJB) will be conducted from a safety standpoint prior to work execution and job site safety reviews (JSR) will be conducted prior to, while work commences, and after the work is completed.
- **Job Safety Hazard Analysis** – Workplace Job Safety Hazard Analyses (JSHAs) will be utilized when safety work can only be executed outside the framework of safety procedures, or when a task at hand has not been executed at the site previously.
- **Safety Committee** – Site Safety Committee meets monthly, all departments have an active committee member and are represented, purpose is to communicate safety related information up and down through the organization and to drive safety issues remediation. All safety related issues/incidents will be discussed at the daily Plan of the Day (POD) meeting and or Managers meeting and tracked through resolution and closure.
- **Reporting** – Safety issues/incidents will be brought forward through written communications (e.g., emails, text messages), through verbal communications, and through the Incident Tracking/Condition Reporting system.
- **Improvements** – Safety improvement suggestions will be communicated directly with the associate’s team, supervisor, manager, and with the Palisades site Safety Representative. Safety suggestions that are deemed feasible, reasonable, and/or required will be tracked for management approval, funding, and through to completion.
- **Training** – Safety-related training will focus on general safety awareness and including, but not limited, to multiple topics such as asbestos, lead, fire prevention and protection, control of combustibles, hazard identification, mitigation, and elimination, Personal Protective Equipment (PPE), Blood Borne pathogen safety and prevention.
- **Employee Concerns Program** – Holtec values an environment for raising concerns. A safety conscious work environment is maintained where personnel feel free to raise

safety concerns without fear of retaliation, intimidation, harassment, or discrimination and where leaders take ownership when receiving and responding to concerns. Holtec maintains a fleet Employee Concerns Program (ECP) for associates to raise concerns safety or otherwise outside of the management structure. Palisades has reestablished and hired an on-site ECP manager to be a direct point of contact for associates and contractors to confidentially raise concerns outside of the traditional organizational reporting structure.

b. Construction Jobs

Commitment C3b.1 Holtec commits to ensure our subcontractors pay competitive wages and benefit rates benchmarked against local Davis-Bacon prevailing wages per the contract.

Commitment C3b.2: Holtec will ensure the highest standards of construction site health and safety, including site free of harassment and discrimination. See Commitment C3a.3.

D. Diversity, Equity, Inclusion, and Accessibility

As a minority-owned business, Holtec is committed to promoting diversity, equity, inclusion, and accessibility (DEIA) across all aspects of the repowering project, carrying those values forward during the plant's repower and continued operation. Holtec recognizes the importance of diverse perspectives in decision-making and will actively seek input from underrepresented groups to ensure their voices are heard, including associates, contractors, and external stakeholders.

Supplier Diversity

Holtec International prides itself on the strong relationships it holds with its stakeholders, vendors, and the communities that it serves. We value diversity in heritage, background, lifestyle, and thought. Holtec has long been a certified Minority Business Enterprise (MBE), and early in 2021 we expanded our efforts by designating a Supplier Diversity Manager, who immediately implemented a program to identify and foster Tier 1 and Tier diverse suppliers.

This program underscores our commitment to equal opportunity, sustaining and enhancing the economic development of small businesses and diverse organizations in their communities, and aligns with programs and policies that are becoming the norm in our industry and our nation.

Our first goal was to establish a baseline and gain an understanding of our existing vendors that are certified with recognized diversity classifications. A cross-functional Holtec team developed a basic online questionnaire and application to compile and analyze data, as well as a means of inputting this information into our existing vendor database. Since then, we have incorporated questions regarding small business and minority small business designations into our on-line Supplier Registration form, which then integrates into our vendor database.

Holtec International was the 2023 recipient of the TVA Prime Supplier of the Year Award and in 2022 received the Entergy Premier Vendor Award, both because of our supplier diversity efforts. Our efforts will continue to evolve with our next steps focusing on attracting more minority vendors through creative outreach efforts.

Employee Resources

Like most U.S. commercial nuclear power plants, Palisades is a large veteran employer that attracts workforce from the U.S. Navy and the other branches of the U.S. Armed Forces. Holtec will reimplement an on-site DEIA Council, an associate-driven organization to keep DEIA issues and recommendations at the forefront and raise with site managers. Holtec will also support associate engagement through well-established national organizations such as Women In Nuclear (WIN) and North American Young Generation in Nuclear (NAYGN), which promote career development opportunities, community engagement, and outreach.

Job Promotion

Holtec is working with its community partners to improve access to jobs for local and underrepresented workers, including DAC residents. Those engagements include workforce development organization Kinexus Group of Benton Harbor, Michigan, which provides career training and job placement services to Berrien, Cass, and Van Buren counties. Holtec is also in dialogue with Lake Michigan College of Benton Harbor and South Haven, Michigan, on skill-based certification programs to establish a talent pipeline from within the local community. Holtec has met with DAC entities to seek feedback and understanding on local employment opportunities and how to best attract workers from those plant stakeholder communities.

DRAFT

E. Justice40 Initiative

The repowering of the Palisades Nuclear Power Plant will advance the U.S. Department of Energy's equity, environmental, and energy justice priorities in several ways, aligning with the Department's commitment to the Justice40 initiative and supporting energy communities. Those investments made in the repowering of Palisades will advance economic prosperity, public health, and environmental well-being within these communities. Our commitment seeks to empower and uplift these communities. While many of the benefits of repowering will be immediately felt and are quantifiable during the restart project (e.g., hiring associates and contractors) it is important to note that many of the community benefits will be actualized over the long-term operation, including increased energy reliability and climate change mitigation.

For purposes of informing the Palisades CBP, disadvantaged community (DAC) data was derived from the White House Council on Environmental Quality's (CEQ) Climate and Economic Justice Screening Tool (CEJST), the U.S. Census Bureau, and the MiEJScreen mapping tool which was developed by the Michigan Department of Environment, Great Lakes, and Energy's (EGLE) Office of the Environmental Justice Public Advocate in cooperation with the state's Interagency Environmental Justice Response Team Data and Research Workgroup.

1. A decrease in energy burden

Benefit E1.1: Energy price volatility and reliability concerns can have significant and adverse effects on disadvantaged and low-income communities. These communities are particularly vulnerable to fluctuations in energy prices due to limited financial resources and often lack access to affordable energy-efficient technologies. Long-term energy prices are unpredictable, subject to market demand, availability of resources, planned and unplanned outages, supply chains, and policymaking among other factors.

Michigan, like many other states, has been transitioning away from coal-fired power plants to reach clean climate goals and reduce harmful greenhouse gas emissions. For Michigan, coal plants were once the dominant contributor to the state's generation portfolio and historically known for their high reliability factor, albeit lower than that of nuclear power.

In support of the Palisades repowering and future operation, Holtec has entered a long-term power purchase agreement (PPA) with two rural, not-for-profit energy cooperatives – Wolverine Power and Hoosier Energy – who will purchase the plant's emissions-free baseload generation. That agreement not only ensures the plant's operational safety and reliability, economic viability, and debt service, but provides long-term price stability for an asset that is both baseload generation and supports the state's clean climate goals.

DAC that will benefit: The clean and reliable generation and capacity provided by Palisades will benefit residential, commercial, and industrial energy customers in MISO,

which constitutes the vast majority of Michigan's lower peninsula, covering numerous DACs.

How benefits will be delivered: Long-term price stability and energy reliability will be delivered by the Palisades PPA offtaker to its customers.

When benefit will be delivered: Over the course of the plant's long-term operation and duration of the PPA.

Milestones toward benefit delivery: On September 12, 2023, Holtec announced a long-term PPA with Wolverine Power Cooperative and Hoosier Energy, two rural, not-for-profit energy providers. The foundation of this partnership is a long-term, multi-decade PPA with Wolverine committing to purchase up to two-thirds of the carbon-free power generated by Palisades for its Michigan-based rural electric cooperatives. Wolverine's non-profit rural electric cooperative project partner, Hoosier Energy, will purchase the balance. Both Wolverine and Hoosier operate within MISO.

Metrics to track and report on benefits: Benefits will be actualized over the long term of the plant's operation and PPA.

Community-based organization(s) involved in identifying or negotiating benefits or developing plans for benefit delivery: Customer benefits will be the result of the PPA negotiated between plant owner Holtec and offtakers Wolverine and Hoosier.

2. A decrease in environmental exposure and burdens

Benefit E2.1: Palisades provides greenhouse-gas-emissions-free generation, which is essential to supporting long-term public health and achieving the State of Michigan's clean climate goals¹. The power to replace Palisades has been estimated at 4.47 million tons of CO₂ emissions annually – in addition to other greenhouse gas pollutants emitted by fossil fuel plants such as sulfur dioxide (SO₂), nitrogen oxides (NO_x), and particulate matter – equating to more than 900,000 cars on the road. Nuclear power plants like Palisades do not emit these pollutants during electricity generation, contributing to improvements in local air quality and public health. In addition to the direct socioeconomic benefits of Palisades, the plant's contribution to mitigate the human cost of climate change is significant².

The repowering of Palisades provides a bridge of clean, reliable generation for the State of Michigan as it transitions from fossil-fuel generation – with most of the state's baseload, coal-fired generation scheduled to close by 2030 – to renewables and other advanced technologies. Carbon-free, baseload generation is essential to public health as well as Michigan's economic competitiveness and attracting future employers as well as supporting the growth of electric vehicles and EV infrastructure, which Governor Whitmer's administration has stated is a priority³.

¹ <https://www.michigan.gov/egle/about/organization/climate-and-energy/mi-healthy-climate-plan>

² <https://screeningtool.geoplatform.gov/en/#11.01/42.2708/-86.2962>

³ <https://www.michigan.gov/whitmer/news/press-releases/2023/04/25/whitmer-announces-launch-of-michigan-community-ev-toolkit-to-support-local-governments>

DAC that will benefit: All DACs that would be disproportionately impacted by the fossil-fueled generation required to offset the loss of Palisades's baseload, emissions-free generation. Of most immediate benefit is the surrounding plant community of Allegan, Berrien, Cass, and Van Buren counties. This is especially important for communities at higher risk for asthma and cardiovascular disease, which make residents vulnerable to the impact of climate change.

How benefit will be delivered: Benefit is direct through the safe, reliable, and emissions-free operation of the plant in helping mitigate the effects of climate change to which other energy resources contribute.

When benefit will be delivered: Following repowering and over the duration of the plant's operation.

Milestones toward benefit delivery: Completion of repowering.

Metrics to track and report on benefits: The benefits of reducing greenhouse gas emissions and air pollutants is well understood. Palisades is vital in Michigan's clean energy transition.

3. An increase in quality job creation, the clean energy job pipeline, and job training for individuals

Benefit E3.1: During operation, Palisades employed approximately 600 full-time, highly skilled jobs with an average salary of approximately \$117,000, which greatly exceeds the area median annual household. Those jobs directly provide a major economic stimulus to the local and regional economies through wages spent on goods, services, and housing as well as sales and income taxes. A study by the Economic Growth Institute at the University of Michigan determined the premature shutdown of Palisades resulted in an annual loss of \$259 million in labor income and value added (direct, indirect, and induced across industries) for Southwest Michigan.

In addition to direct full-time associates, the plant brings more than an additional 1,000 specialty workers into the community every 18 months to support scheduled refueling and maintenance outages. Those outages further support the region's economy and have been essential to the area's hospitality, lodging, and service industries.

DAC that will benefit: Greater Southwest Michigan region – including Covert Township, South Haven, and Benton Harbor – and extending beyond the tri-county region to both urban and rural DACs.

How benefits will be delivered: Directly through the ongoing hiring of more than 300 new associates to the plant's full-time, permanent workforce. The repowering will also support more than 1,000 specialized supplemental workers, which is typical of the plant's regularly scheduled refueling and maintenance outages that occur every 18 months. Many of those outage workers are hired from within the local community and through utilizing area union halls. The indirect benefit will be delivered to the greater Southwest Michigan region, which benefits from the influx of tax revenues and associated spending.

When benefit will be delivered: Hiring of full-time, permanent associates commenced in September 2023 with an emphasis on hiring future plant Operators and has continued across all plant areas. The workforce and contractors will be maintained throughout the repower and during plant operation.

Milestones toward benefit delivery: Currently in process.

Metrics to track and report on benefits: Associates hired to populate organizational chart. Geographic disbursement of associates, current and future.

Community-based organization(s) involved in identifying or negotiating benefits or developing plans for benefit delivery: Holtec has been engaged with regional workforce development organizations and trade unions.

Beyond the plant's repowering, Holtec will work with local educational institutions – including local public schools and the Van Buren Intermediate School District – to help build the local clean energy job pipeline. During its operation, the plant had partnered with Lake Michigan College (LMC) in Benton Harbor, Michigan, to develop a technical career training curriculum for students entering the nuclear energy industry. Holtec has met with LMC's Workforce and Career Readiness department to discuss the potential revitalization of that program as well as developing a skill-based curriculum (as opposed to two- or four-year degree based) to meet the plant and region's workforce needs. The Michigan Department of Labor and Economic Opportunity will be another partner in this effort.

4. Increases in clean energy enterprise creation and contracting (e.g., minority-owned or diverse business enterprises)

Benefit E4.1: As a minority-owned business, Holtec is committed to supporting partnership opportunities with high-performing, price-competitive enterprises that are owned or led by minorities or underrepresented groups. Holtec is also committed to diversity and inclusion within the company's own workforce.

How benefits will be delivered: Direct by applying DEIA values in hiring and contracting processes. Growing site and company mindfulness through establishment of associate-driven DEIA council to uphold company values and ensure all associates can contribute.

Milestones toward benefit delivery: Formation of associate-driven DEIA council.

5. An increase in energy resilience

Benefit E5.1: The repowering of Palisades will provide greater long-term energy resilience to DACs throughout the greater region, lessening the likelihood of long-duration electrical outages that have a disproportionate impact on disadvantaged, elderly, and health-sensitive community groups. During its operation, Palisades had a capacity factor of more than 90 percent, which exceeds the typical reliability expected of both traditional fossil fuel and renewable sources.

DAC that will benefit: Grid resilience benefits all residents and businesses.

How benefits will be delivered: Directly through the plant's return to operation, providing increased electric reliability to all end users.

When benefit will be delivered: Benefit of improved grid reliability and increased resilience will be actualized after completion of the repowering and over the duration of the plant's operation.

6. Support for vital public and community services/resources

Benefit E6.1: During regular operation, Palisades was one of the region's largest, highest-paying employers as well as one of the largest local taxpayers. During operation, tax dollars were used to support local units of government and public services – such as police, fire, emergency response, public health, transportation, senior services, and veteran care – as well as public education.

DAC that will benefit: The most significant share of Palisades's property taxes is disbursed to those supporting disadvantaged populations. Covert Township and Covert Public Schools (see appendix) receive 50.5% of the plant's paid tax revenues. The Van Buren Intermediate School District receives 14.24%, serving students with disabilities, career/technical training skills, migrant worker families and ESL programming, as well as learning services for Covert Public School high school seniors and juniors. 14.8% of revenues go to Van Buren County (roads, transportation, public safety, public health, general operations). 4.71% of tax revenues are paid to Lake Michigan College, which has a campus in the South Haven-Covert Township DAC and is based in the DAC Benton Harbor, Michigan. 2.25% go to the Van Buren District Library, including its Covert Township Branch. 12.48% supports state education. The remaining revenues support other countywide services, including Senior Services, the Van Buren Conservation District, and veterans' services.

How benefits will be delivered: The considerable benefits of increased property taxes are direct to the local community. Palisades property taxes are determined on an annual basis by the Tax Assessor who establishes the value of the property, real and personal. Millage rates are applied to that assessed value to determine the plants property tax bill, which is paid in the winter and summer.

When benefit will be delivered: Holtec is committed to being a good community partner and will work with appropriate entities to determine a fair assessed value.

Milestones toward benefit delivery: The plant's return to service.

Metrics to track and report on benefits: Future property tax payments will be decided through the annual assessment process.

Community-based organization(s) involved in identifying or negotiating benefits or developing plans for benefit delivery: Covert Township and Van Buren County are the parties directly involved in the assessment process.

Potential Environmental Impact

The Palisades Nuclear Power Plant was constructed in the late 1960s and provided safe, carbon-free, and reliable generation from December 1971 to its early shutdown in May 2022. The plant operated in the U.S. Nuclear Regulatory Commission's (NRC's) highest safety category and was recognized as a top performing plant within the U.S. commercial nuclear power industry. Its existence and operation are well established and thus repowering would have no new impact. Activities related to the restart fit within the plant's current footprint, with primary equipment and system modifications, upgrades, inspections, and repairs occurring within the already-existing plant.

The health and safety of its workforce, the community, and environment are the plant's highest priorities. Palisades maintains robust safety and environmental monitoring programs to ensure the health and safety of its workforce, the surrounding community, and the environment. Plant activities and reporting requirements comply with regulations set forth by the NRC, the U.S. Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), and agencies within the State of Michigan. Environmental sampling data is made publicly available through the NRC.

In 2023, the NRC formed a Palisades Nuclear Plant Restart Panel, which "will guide the staff efforts to review, inspect, and confirm that [Palisades] is ready to be returned to an operating facility. The Restart Panel will help coordinate licensing, inspection, and oversight activities across the agency to ensure that all aspects of the PNP restart project are meeting the NRC's safety, security, and environmental requirements."⁴

During operation, the NRC maintains a full-time, on-site presence at the plant led by a Senior Resident Inspector and Resident Inspector. Those Residents are supported by teams of NRC personnel who routinely visit the site for regularly scheduled inspections. Like all nuclear power plants in the United States, Palisades in operation annually undergoes thousands of hours of independent inspection and oversight by the NRC to ensure the plant adheres to the federal government's highest safety standards. The NRC's reports are regularly made available to the public and the agency hosts an annual assessment meeting for every operating plant. Prior to its shutdown, Palisades operated in the NRC's highest safety category (i.e., Column I of the Reactor Oversight Process Action Matrix⁵) based on all information from inspections and performance indicators.

Radiological Material Management

For the repowering, plant owner Holtec will rely upon its vast network of industry suppliers, which supported the plant during its operation. Like most nuclear power plants, Palisades uses uranium as fuel to initiate a controlled nuclear fission process. The heat generated through this process is converted into electricity through the production of steam. To meet domestic

⁴ <https://www.nrc.gov/docs/ML2329/ML23297A053.pdf>

⁵ <https://www.nrc.gov/reactors/operating/oversight/actionmatrix-summary.html>

nuclear fuel demand, the U.S. commercial nuclear industry typically relies on uranium imports, primarily from Canada and Australia.

Like other U.S. nuclear power plants, Palisades is responsible for maintaining, monitoring, and protecting the spent fuel that it has produced during normal plant operation. Holtec International is the largest domestic and international supplier of spent fuel storage solutions to the commercial nuclear power industry. At Palisades, that spent fuel is safely stored in dry fuel storage canisters located on two Independent Spent Fuel Storage Installation (ISFSI) pads. The canisters and ISFSIs are maintained in compliance with Palisades licensing requirements with NRC oversight. Like other nuclear power plants, the spent fuel will remain at Palisades until it is ready to be received by the federal government for transportation to an interim or permanent repository. In 2022, Palisades hosted a spent fuel transportation taskforce⁶ from the U.S. Department of Energy to discuss the eventual removal of spent fuel from Palisades. That visit included community stakeholder roundtable discussions involving Palisades owner Holtec, state, local, and Tribal representatives and members of the public. Michigan law prohibits the intrastate transportation of spent fuel from one plant to another.

⁶ Revised 2023 report pending publication by the U.S. Department of Energy:
<https://www.energy.gov/ne/articles/nuclear-power-plant-infrastructure-evaluations-removal-spent-nuclear-fuel>

F. Summary Table

Holtec recognizes our role as a responsible corporate citizen. We also recognize and deeply appreciate the significant importance that strong external support for the Palisades repower has had and will continue to play in future operation. The above CBP, which is designed to evolve based on changing needs, is a testament to our commitment to making a positive impact in the communities we serve. With a focus on maintaining the well-being of our workforce, partnering with the communities that we serve, and maintaining meaningful engagement with external stakeholders, this plan outlines our belief and commitment that the repower aligns with the broader social and environmental goals we share. Our dedication to these values underscores our vision for a better and more sustainable future for all.

Below is a summary of the deliverable benefits outlined in the Palisades Community Benefits Plan:

| Category and Commitment | Impacted Parties | Status | Milestones |
|----------------------------------------------------|----------------------------------------------------------------------------------------------------|----------|------------------------------------------------------------------------------------------------------------------------------------------|
| Community and Labor Engagement | | | |
| Collective Bargaining Agreements (CBAs) | Utility Workers Union of America (UWUA) and United Government Security Officers of America (UGSOA) | Complete | Signed CBAs active and in place. Renewal of CBAs prior to restart (~Q4 2025). |
| Project Labor Agreement (PLA) | 15 PLA signatory trade unions noted above under "Community and Labor Engagement" | Complete | PLA for repower activities successfully executed February 2024. |
| U.S. Nuclear Regulatory Commission Public Meetings | External stakeholders, community members | Ongoing | Since Q3 2023, Holtec has participated in a series of public meetings with NRC staff concerning the reauthorization of power operations. |

| | | | |
|-------------------------------------|--------------------------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | <p>Holtec is committed to continue to attend and/or participate in future NRC Palisades Restart Panel public meetings and pre-submittal meetings as appropriate and depending upon the particular meeting format and purpose.</p> |
| Public Open Houses | External stakeholders, community members | In Progress | <p>Holtec intends to host two informational public open houses every year, with plant subject matter experts available to discuss repower-related activities.</p> <p>First open house tentatively scheduled for June 2024.</p> |
| Public Inquiry | Community members | In Progress | <p>Revised and updated Palisades website (www.palisadespower.com) targeted for completion June 2024.</p> <p>The site will provide public information on plant, repower, emergency preparedness, career opportunities, and public comment and inquiry.</p> <p>Information will be updated on a timely, as-needed basis. Public comment and inquiry will be monitored by Holtec Government Affairs and Communications team.</p> |
| Monthly Stakeholder Conference Call | Federal, state, local, Tribal stakeholders | Ongoing | <p>Held monthly to provide formal plant status update to stakeholders and key agencies. Twelve standing</p> |

| | | | |
|---------------------------------------------------------|---------------------------------------------------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | monthly calls per year with additional “jump up” calls as needed on topics of interest. |
| Utilization of stakeholder outreach tools | Federal, state, local, Tribal stakeholders; community members | Ongoing | Continuation of regular (weekly/monthly/ad hoc) touchpoints through and into return to operations. Inform on project status and plant activities; solicit feedback and questions. |
| | | | |
| Investing in Job Quality and a Skilled Workforce | | | |
| Competitive wages and benefits | Workforce – bargaining unit and non-bargaining unit | Ongoing | Continue to maintain during restart and during operations. |
| Workforce education and hiring | Workforce – BU/NBU | Ongoing | Restoration of site Training program and hiring of pedigreed training personnel (Complete). Industry training program accreditation (Ongoing). Benefits in place for new associates (Complete). Active hiring to continue across most disciplines through 2025. Tracking job creation data to demonstrate clean energy job pipeline data (Ongoing). |
| Workplace safety and health plans | Workforce – BU/NBU, contractors | Complete; Ongoing | On-site ECP coordinator hired (Q12024). Reimplementation of policies/procedures for operations (Ongoing). |
| | | | |

| Diversity, Equity, Inclusion, and Accessibility | | | |
|--------------------------------------------------------------------------------|-------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| On-site DEIA Council formation | Workforce – BU/NBU, contractors, suppliers, potential hires | In Progress | Formation of an associate-driven DEIA Council to drive DEIA-related issues and elevate to plant management (Q1 2025) |
| Job training partnerships, career pipeline, including DACs and local residents | Local K-12, ISD, and institutes of higher education | In Progress | Active discussions with local educational institutions to develop a local talent pipeline to support future careers and plant operations. Exploring restoration of internship programs. |
| Justice40 Initiative | | | |
| Decrease energy burden | DACs, residential and C&I customers | In Progress | Price stability and generation reliability ensured by long-term PPA (Complete). Actualized beginning upon return to operation, realized over long-term operation. |
| Decrease environmental exposures and burdens | DACs, vulnerable community populations | In Progress | Offsetting global emissions of greenhouse gases. Upon return to operation, realized over long-term operation. |
| Increase in quality job creation | DACs | Ongoing | Continued engagement of workforce development and public education partners. Hiring in progress and tracking data. |
| Increase in energy resilience | DACs, residential and C&I customers | In Progress | Increased energy reliability through deployment of carbon-free, baseload generation from a proven generator. Upon return to operation, realized over long-term operation. Quantifiable in tracked |

| | | | |
|-----------------------------------------------------------|------------------------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | megawatt-hours and online reliability factor. |
| Support for vital public and community services/resources | DACs, primarily local taxing units | Ongoing | Upon repowering and through future operation with restoration of plant property tax revenues, as determined by the assessment process. Taxes paid in Winter/Summer. Distribution of tax payments to local entities based on milage. |

DRAFT

G. Appendix

Disadvantaged Communities and Federally Recognized Tribes

Below are the federally recognized DACs/Federally Recognized Tribes within the near vicinity of the Palisades Nuclear Power Plant, the location of its workforce, and immediate economic footprint. Plant engagement is not confined to the federal, state, Tribal, and local entities represented by this list.

Van Buren County DACs

- Covert Township (Tract 26159010600) – *Palisades Nuclear Power Plant location*
- South Haven Township (Tract 26159010500)
- City of South Haven (Tract 26159010400)
- City of Hartford (Tract 26159011400)
- Hartford Township (Tract 26159011300)
- Bangor Township (Tract 26159012000)
- City of Bangor (Tract 26159012000)
- Geneva Township (Tract 26159010200)
- Columbia Township (Tract 26159010200)
- Lawrence Township (Tract 26159011300)
- Paw Paw Township (Tract 26159011800)

Northern Berrien County DACs

- City of Benton Harbor (Tract 26021000300-600, 26021002200)
- Benton Township (Tract 26021002000-500)
- Watervliet Township (Tract 26021010300)
- City of Watervliet (Tract 26021010300)

Southern Allegan County DACs

- City of Allegan (Tract 26005031200)
- Lee Township (Tract 26005031000)
- Cheshire Township (Tract 26005031000)

Cass County DACs

- City of Dowagiac (Tract 26027001900-2200)
- Silver Creek Township (Tract 26027001900)
- Pokagon Township (Tract 26027002200)
- Wayne Township (Tract 26027002000)
- LaGrange Township (Tract 26027002100)

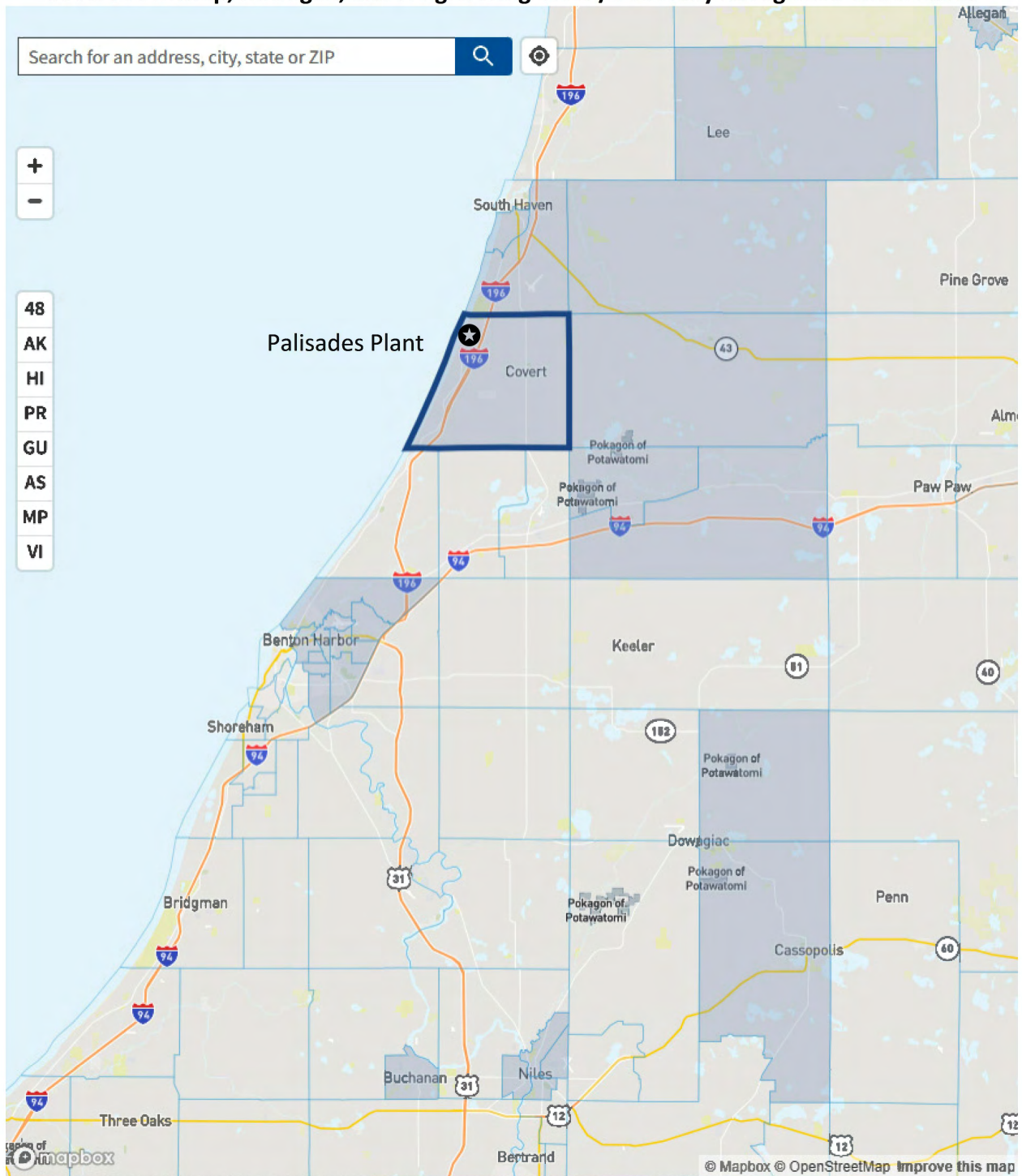
Federally Recognized Tribes

- Pokagon Band of Potawatomi (with lands including):

- Hartford Township, Van Buren County
- Bangor Township, Van Buren County
- City of Dowagiac, Cass County – *Headquarters of the Pokagon Band*
- Pokagon Township, Cass County
- Silver Creek Township, Cass County
- Wayne Township, Cass County
- LaGrange Township, Cass County
- New Buffalo Township, Berrien County

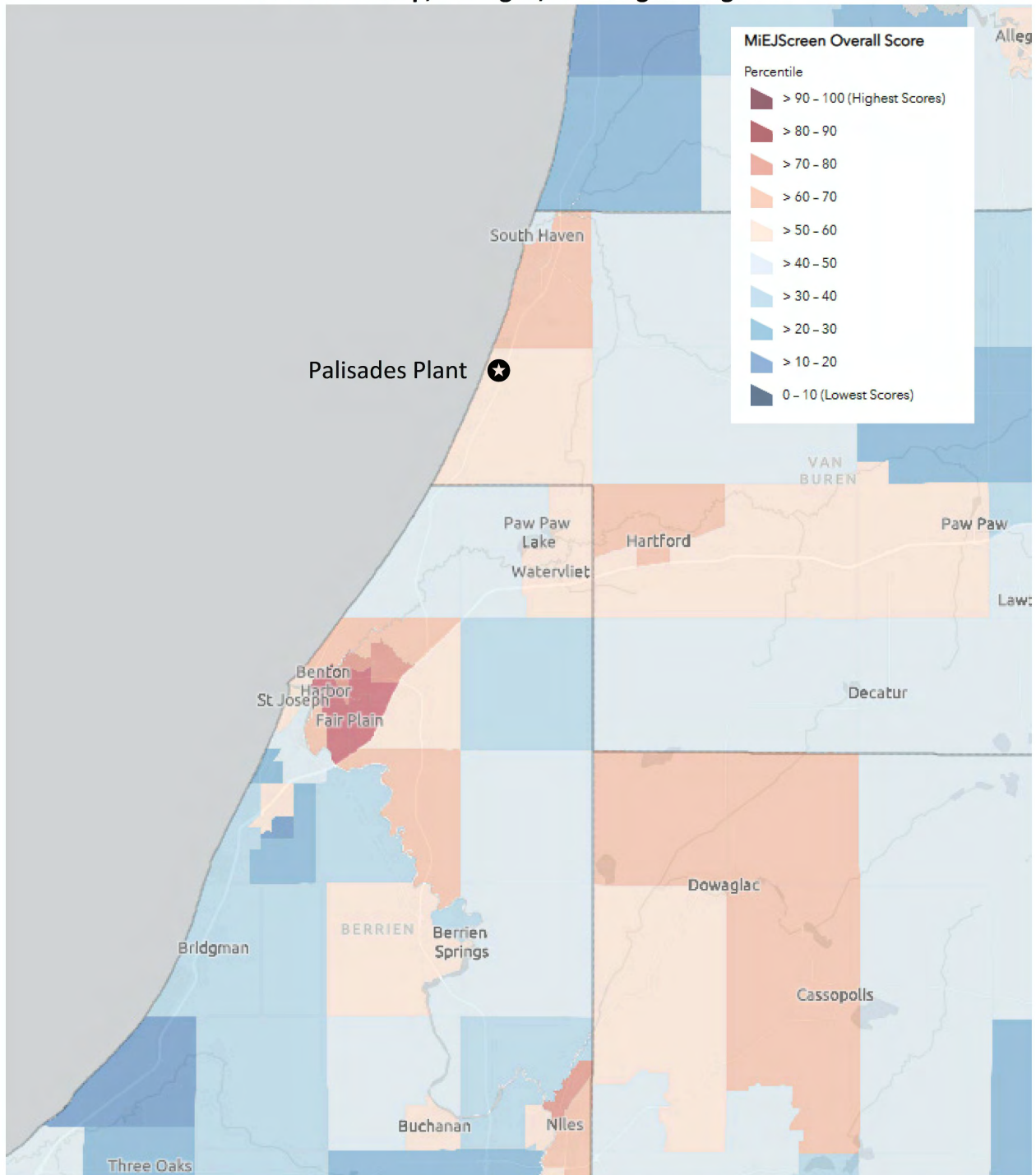
DRAFT

Climate and Economic Justice Screening Tool (CEJST) Map Covert Township, Michigan, and Neighboring DACs / Federally Recognized Tribal Lands



Source: CEJST Website (<https://screeningtool.geoplatform.gov/en/#9.37/42.1484/-86.2743>); Census tracts that are overburdened and underserved are highlighted as being disadvantaged on the map above in blue. Federally Recognized Tribes, including Alaska Native Villages, are also considered disadvantaged communities.

State of Michigan MiEScreen Map Covert Township, Michigan, and Neighboring DACs



Source: MiEScreen Mapping Tool (<https://egle.maps.arcgis.com/apps/webappviewer/index.html?id=b100011f137945138a52a35ec6d8676f>); MiEScreen scoring is conducted on a scale of 0 to 100 based on the categories of environment exposure and environmental effects (sub scored as environmental conditions) and sensitive populations and socioeconomic factors (sub scored as population characteristics), which determine a final composite score. A higher MiEScreen score (indicated in red/orange) indicates a greater number of environmental and social justice indicators.

Community Snapshot: Covert Township, Michigan

Summary

Covert Township is home to the Palisades Nuclear Power Plant. The township and the Covert Public School system are the two public entities most greatly and directly impacted by the loss of the plant's declining property tax payments. Covert is designated as a disadvantaged community because it meets more than one burden threshold (as identified by the CEJST⁷) and the associated socioeconomic threshold. CEJST and MiEJScreen both highlight the area's socioeconomic challenges, which include socioeconomic challenges (e.g., low household income, high poverty, language barriers, educational attainment) and sensitive populations (e.g., increased rates of medical conditions that may be increased by environmental factors), which are detailed below.

Census Tract Information: Covert Township, Michigan

Number: 26159010600

County: Van Buren County

State: Michigan

Population: 2,869

Demographics: Covert Township, Michigan

Race / Ethnicity

| | |
|----------------------------------|-----|
| White | 48% |
| Black or African American | 20% |
| American Indian/Alaska Native | 0% |
| Asian | 0% |
| Native Hawaiian/Pacific Islander | 0% |
| Other | 12% |
| Two or more races | 6% |
| Hispanic or Latino | 27% |

2020 U.S. Census Demographics: Covert Township, Michigan⁸

Income and Earnings

\$32,036 median household income in Covert Township (**45% below** median household income in Van Buren County, Michigan)

Poverty

27.4% of all residents in Covert Township (more than twice the overall rate of poverty in Van Buren County, Michigan)

Education Attainment

⁷ CEJST: <https://screeningtool.geoplatform.gov/en/#11.01/42.2708/-86.2962>

⁸ [https://data.census.gov/profile/Covert township, Van Buren County, Michigan?g=0600000US2615918560](https://data.census.gov/profile/Covert%20township,%20Van%20Buren%20County,%20Michigan?g=0600000US2615918560)

52.7% lower attainment of bachelor's degree or higher in Covert Township than in Van Buren County, Michigan (10.6% vs 22.4%, respectively)

CEJST Tract Disadvantaged Data Points: Covert Township, Michigan

Low Income

Covert Township ranks in the **87th percentile** (above 65th percentile) for people in households where income is less than or equal to twice the federal poverty level, not including students enrolled in higher ed.

Energy Cost

Covert Township ranks in the **97th percentile** (above 90th percentile) for average annual energy costs divided by household income, a figure that directly correlates to low income and earnings levels within the township.

Health

Covert township ranks in the **94th percentile** (above 90th percentile) for share of people who have been told they have **asthma**, the **93rd percentile** (above 90th percentile) for share of people ages 18 years and older who have **diabetes** other than diabetes during pregnancy, and the **91st percentile** (above 90th percentile) for share of people ages 18 years and older who have been told they have **heart disease**.

Transportation

Covert Township ranks in the **94th percentile** (above 90th percentile) for transportation barriers, determined as the average of relative cost and time spent on transportation.

Water and Wastewater

Covert Township ranks in the **97th percentile** (above 90th percentile) for modeled toxic concentrations at parts of streams within 500 meters.

Workforce Development

Covert Township residents (**28 percent**) ages 25 years or older whose high school education is less than a high school diploma.

MiEJScreen Report⁹

⁹ <https://egle.maps.arcgis.com/apps/webappviewer/index.html?id=b100011f137945138a52a35ec6d8676f>

Reporting by the State of Michigan reached similar conclusions with respect to the environmental and population characteristics of Covert Township:

MiEJ Composite Score: 59th percentile

Environmental Conditions: 31st percentile

Exposure 31st percentile

Environmental Effects 38th percentile

Population Characteristics: 79th percentile

Sensitive Populations 65th percentile

Socioeconomic Factors 96th percentile

DRAFT

Community Snapshot: City of South Haven (DAC Tract), Michigan

Summary

The City of South Haven is located north of the Palisades Nuclear Power Plant of Covert Township. The City DAC Tract is designated as a disadvantaged community because it meets more than one burden threshold (as identified by the CEJST¹⁰) and the associated socioeconomic threshold. CEJST and MiEJScreen both highlight the area's challenges, which include socioeconomic challenges (e.g., low household income, educational attainment), environmental risk factors, and sensitive populations, which are detailed below.

Census Tract Information: City of South Haven, Michigan (DAC Tract)

Number: 26159010400

County: Van Buren County

State: Michigan

Population: 2,645

Demographics: City of South Haven, Michigan (DAC Tract)

Race / Ethnicity

| | |
|----------------------------------|-----|
| White | 68% |
| Black or African American | 19% |
| American Indian/Alaska Native | 0% |
| Asian | 0% |
| Native Hawaiian/Pacific Islander | 0% |
| Other | 0% |
| Two or more races | 5% |
| Hispanic or Latino | 7% |

CEJST Tract Disadvantaged Data Points: City of South Haven, Michigan (DAC Tract)¹¹

Low Income

The City of South Haven (DAC Tract) ranks in the **68th percentile** (above 65th percentile) for people in households where income is less than or equal to twice the federal poverty level, not including students enrolled in higher ed.

Water and Wastewater

The City of South Haven (DAC Tract) ranks in the **95th percentile** (above 90th percentile) for density of leaking underground storage tanks and number of all active underground storage tanks within 1,500 feet of the census tract boundaries.

¹⁰ CEJST: <https://screeningtool.geoplatform.gov/en/#12.04/42.38508/-86.27896>

Workforce Development

South Haven City residents (**13 percent**) ages 25 years or older whose high school education is less than a high school diploma.

MiEJScreen Report¹²

Reporting by the State of Michigan reached similar conclusions with respect to the environmental and population characteristics of the City of South Haven (DAC Tract):

| | |
|------------------------------|-----------------------------|
| MiEJ Composite Score: | 61 st percentile |
| Environmental Conditions: | 46 th percentile |
| <i>Exposure</i> | 38 th percentile |
| <i>Environmental Effects</i> | 75 th percentile |
| Population Characteristics: | 68 th percentile |
| <i>Sensitive Populations</i> | 52 nd percentile |
| <i>Socioeconomic Factors</i> | 81 st percentile |

¹² <https://egle.maps.arcgis.com/apps/webappviewer/index.html?id=b100011f137945138a52a35ec6d8676f>

Community Snapshot: South Haven Charter Township, Michigan

Summary

South Haven Charter Township is located north of the Palisades Nuclear Power Plant of Covert Township. The Township is designated as a disadvantaged community because it meets more than one burden threshold (as identified by the CEJST¹³) and the associated socioeconomic threshold. CEJST and MiEJScreen both highlight the area's challenges, which include socioeconomic challenges (e.g., low household income, educational attainment), environmental risk factors, and sensitive populations (health risks), which are detailed below.

Census Tract Information: South Haven Township, Michigan

Number: 26159010500

County: Van Buren County

State: Michigan

Population: 3,368

Demographics: South Haven Township, Michigan

Race / Ethnicity

| | |
|----------------------------------|-----|
| White | 73% |
| Black or African American | 4% |
| American Indian/Alaska Native | 0% |
| Asian | 0% |
| Native Hawaiian/Pacific Islander | 0% |
| Other | 0% |
| Two or more races | 0% |
| Hispanic or Latino | 23% |

CEJST Tract Disadvantaged Data Points: South Haven Township, Michigan¹⁴

Low Income

South Haven Township ranks in the **80th percentile** (above 65th percentile) for people in households where income is less than or equal to twice the federal poverty level, not including students enrolled in higher ed.

Health

South Haven Township ranks in the **92nd percentile** (above 90th percentile) for the share of people ages 18 years and older who have been told they have **heart disease**.

¹³ CEJST: <https://screeningtool.geoplatform.gov/en/#10.65/42.3752/-86.2681>

Water and Wastewater

South Haven Township ranks in the **94th percentile** (above 90th percentile) for modeled toxic concentrations at parts of streams within 500 meters.

Workforce Development

South Haven Township residents (**15 percent**) ages 25 years or older whose high school education is less than a high school diploma.

MiEJScreen Report¹⁵

Reporting by the State of Michigan reached similar conclusions with respect to the environmental and population characteristics of South Haven Township:

| | |
|------------------------------|-----------------------------|
| MiEJ Composite Score: | 63 rd percentile |
| Environmental Conditions: | 48 th percentile |
| <i>Exposure</i> | 40 th percentile |
| <i>Environmental Effects</i> | 75 th percentile |
| Population Characteristics: | 70 th percentile |
| <i>Sensitive Populations</i> | 48 th percentile |
| <i>Socioeconomic Factors</i> | 88 th percentile |

¹⁵ <https://egle.maps.arcgis.com/apps/webappviewer/index.html?id=b100011f137945138a52a35ec6d8676f>

Community Snapshot: Palisades-Area Public School Systems

2020-2021/22 data for public school systems near to the Palisades Nuclear Power Plant provided by MI School Data¹⁶, the State of Michigan's official source for education data. directly benefits Covert Public Schools as well as the Van Buren Intermediate School District of Lawrence, Michigan, which provides career technical training and supportive services available to all students within Van Buren County. Plant associates often live, pay local taxes, and/or have family that attends school within these public schools.

Covert Public Schools, Covert, Michigan

| | |
|----------------------------|--------|
| Graduation Rate | 68.75% |
| K-12 Enrollment | 321 |
| Economically Disadvantaged | 100% |
| Students with Disabilities | 16.2% |

Student Body Demographics

| | |
|------------------------|--------|
| Hispanic/Latino | 65.11% |
| African American/Black | 14.33% |
| White | 14.02% |
| Two or More Races | 5.3% |
| Native American | 0.93% |
| Asian | 0.31% |

South Haven Public Schools, South Haven, Michigan

| | |
|----------------------------|--------|
| Graduation Rate | 78.03% |
| K-12 Enrollment | 1,818 |
| Economically Disadvantaged | 65.6% |
| Students with Disabilities | 14.8% |

Student Body Demographics

| | |
|------------------------|--------|
| White | 61.44% |
| Hispanic/Latino | 16.89% |
| Two or More Races | 11.28% |
| African American/Black | 9.08% |
| Asian | 0.72% |
| Native American | 0.61% |

Hartford Public Schools, Hartford, Michigan

¹⁶ <https://www.mischooldata.org/schools-at-a-glance/>

| | |
|----------------------------|--------|
| Graduation Rate | 85.56% |
| K-12 Enrollment | 1,336 |
| Economically Disadvantaged | 87.6% |
| Students with Disabilities | 12% |

Student Body Demographics

| | |
|------------------------|--------|
| Hispanic/Latino | 56.96% |
| White | 38.25% |
| Two or More Races | 1.95% |
| African American/Black | 1.5% |
| Native American | 1.2% |
| Asian | 0.07% |

Benton Harbor Area Schools, Benton Harbor, Michigan

| | |
|----------------------------|--------|
| Graduation Rate | 63.41% |
| K-12 Enrollment | 1,495 |
| Economically Disadvantaged | 96.3% |
| Students with Disabilities | 19.9% |

Student Body Demographics

| | |
|------------------------|--------|
| African American/Black | 93.11% |
| Two or More Races | 2.65% |
| Hispanic/Latino | 2.05% |
| White | 1.66% |
| Native American | 0.2% |
| Asian | 0.13% |

Bangor Public Schools, Bangor, Michigan

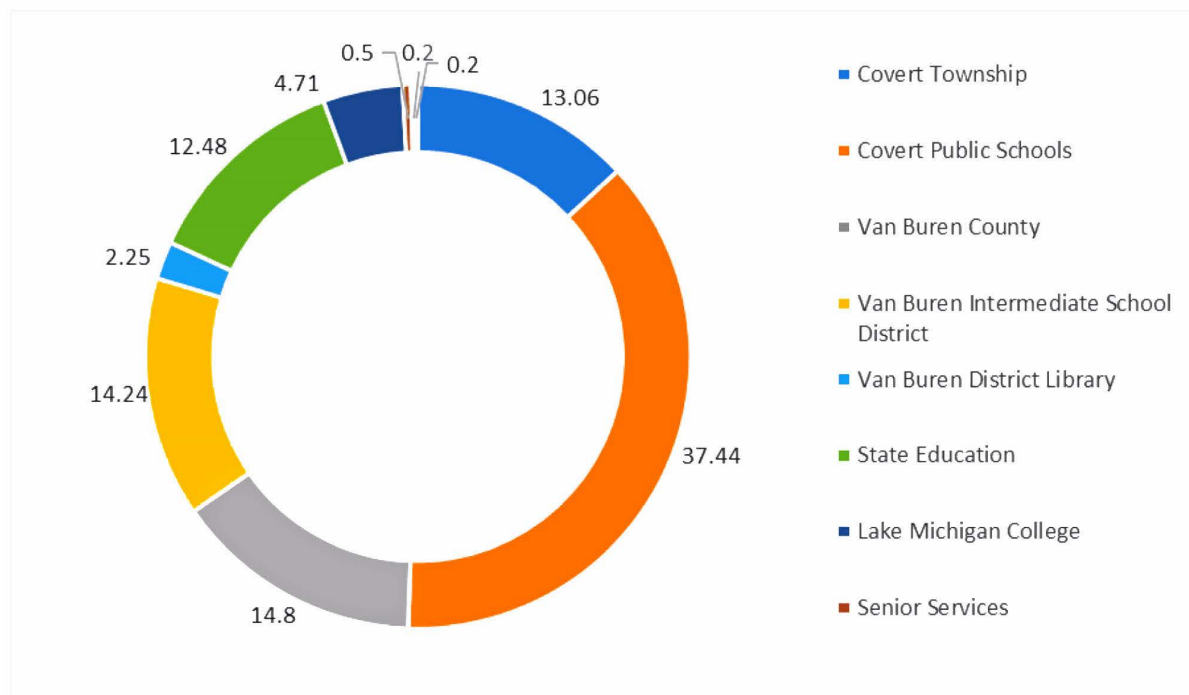
| | |
|----------------------------|--------|
| Graduation Rate | 58.23% |
| K-12 Enrollment | 1,043 |
| Economically Disadvantaged | 75.9% |
| Students with Disabilities | 14.2% |

Student Body Demographics

| | |
|------------------------|--------|
| White | 47.65% |
| Hispanic/Latino | 39.6% |
| Two or More Races | 7.48% |
| African American/Black | 4.99% |
| Native American | 0.19% |

Annual Property Tax Distribution

During regular operation, Palisades was one of the region’s largest, highest-paying employers as well as one of the largest local taxpayers. Palisades property taxes are determined on an annual basis by the Covert Township Tax Assessor who establishes the value of the property, real and personal. Millage rates are applied to that assessed value to determine the plants property tax bill, which is paid in the winter and summer. The chart below breaks down how the plant’s taxes directly benefit the local community.



The most significant share of Palisades’s property taxes support disadvantaged populations. Covert Township and Covert Public Schools (please see snapshots above) receive 50.5% of the plant’s paid tax revenues. The Van Buren Intermediate School District receives 14.24%, serving students with disabilities, career/technical training skills, migrant worker families and ESL programming, as well as learning services for Covert Public School high school seniors and juniors. 14.8% of revenues go to Van Buren County (roads, transportation, public safety, general operations). 4.71% of tax revenues are paid to Lake Michigan College, which has a campus in the South Haven-Covert Township area and is based in Benton Harbor, Michigan. 2.25% go to the Van Buren District Library, including its Covert Township Branch. 12.48% supports state education. The remaining revenues support other countywide services, including Senior Services, the Van Buren Conservation District, and veterans’ services.

Enclosure 19
HDI PNP 2024-037

Enclosure 19
HDI PNP 2024-037
Response to Request for Additional Information –
RAI-HCR-5
Regarding the Proposed Reauthorization of Power Operations of
Palisades Nuclear Plant Under
Renewed Facility Operating License No. DPR-20

NRC RAI Number: RAI-HCR-5

Provide all records of engagement and communication with the Michigan State Historic Preservation Office, Tribal Historic Preservation Office (or Native American Tribes) and/or other parties as they relate to Section 106 of the National Historic Preservation Act or cultural resources considered under NEPA.

Enclosure 2, "*Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant*," did not provide a description of communications or engagement with the State, Tribes, or other interested parties as it relates to cultural resources, only reference to a Michigan State Historic Preservation Office literature review conducted on September 11-13, 2023.

HDI Response to RAI:

Reviews conducted for the 2023 "*Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant*" of the 10 CFR 50.82 Exemption Request (ML23271A140) identified no new and significant conditions or proposed project-related activities, that would change the conclusions of the 2006 SEIS on this topic. Therefore, neither Michigan State Historic Preservation Office (MSHPO), nor any Tribal or other parties were consulted for the "*Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant*".

It should be noted that, as part of the ongoing studies for the proposed new Holtec SMR-300 units, stakeholder engagement outreach to the MSHPO, Native American Tribes and others are ongoing. These studies include an archaeological field survey and an architectural survey of the Palisades property, both of which have been submitted to the MSHPO. These reports and related correspondence are available to the NRC through the MSHPO. In addition, DOE has engaged with the MSHPO on their role in the Restart project.

Ongoing cultural and historic resource studies and correspondence are occurring with regard to the other projects. Holtec will alert NRC to responses received from MSHPO or tribal organizations while the PNP Restart EA process is ongoing.

References:

None.

Associated Attachment:

None.

Enclosure 20
HDI PNP 2024-037

Enclosure 20
HDI PNP 2024-037
Response to Request for Additional Information –
RAI-HCR-6
Regarding the Proposed Reauthorization of Power Operations of
Palisades Nuclear Plant Under
Renewed Facility Operating License No. DPR-20

NRC RAI Number: RAI-HCR-6

Provide details and results of identification efforts for historic properties of traditional religious and cultural importance (Traditional Cultural Properties and/or Traditional Cultural Landscapes) at PNP.

Enclosure 2, "*Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant*," did not provide reference to the identification or evaluation of historic properties of traditional religious and cultural importance (Traditional Cultural Properties or Traditional Cultural Landscapes) at PNP.

Identification of historic properties must take into account historic properties of traditional religious and cultural importance as part of 36 CFR 800.2(c)(2)(ii).

HDI Response to RAI:

Because the Restart project does not entail new ground disturbance outside of the previously developed areas of the existing facility, and the "*Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant*" of the 10 CFR 50.82 Exemption Request (ML23271A140) found no new or significant conditions that would change the conclusions of the 2006 SEIS on this topic, no further reviews beyond those described in the "*Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant*" were conducted.

As noted in the response to RAI-HCR-5, as part of the ongoing studies for the proposed new - Holtec SMR-300 units, stakeholder engagement outreach to the MSHPO, Native American Tribes and others are ongoing. In addition, the DOE has engaged with the MSHPO on their role in the Restart project.

Ongoing correspondence is occurring with regard to the other projects, including outreach to Native American Tribes. No written responses to the outreach letters have been received by Holtec as of September 25, 2024.

References:

None.

Associated Attachments:

None.

Enclosure 21
HDI PNP 2024-037

Enclosure 21

HDI PNP 2024-037

Response to Request for Additional Information –

RAI-HCR-8

**Regarding the Proposed Reauthorization of Power Operations of
Palisades Nuclear Plant Under
Renewed Facility Operating License No. DPR-20**

NRC RAI Number: RAI-HCR-8

Provide an updated, cultural history of the PNP area (including the Area of Potential Effects) since the 2006 LR EIS Supplement.

Enclosure 2, "Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant," did not provide an updated cultural history of PNP.

HDI Response to RAI:

No updated cultural history of the Palisades Nuclear Plant area was prepared as part of the New and Significant review. This was because the "*Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant*" of the 10 CFR 50.82 Exemption Request (ML23271A140) did not reveal any restart-related activities occurring outside the previously disturbed areas of the plant, nor any significant changes to recorded sites in the vicinity of the plant. Therefore, nothing that would change the conclusions of the 2006 SEIS was identified.

An updated cultural history was completed as part of the SMR-300 studies and was provided to MSHPO as part of the Archaeological Survey Report. The cultural history is available to the NRC through the MSHPO.

References:

None.

Associated Attachments:

None.

Enclosure 22
HDI PNP 2024-037

Enclosure 22
HDI PNP 2024-037
Response to Request for Additional Information –
RAI-RH-1
Regarding the Proposed Reauthorization of Power Operations of
Palisades Nuclear Plant Under
Renewed Facility Operating License No. DPR-20

NRC RAI Number: RAI-RH-1

Provide a description of the current radiological conditions (Baseline Affected Environment). Please include descriptions of known radiological hazards and workflow for mitigating identified unknown radiological hazards, a process for estimating dose in varied radiological conditions, an expected cumulative dose to workers during the refurbishment process, and a determination on if decommissioning-related activities have changed the potential emissions and exposure pathways for workers.

HDI Response to RAI:

Procedures have remained active during the decommissioning phase of plant operation to address known radiological hazards and workflow of mitigating identified unknown radiological hazards. These procedures provide a process for:

- estimating dose in varied radiological conditions;
- estimating an expected cumulative dose to workers during the restart project activities; and
- determining if decommissioning related activities have changed the potential emissions and exposure pathways for workers.

Procedures have been established to ensure compliance with requirements for 10 CFR 20 Subpart C. Specifically, the procedures

- establish a standard method for handling, controlling, storing, and accounting for radioactive material.
- establish guidelines for the Area Radiation Monitoring Program.
- document the dose levels in various areas of the site to ensure dose limits of unmonitored workers and members of the public are within federal limits.
- establishing requirements and polices for monitoring internal and external radiation exposure.
- provide instruction for production, use, revision, and close out of Radiological Work Permits.
- provide guidance for documenting radiological leaks or spills at Fleet Nuclear Facilities to ensure compliance with the decommissioning documentation requirements of USNRC regulations 10CFR50.75(g)(1) and 10CFR72.30(d)(1).

Additionally, radiological conditions have been evaluated to ensure these requirements are maintained. The 2022 Prospective Evaluation for Palisades Station is provided in Attachment 1.

References:

None.

Associated Attachments:

1. 2022 Prospective Evaluation for Palisades Station

Enclosure 22
Attachment 1
HDI PNP 2024-037

HDI PNP 2024-037

Enclosure 22

Attachment 1 - 2022 Prospective Evaluation for Palisades Station

21 pages follow





2022 Prospective Evaluation for Palisades Station

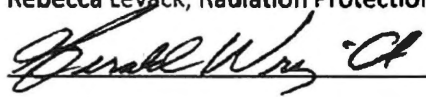
Date

08/09/2023

Report Number: PLP-RPT-23-001R0

Prepared by:  Date 8-21-23
Michael Ginzel, Health Physics Specialist

Reviewed by:  Date 8-22-23
Rebecca Levack, Radiation Protection Supervisor

Approved by:  Date 8-23-23
Gerald Wright, Radiation Protection Manager

Contents

| | | |
|-----|-----------------------------------------------------------------------------------------|----|
| 1.0 | Purpose..... | 3 |
| 2.0 | Scope | 3 |
| 3.0 | Regulatory and Guidance Document Review..... | 3 |
| 4.0 | Assumptions | 8 |
| 5.0 | Prospective Evaluation for Internal Dose Monitoring..... | 8 |
| 6.0 | Prospective Evaluation for Shallow Dose Equivalent – Whole Body Monitoring | 14 |
| 7.0 | Prospective Evaluation for Shallow Dose Equivalent – Maximum Extremity Monitoring | 14 |
| 8.0 | Documentation..... | 15 |
| 9.0 | Conclusions..... | 15 |

1.0 Purpose

This revised technical document describes the prospective evaluation for monitoring the occupational radiation exposure of personnel working at Palisades nuclear plant. The evaluation assessed historical exposures and work activities and updates the previous revision to predict the likelihood of future exposures for personnel. The primary goal of this evaluation was to determine the need to monitor personnel radiation exposures in accordance with 10CFR20.1502 and applicable NRC guidance.

2.0 Scope

This prospective evaluation includes:

1. Committed Effective Dose Equivalent (CEDE) and Committed Dose Equivalent (CDE) from internal dose hazards.
2. Shallow Dose Equivalent (SDE) for the skin of the whole body (or SDE-WB).
3. SDE to the skin of the maximum exposed extremity (or SDE-ME).

3.0 Regulatory and Guidance Document Review

10CFR20.1502 (attachment 1) states:

Each licensee shall monitor exposures to radiation and radioactive materials at levels sufficient to demonstrate compliance with the occupational dose limits.

§20.1502 requires licensees to monitor exposures to radiation of adults likely to exceed 10 percent of the occupational dose limits in 10CFR20.1201 (see Attachment 2), or annual limits on intakes in Appendix B to 10CFR20, "Annual Limits on Intake and Derived Air Concentrations of Radionuclides for Occupational Exposure".

§20.2106(a) (see attachment 3) states, in part, that each licensee shall maintain records of doses received by all individuals for whom monitoring was required pursuant to §20.1502.

NRC regulations do not explicitly provide a threshold for recording radiation exposure (i.e., when dose is assigned to an individual's permanent dose record, or NRC Form 5).

In other guidance documents, the NRC has stated that the 10 percent monitoring threshold is NOT an authorized recording threshold. In Task Interface Agreement (TIA) 2014-09, Recording and Reporting of Occupational Radiation Dose (issued February 12, 2016) [1], the NRC Office of Nuclear Reactor Regulation (NRR) staff provided clarification as to the existing regulatory requirements for recording and reporting internal and external dose.

Below is an excerpt from TIA 2014-09 pertaining use of dose reporting thresholds:

NRC licensees are required under 10CFR20.2106 to maintain records of all individual monitoring that is required by 10CFR20.1502. In addition, 10CFR20.2206 requires licensees to report the results of this required monitoring to the NRC REIRS project manager. However, NRC staff recognizes that licensees may supply individual monitoring for personnel in situations that are not actually required by 10CFR20.1502 (i.e., voluntary monitoring). Licensees may establish recording and reporting thresholds for the results of voluntary individual monitoring.

An example of voluntary monitoring might be if a licensee prospectively determines that monitoring is not required by 10CFR20.1502(a), for external, or 10CFR20.1502(b), for internal, exposures but provides monitoring to ensure that the actual exposures received verify the validity of its prospective determination. Regulatory Guide (RG) 8.34, "Monitoring Criteria and Methods to Calculate Occupational Radiation Doses," Section 1.4, and NUREG/CR-6204, "Questions and Answers Based on Revised 10 CFR Part 20," May 1994, questions 43 and 212, provide additional guidance on voluntary monitoring.

There are several considerations in determining whether individual monitoring provided by the licensee is required by 10CFR20.1502 or is voluntary. These include:

- Unless there is a documented prospective determination that individual monitoring was not required (i.e., planned exposure or intakes would not meet any of the criteria in 10CFR20.1502(a) or (b)), the fact that monitoring was provided is considered de facto evidence that the licensee had previously determined the monitoring was required by 10CFR20.1502.*
- If the prospective assessment determined that 10CFR20.1502 requires monitoring, recording and reporting of the monitoring results to the REIRS project manager are required under 10CFR20.2106 and 10CFR20.2206, respectively, even if the actual dose or intakes measured did not exceed the criteria in 10CFR20.1502(a) or (b).*
- If the results of the confirmatory (voluntary) dosimetry indicate the actual exposure exceeded any of the criteria in 10CFR20.1502(a) or (b), the monitoring was required monitoring, regardless of the licensee's original intent.*
- The first sentence in 10CFR20.1502 is: "Each licensee shall monitor exposures to radiation and radioactive materials at levels sufficient to demonstrate compliance with the occupational dose limits." Calculations of individual occupational dose performed to demonstrate compliance with the occupational dose limits in 10CFR20.1201 after an unmonitored, unintended, or uncontrolled exposure is also monitoring required under 10CFR20.1502, even if prospective determinations of likely doses from planned activities did not meet the criteria in 10CFR20.1502(a) or (b).*

According to TIA 2014-09, licensees can utilize a recording and reporting threshold provided that the exposure monitoring was performed to ensure that the actual exposures received verify the validity of its prospective determination. This would be contingent on the documentation of a prospective determination that exposures would not meet any of the criteria in 10CFR20.1502(a) or (b).

In the past, internal dose and skin dose assessments at Palisades have been performed in response to events involving unplanned, unintended incidents. By process, internal dose assessment initiating events were normally driven by the passive monitoring program (e.g., a personnel monitor alarm) and air sample program (e.g., positive air samples or continuous air monitor (CAM) alarms). Similarly, shallow dose equivalent assessments to the skin of the whole body were initiated by contamination events, most often from a discrete radioactive particle (DRP). This is different than the shallow dose equivalent to the maximum exposed extremity, where dose is measured by extremity dosimetry in almost all cases. At Palisades, DRP dose is calculated for SDE-WB and/or SDE-ME as appropriate. Attachment 4 provides additional information on NRC guidance for DRP dose.

Moreover, in TIA 2014-09, the NRC provided guidance on the precision with which the licensees should keep dose records (on NRC Form 4, Cumulative Occupational Dose History) and report occupational doses (on NRC Form 5). The NRC stated that the guidance in both Regulatory Guide 8.7, Instructions for Recording and Reporting Occupational Radiation Exposure Data [2], and in Regulatory Guide 8.34, Monitoring Criteria and Methods to Calculate Occupational Radiation Doses [3], indicate that the licensee need not enter doses less than 0.001 rem (1 mrem) on these forms. The NRC also stated in TIA 2014-09 that the NRC Region inspectors can use the clarifications and guidance in the TIA response as inspection program guidance. Therefore, the TIA applies generically to nuclear plant RP programs.

Some NRC questions and answers from NUREG/RC-6204 [4] are shown below:

- NUREG/CR-6204 Questions 43 [5]. In part (a), the licensee asked the following:

The licensee initially was required to monitor internal dose. The results indicate that monitoring is not required, i.e., levels are positive but less than 10% of the allowable limits. Can the measured internal dose values be ignored? If yes, will the licensee be in noncompliance if it sums internal and external doses?

In the answer to Question 43, the NRC stated the following:

"The licensee was required to monitor internal dose [because the licensee had made a prospective determination that the individual (s) was (were) "likely to receive" an intake in excess of 10% of the limits]. The internal dose values cannot be ignored regardless of the fact that they are less than 10% of the limits. If the licensee was not required to monitor internal dose because the licensee had made a prospective determination that the doses likely would be less than 10% of the limits but elected to monitor internal dose anyway, the licensee could choose to "ignore" the measured values that are less than 10% or to add those values to the external doses to obtain the sum of the internal and external doses. Nothing in Part 20 prohibits the licensee from monitoring or summing

internal doses at less than 10% of the limits; therefore, a licensee can never be in noncompliance for summing the internal and external doses”.

Palisade’s RP program rarely, if ever, allows personnel to work unprotected in areas of known internal exposure risks. Respiratory protection, engineering controls, and decontamination techniques are used to reduce the potential for internal dose, and to ensure personnel do not approach §20.1502(b) limits (i.e., an intake in excess of 10 percent of the applicable ALI(s) in table 1, Columns 1 and 2, of appendix B). As a result, Palisades has not calculated greater than 100 mrem CEDE (2% ALI) in the last 5 years. This is sufficient justification for a prospective evaluation that individual(s) working at Palisades are not "likely to receive" an intake in excess of 10% of the limits, and that internal dose monitoring at Palisades should be defined as voluntary.

- Review of NUREG/CR-6204 Questions 98 [6]. In Question 98, part (a), the licensee asked the following:

Since the nuclear power industry has had few intakes approaching the 10% criteria for adding internal and external doses, is the historical record of intakes plus the establishment of a corporate (licensee) policy to limit intakes to less than 10% of an ALI sufficient to exclude a nuclear power licensee from the requirements for "monitoring" intakes (10CFR20.1502) and adding internal and external (except for specific intake instances)?

The NRCs answer was as follows:

Yes, assuming that the conditions of exposure are not expected to change to the extent that they are outside the bounds of that historical record and that procedures will be put into effect to implement the policy. However, "surveys", in accordance with 10CFR20.1501 (a), would still be needed.

Like in evaluation of Question 43, the Palisades program has sufficient justification to exclude monitoring of intakes in accordance with 10CFR20.1502(b), so long as procedures are put into effect to implement a policy to limit intakes to less than 10 percent of an ALI (or sum of fractional ALIs). It is not expected that conditions of exposure will change based on long standing internal dose performance at Palisades. Air samples (surveys) and personnel monitoring investigations should continue to be implemented as defined in the current RP program.

- Review of TIA 2014-09 statement on demonstrating compliance with dose limits. TIA 2014-09 states the following:

Calculations of individual occupational dose performed to demonstrate compliance with the occupational dose limits in 10CFR20.1201 after an unmonitored, unintended, or uncontrolled exposure is also monitoring required under 10CFR20.1502, even if prospective determinations of likely doses from planned activities did not meet the criteria in 10CFR20.1502(a) or (b).

This excerpt of TIA 2014-09 prompts another question. What criteria are to be used by licensees to identify whether internal dose calculations were “performed to demonstrate compliance with the occupational dose limits in 10CFR20.1201?” In the NRC issued document Final Response to Task Interface Agreement 2014-09, Recording and Reporting of Occupational Radiation Dose (June 13, 2016) [7] the NRC stated three clarifying statements regarding this question. These were:

1. *A licensee may voluntarily monitor an individual in exposure situations where a documented prospective determination concluded monitoring is not required (see Regulatory Guide 8.34, C.1.4). The results of this voluntary monitoring (i.e., monitoring of individuals within the scope of this prospective determination) are not subject to the recording and reporting requirements (unless the monitoring results indicates the prospective determination was faulty or the criteria in 20.1502 was exceeded).*
2. *If the licensee did not document a prospective determination for a monitored exposure situation (or if the exposure was outside the scope of the associated prospective determination), it must be assumed that the monitoring was required (i.e., necessary to demonstrate compliance with Part 20).*
3. *The fact that the monitoring was the result of a dose calculation does not in itself make it required monitoring. It could still be voluntary monitoring that verified the assumptions of the applicable prospective determination (e.g., calculated internal dose calculations may verify that radioactive intakes from routine exposures, and small unplanned intakes, are within the values predicted by the prospective determination that concluded that monitoring was not required).*

Finally, revision 4 of NRC Regulatory Guide 8.7, Revision 4 [8] states that:

If the prospective dose evaluation shows that an individual is not likely to receive a dose in a year that exceeds the monitoring criteria set forth in 10CFR20.1502, the licensee is not required to monitor the individual’s dose, to keep records or report the individual’s dose. If monitoring of the occupational intake of radioactive material and assessment of the CEDE is not being performed, then licensee evaluations of subsequent minor intakes that were anticipated based on the prospective dose evaluation or pre-job evaluations is not required monitoring.

Additionally,

10CFR20.2206(b) requires certain categories of licensees to annually report their 10CFR20.1502 monitoring results, using NRC form 5 to the Radiation Exposure Information and Reporting Systems (REIRS) regardless of the actual dose received (even if the actual dose received is less than the dose criteria for which monitoring is required).

Therefore, if a documented prospective evaluation concluded that monitoring was not required for an exposure situation (e.g., work activities where intakes may occur from routine exposures and small unplanned intakes), and the voluntary monitoring method utilized (e.g., an internal dose assessment calculation) verified the assumptions of the prospective evaluation (i.e., that an adult individual would not likely receive 10 percent of the applicable ALI(s) in table 1, Columns 1 and 2, of Appendix B to §§20.1001-20.2402), then it is clear that the internal dose assessment calculation was not performed to

demonstrate compliance with the occupational dose limits in 10CFR20.1201. In this scenario, the internal dose calculations would not be considered monitoring required under 10CFR20.1502, and would remain voluntary monitoring.

4.0 Assumptions

Similar Job Functions are plant work activities bounded by the same maximum radiological personnel exposure risk potential. For the purpose of this document, the work activities performed during online, outage and decommissioning activities at Palisades nuclear plant during 2022 and previously evaluated years are considered similar job functions, in that future personnel exposures for plant work activities that are similar to the activities have the same maximum personnel exposure risk as the personnel performing similar work activities that were performed in 2022 and previously evaluated years. For example, future work by craft valve technicians or plant operators will result in the same radiological risk as those performing those work activities during 2022 and previously evaluated years.

Unanticipated Exposure is an internal exposure or external SDE exposure that is dissimilar to the type of extent of Palisades nuclear plant exposures from 2022 and previously evaluated years. Specifically, for internal dose, an unanticipated exposure would result in greater than or equal to 100 mrem CEDE or be due to an unusual exposure event (such as absorption through the skin). Stated differently, it is unlikely that a Palisades nuclear plant worker performing similar job functions as the workers during the period 2022 and previously evaluated years would receive greater than or equal to 100 mrem CEDE from inhalation or ingestion of radioactive material. For SDE exposure, an unanticipated exposure would result in a worker receiving greater than or equal to 1000 mrem, i.e. it is unlikely that a Palisades nuclear plant worker would receive greater than or equal to 1000 mrem SDE in a year while performing similar job functions as the workers during the period 2022 and previously evaluated years.

5.0 Prospective Evaluation for Internal Dose Monitoring

As allowed by NRC guidance, voluntary monitoring (and internal dose assessments) may be provided to ensure that the actual exposures received verify the validity of a prospective evaluation that the individual(s) working are not "likely to receive" an intake in excess of 10% of the limits.

Respiratory protection, engineering controls, and decontamination techniques are used to reduce the potential for internal dose. Since 2008, there were 0 instances where internal dose was greater than or equal to 10 mrem CEDE. Attachment 5 contains a summary of the 2022 internal dose information. Previous years were documented under site specific prospectus evaluations, TID 2016-004 and 2018-008.

Based on the historical data, and barring a significant change in radionuclide composition (e.g. caused by a significant fuel failure that greatly increased the potential for significant internal dose), the work

activities at Palisades nuclear plant (online, outage and decommissioning activities) performed under the controls provided by the current RP program would not likely result in plant radiation workers performing similar job functions receiving, in 1 year, an intake in excess of 10 percent of the applicable ALI(s) in table 1, Columns 1 and 2, of Appendix B to §§20.1001-20.2402. Additionally, internal dose assessments are also not required to demonstrate compliance with 10CFR20.1201 dose limits, but will be performed to ensure that the actual exposures received verify the validity of this prospective evaluation.

Some common sense principles should be used to further ensure internal dose monitoring is validated to be voluntary:

- a. Use of a Recording Level of 10 mrem CEDE for documenting internal dose (0.2 percent of an ALI).
- b. Verify that no substantial change in radionuclide composition exists, such that the conditions of exposure are not expected to change to the extent that they are outside the bounds of that historical record. For example, a substantial fuel defect may alter the radionuclide composition that could result in a significant shift in alpha intake risks.
- c. A validation of the internal dose prospective evaluation should be performed when evaluating the site alpha characterization.

2022 was a typical year with regard to internal exposure to workers from airborne radioactivity areas at Palisades Station. The airborne radioactivity areas at Palisades Station are characteristically transient in nature. Therefore, there were limited instances in 2022 where workers were actually exposed to airborne radioactivity.

It was determined that the highest beta/gamma DAC value a worker was exposed to in 2022 was 9.96E-4 DAC (3-2022-05-21-001) and the highest iodine value was 2.34E-4 DAC (PLP-AS-052322-0233). The highest alpha value was 0.146 DAC (2022-AS-0152) and the highest tritium value was 0.12 DAC (PLP-AS-042622-0175).

Even though these samples were from different areas, if they were combined (conservatively), the combined particulate, iodine, and alpha DAC value of 0.27 DAC will be used.

For this report, air samples taken between January 1, 2022, and December 31, 2022 noted above were summed to provide a conservative DAC value of 0.27 DAC. The time period will be a 12-hour shift. These values are recorded in Table 1.

Table 1: Maximum Potential Internal Exposure Based on Air Sample Data from 2022

| Type | Date | Location | Exposure time (hrs) | Air Sample DAC | DAC hours |
|-------------------|------------|-----------|---------------------|----------------|--------------|
| Particulate Gamma | 5/20/2022 | 590 CTMT | 12.00 | 9.96E-4 | 1.19E-2 |
| Particulate Alpha | 12/14/2022 | Cavity | 12.00 | 0.146 | 1.75 |
| Tritium | 04/27/2022 | CTMT 590' | 12.00 | 0.12 | 1.44 |
| Iodine | 05/23/2022 | 590 CTMT | 12.00 | 2.34E-4 | 2.80E-3 |
| | | | Total | - | 3.20 |
| | | | % ALI | - | 0.16% |

$$\{(3.20 \text{ DAC-hours} * 2.5 \text{ mrem/DAC-hour}) \div 5000 \text{ mrem/ALI} * 100 = 0.16\}$$

¹ 10 mrem CEDE is the recording level recommended by ANSI/HPS N13.39-2001/2011, Design of Internal Dosimetry Programs

To calculate the percent ALI, the total DAC-hour value for the time period given was divided by 2000 DAC-hours (1 ALI = 2000 DAC-hours) to determine the percent ALI to which a worker was exposed. The largest potential internal exposure from airborne radiation for 2022 was conservatively determined to be 0.16% ALI. This is using duration of 12 hours. Based on this part of the evaluation, it is not likely that a worker at Palisades Station would receive an intake in excess of 10% of an ALI.

Difficult-to-Measure Radionuclide Evaluation

The whole-body counter only measures those radionuclides that are gamma emitters and cannot detect radionuclides that decay by gamma rays less than approximately 120 keV or other decay modes, such as pure beta or pure alpha emissions. In this report, difficult-to-measure radionuclides were accounted for by utilizing the Palisades Station 10CFR61 scaling factors for Dry Active Waste (DAW).

Palisades had established a procedure EN-RP-314, Passive Monitor Sensitivity Testing, to ensure detection sensitivity of onsite Whole-Body Contamination Monitors (WBCM) used to detect gamma emitting radionuclides. This procedure calculates the fractional ALIs from the gamma emitting isotopes identified in the 10 CFR part 61 analyses for difficult to detect nuclides. The current documented evaluations are listed in PLP-RPT-19-010R1 PASSIVE MONITOR SENSITIVITY TESTS Performed on Canberra ARGOS and GEM-5 WBCMs.

Site 10CFR61 contamination trending analyses are controlled by EN-RW-104, Scaling Factors. This procedure has performance constraints that will initiate a reevaluation of site contamination exposure monitoring characteristics established if there is a change in trended values. Additionally, the previous Fleet established a failed fuel procedure EN-RP-142, Failed Fuel Response. This procedure required reevaluation of source term contamination assumptions when the site experiences an INPO level 1/2 event as defined in EN-NF-102, Corporate Fuel Reliability. This is intended to adjust instrument and internal/external dose calculation variables when failed fuel exists which can change the trended contamination radiological compositions. Palisades' fuel performance has remained stable for the last operating cycle.

The purposes for these procedural controls are to ensure workers' internal exposure controls and established assumptions are appropriate for plant conditions. There are procedural action requirements to initiate re-evaluations of established equipment parameters to ensure accuracy of internal/external exposure monitoring based on changes to plant contamination characteristic changes. These controls assure that the difficult to detect (DTD) nuclides are properly assessed for exposure monitoring purposes.

Average Beta Contamination Characterization

Health Physics Position Paper HPPOS-250 PDR-920626127, Monitoring at Nuclear Power Plants for Contamination by Radionuclides that Decay by Electron Capture, identifies the typical controls for monitoring for the release of radioactive material. Current practices established at the site are in line with this position paper.

The Station incorporates the use of Tool Equipment Monitors (TEM) to augment the detection of difficult to detect isotopes. Station procedures require the authorization by RP Management for the release of items other than through the TEM. This allows for an independent evaluation for the potential contamination present based on the equipment's use and systems the item to be released has been utilized on.

EN-RP-201, Dosimetry Administration Section 5.8 [2] states:

Periodically, based upon the frequency established for the site 10 CFR 61 analyses, RP personnel documents a review of plant average beta energy. The documented review may be in the form of a memo for record.

This evaluation has been established to validate the assumptions established in previous evaluations.

Fleet procedure EN-RW-104, Scaling Factors, has controls that monitor the station's source term for radioactive waste characterization/disposal purposes in accordance with 10 CFR Part 61. The trending components monitor various contaminant concentration ratios to identify changes in fuel performance (source term). This procedure has logic built into the analysis that will initiate additional action if the radioactive contamination mix significantly changes from one operating cycle to the next.

Smears were taken in various areas within the Radiologically Controlled Area (RCA). The smears were counted using a mini-scaler and analyzed using a high purity germanium detector with a multi-channel analyzer. The samples analyzed were tabulated in Table 2, Isotopic Analysis of Smears.

Table 2: Beta Smear Location Trending Isotopic Analysis of Smears

| Location | Gamma Spec Results # |
|--------------------------|----------------------|
| NSSS | 3-2023-07-27-007 |
| Aux Sump Floor | 3-2023-07-27-008 |
| Aux 590 floor drain | 3-2023-07-27-009 |
| Chem/Laundry | 3-2023-07-27-010 |
| Aux 570 EESG Sump Floor | 3-2023-07-27-011 |
| Aux 570 WESG | 3-2023-07-27-012 |
| Aux 625 ALPS Sample Sink | 3-2023-07-27-013 |

After the smears were counted and the isotopes identified, the average beta energies were determined and summarized in table 3 using the following equation:

$$E = \frac{\sum E_i Y_i Q_i}{\sum Y_i Q_i}$$

Where:

- E = Mean average energy of emitted betas
- Q_i = The nuclide's activity or fraction present
- E_i = The nuclide's average beta energy
- Y_i = The yield for the energy

The presence of very low energy beta radiation (which may not cause a detector response or penetrate to 7 mg/cm² skin depth) may unjustifiably lower the average energy determined. Therefore, for this study, average beta energies less than 0.01 MeV (10 keV) were disregarded in the calculation.

Table 3: 2023 Average Beta Energy Update

| 2023 | E _i | Y _i | Q _i | E _i Y _i Q _i | Y _i Q _i |
|---------|----------------|----------------|----------------|----------------------------------------------|-------------------------------|
| Nuclide | Avg Beta KeV | Yield | Mix Amount | | |
| Co-60 | 95.7 | 1 | 3.87E-02 | 3.70E+00 | 3.87E-02 |
| Cs-137 | 156.8 | 0.946 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cs-137 | 415.2 | 0.054 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Co-58 | 201.2 | 0.149 | 7.12E-07 | 2.13E-05 | 1.06E-07 |
| Nb-95 | 43.4 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Ag-110m | 21.8 | 0.673 | 2.58E-03 | 3.79E-02 | 1.74E-03 |
| Ag-110m | 165.6 | 0.3 | 2.58E-03 | 1.28E-01 | 7.74E-04 |
| Sb-125 | 24.9 | 0.136 | 4.48E-04 | 1.52E-03 | 6.09E-05 |
| Sb-125 | 34.8 | 0.181 | 4.48E-04 | 2.82E-03 | 8.11E-05 |
| Sb-125 | 87 | 0.399 | 4.48E-04 | 1.56E-02 | 1.79E-04 |
| Sb-125 | 215.5 | 0.135 | 4.48E-04 | 1.30E-02 | 6.05E-05 |
| Zr-95 | 109.3 | 0.554 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Zr-95 | 120.4 | 0.437 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Zr-95 | 327 | 0.0078 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Zr-95 | 405.4 | 0.001 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Nb-97 | 983 | 0.469 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Nb-97 | 10.8 | 0.314 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| La-140 | 487.4 | 0.445 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | | Column | Sum | 3.90E00 | 4.16E-02 |

| | |
|--------------------|----------|
| $\sum E_i Y_i Q_i$ | 3.90E+00 |
| $\sum Y_i Q_i$ | 4.16E-02 |

| | |
|------------------|-----------|
| E _{avg} | 9.383E+01 |
|------------------|-----------|

Evaluation of Declared Pregnant Workers (DPWs) and Minors

Under 10CFR20, DPWs are defined as workers who have voluntarily informed their employer, in writing, of their pregnancy and the estimated date of conception. A minor, defined in 10CFR20, is any individual

under 18 years of age. DPWs and minors as stated in 10CFR20 have an annual occupational dose limit of 0.5 rem. 10CFR20.1502 states that the licensee (Palisades Station) shall monitor occupational dose for DPWs and minors if it is likely that they are to receive an occupational dose in excess of 0.1 rem. Since there were no actual intakes for 2022 at Palisades Station of this magnitude, Palisades Station is not required to monitor DPWs and minors for internal dose.

EN-RP-201, Revision 5, Dosimetry Administration, Section 5.3 [3] states that Minors are not allowed access to the RCA, therefore, no internal exposure monitoring is required. Section 5.3 [3] also states that Members of the General Public are limited to 50 mrem Total Effective Dose Equivalent (TEDE), which includes the CEDE portion and Effective Dose Equivalent (EDE) portion. Section 5.3 [3] further states that DPWs are limited to 50 mrem TEDE in any one month not to exceed 400 mrem TEDE for the gestation period. DPWs and Members of the General Public are not permitted in contaminated or airborne areas, further reducing the likelihood of internal exposure. Based on this information, it is determined that DPWs and Members of the General Public are not required to be monitored for internal exposure.

6.0 Prospective Evaluation for Shallow Dose Equivalent – Whole Body Monitoring

Based on review of exposure data from 2015 to 2022, considering the work activities performed at Palisades nuclear plant (online, outage and decommissioning activities), and the radiological controls provided by the current RP program, it is unlikely that plant radiation workers would receive, in one year, SDE-WB in excess of 10 percent of the 50,000 mrem limit. Therefore, SDE-WB is not required monitoring as specified in 10CFR20.1502. A summary of the applicable 2022 SDE-WB data is below (also see Attachment 5):

1. The maximum 2022 SDE-WB for a single individual was 0.842 rem.
2. The maximum collective SDE-WB for a single individual for the 2015-2022 (8 years period) was 3.028 rem.
3. The average 2022 SDE-WB of individuals with positive DLR dose reported was 0.127 rem (this average excludes individuals with no reported dose).
4. The median 2022 SDE-WB of individuals with positive DLR dose reported was 0.042 rem.
5. 11,274 records of individuals being issued during the 8-year period (i.e., number of whole-body DLRs issued).

7.0 Prospective Evaluation for Shallow Dose Equivalent – Maximum Extremity Monitoring

Based on review of exposure data from 2015 to 2022 (11,274 individuals monitored), considering the work activities performed at Palisades nuclear plant (online, outage and decommissioning activities),

and the radiological controls are provided by the current RP program, it is unlikely that plant radiation workers would receive, in one year, SDE-ME in excess of 10 percent of the 50,000 mrem limit. Therefore, SDE-ME is not required monitoring as specified in 10CFR20.1502. A summary of the applicable SDE-ME data is below (also see Attachment 5). The previous report was submitted as PLP-RPT-21-002 R0.

1. The maximum 2022 SDE-ME for a single individual was 1.052 rem.
2. The maximum collective SDE-ME for a single individual for the 2015-2022 (8 years period) was 2.771 rem.
3. The average 2022 SDE-ME of individuals with positive TLD dose reported was 0.141 rem (this average excludes individuals with no reported dose).
4. The median 2022 SDE-ME of individuals with positive TLD dose reported was 0.041 rem.

8.0 Documentation

The final issue considered was the potential gains achieved by voluntarily documenting dose assessments at thresholds less than 10 percent of NRC dose limits. These “soft” benefits, although not quantifiable, should not be underestimated. The following are just some of the potential benefits identified:

- It provides documentation of the internal dose assessment for future use by NRC inspectors, INPO, and other industry stakeholders (such as ANI).
- The documentation could be used in future use in litigation if encountered.
- Increased confidence (in RP), and the perception by the individual(s) involved and industry stakeholders of program rigor and comprehensiveness.
- Documented validation of the exposure monitoring processes, including the passive monitor program are bounding the prospective evaluation.

Also, because dose assessments are similar to radiological surveys; if a dose assessment was not documented in some manner, then there would be no objective evidence (or record) that an assessment was performed. Therefore results should be documented as long as the level of documentation and effort required to document the dose is reasonable. However the fact that a dose calculation is documented does not in itself imply that monitoring was required.

9.0 Conclusions

This prospective evaluation determined that individuals working (or visitors) at Palisades nuclear plant, that perform similar job functions and activities, are not likely to receive more than 10% of the following dose limits:

1. SDE-WB (50 rem).

2. SDE-ME (50 rem).
3. CEDE (5 rem).
4. CDE (50 rem).

The evaluation considered the maximum internal and external exposures from previous monitoring in the years 2022 and previous evaluations to determine future likely exposures. This prospective evaluation determined that personnel monitoring for SDE-WB, SDE-ME, CEDE, and CDE are not 10CFR20.1502 required monitoring, and is considered voluntary. As a result, this voluntary monitoring of personnel is not subject to the dose recording requirements of 10CFR20.2106.

In addition, any exposure not encompassed by this prospective evaluation (i.e., an unanticipated exposure outside the scope of this prospective evaluation) is assumed to be monitoring required by 10CFR20.1502 to demonstrate compliance with Part 20. In these situations, recording of exposures 10CFR50.2106 and 10CFR20.2206 require reactor licensees to make records of, and annually report to the NRC, the results of individual monitoring required by 10CFR20.1502, respectively.

REFERENCES

1. Final Response to Task Interface Agreement 2014-09, Recording and Reporting of Occupational Reporting of Occupational Radiation Dose, February 12, 2016 (ML15187A388)
2. Regulatory Guide 8.7, Instructions for Recording and Reporting Occupational Radiation Dose Data, Revision 2, February 2005
3. Regulatory Guide 8.34, Monitoring Criteria and Methods to Calculate Occupational Radiation Doses, Revision 4, May 2018
4. NUREG/CR-6204, Questions and Answers Based on Revised 10CFR Part 20, May 1994
5. Question 43 of NUREG/CR-6204, Questions and Answers Base on Revised 10CFR20
6. Question 98 of NUREG/CR-6204, Questions and Answers Base on Revised 10CFR20
7. Final Response to Task Interface Agreement 2014-09, Recording and Reporting of Occupational Reporting of Occupational Radiation Dose (ML15187A388), June 13, 2016 (ML16137A098)
8. Regulatory Guide 8.7, Instructions for Recording and Reporting Occupational Radiation Dose Data, Revisions 4, May 2018

ATTACHMENT 1**§20.1502 Conditions Requiring Individual Monitoring of External and Internal Occupational Dose**

Each licensee shall monitor exposures to radiation and radioactive material at levels sufficient to demonstrate compliance with the occupational dose limits of this part. As a minimum—

- (a) Each licensee shall monitor occupational exposure to radiation from licensed and unlicensed radiation sources under the control of the licensee and shall supply and require the use of individual monitoring devices by—
- (1) Adults likely to receive, in 1 year from sources external to the body, a dose in excess of 10 percent of the limits in §20.1201(a),
 - (2) Minors likely to receive, in 1 year, from radiation sources external to the body, a deep dose equivalent in excess of 0.1 rem (1 mSv), a lens dose equivalent in excess of 0.15 rem (1.5 mSv), or a shallow dose equivalent to the skin or to the extremities in excess of 0.5 rem (5 mSv);
 - (3) Declared pregnant women likely to receive during the entire pregnancy, from radiation sources external to the body, a deep dose equivalent in excess of 0.1 rem (1 mSv);² and
 - (4) Individuals entering a high or very high radiation area.
- (b) Each licensee shall monitor (see §20.1204) the occupational intake of radioactive material by and assess the committed effective dose equivalent to—
- (1) Adults likely to receive, in 1 year, an intake in excess of 10 percent of the applicable ALI(s) in table 1, Columns 1 and 2, of appendix B to §§20.1001-20.2402;
 - (2) Minors likely to receive, in 1 year, a committed effective dose equivalent in excess of 0.1 rem (1 mSv); and
 - (3) Declared pregnant women likely to receive, during the entire pregnancy, a committed effective dose equivalent in excess of 0.1 rem (1 mSv).

² All of the occupational doses in §20.1201 continue to be applicable to the declared pregnant worker as long as the embryo/fetus dose limit is not exceeded.

ATTACHMENT 2**§20.1201 Occupational Dose Limits for Adults**

- (b) The licensee shall control the occupational dose to individual adults, except for planned special exposures under §20.1206, to the following dose limits.
- (1) An annual limit, which is the more limiting of--
 - (i) The total effective dose equivalent being equal to 5 rems (0.05 Sv); or
 - (ii) The sum of the deep-dose equivalent and the committed dose equivalent to any individual organ or tissue other than the lens of the eye being equal to 50 rems (0.5 Sv).
 - (2) The annual limits to the lens of the eye, to the skin of the whole body, and to the skin of the extremities, which are:
 - (i) A lens dose equivalent of 15 rems (0.15 Sv), and
 - (ii) A shallow-dose equivalent of 50 rem (0.5 Sv) to the skin of the whole body or to the skin of any extremity.
- (c) Doses received in excess of the annual limits, including doses received during accidents, emergencies, and planned special exposures, must be subtracted from the limits for planned special exposures that the individual may receive during the current year (see §20.1206(e)(1)) and during the individual's lifetime (see §20.1206(e)(2)).
- (d) When the external exposure is determined by measurement with an external personal monitoring device, the deep-dose equivalent must be used in place of the effective dose equivalent, unless the effective dose equivalent is determined by a dosimetry method approved by the NRC. The assigned deep-dose equivalent must be for the part of the body receiving the highest exposure. The assigned shallow-dose equivalent must be the dose averaged over the contiguous 10 square centimeters of skin receiving the highest exposure. The deep-dose equivalent, lens-dose equivalent, and shallow-dose equivalent may be assessed from surveys or other radiation measurements for the purpose of demonstrating compliance with the occupational dose limits, if the individual monitoring device was not in the region of highest potential exposure, or the results of individual monitoring are unavailable.
- (e) Derived air concentration (DAC) and annual limit on intake (ALI) values are presented in table 1 of appendix B to part 20 and may be used to determine the individual's dose (see §20.2106) and to demonstrate compliance with the occupational dose limits.
- (f) In addition to the annual dose limits, the licensee shall limit the soluble uranium intake by an individual to 10 milligrams in a week in consideration of chemical toxicity (see footnote 3 of appendix B to part 20).
- (g) The licensee shall reduce the dose that an individual may be allowed to receive in the current year by the amount of occupational dose received while employed by any other person (see §20.2104(e)).

ATTACHMENT 3**§20.2106 Records of Individual Monitoring Results**

- (a) Recordkeeping requirement. Each licensee shall maintain records of doses received by all individuals for whom monitoring was required pursuant to §20.1502, and records of doses received during planned special exposures, accidents, and emergency conditions. These records⁵ must include, when applicable—
- (1) The deep-dose equivalent to the whole body, lens dose equivalent, shallow-dose equivalent to the skin, and shallow-dose equivalent to the extremities;
 - (2) The estimated intake of radionuclides (see §20.1202);
 - (3) The committed effective dose equivalent assigned to the intake of radionuclides;
 - (4) The specific information used to assess the committed effective dose equivalent pursuant to §20.1204(a) and (c), and when required by §20.1502;
 - (5) The total effective dose equivalent when required by §20.1202; and
 - (6) The total of the deep-dose equivalent and the committed dose to the organ receiving the highest total dose.
- (b) Recordkeeping frequency. The licensee shall make entries of the records specified in paragraph (a) of this section at least annually.
- (c) Recordkeeping format. The licensee shall maintain the records specified in paragraph (a) of this section on NRC Form 5, in accordance with the instructions for NRC Form 5, or in clear and legible records containing all the information required by NRC Form 5.
- (d) Privacy protection. The records required under this section should be protected from public disclosure because of their personal privacy nature. These records are protected by most State privacy laws and, when transferred to the NRC, are protected by the Privacy Act of 1974, Public Law 93-579, 5 U.S.C. 552a, and the Commission's regulations in 10 CFR part 9.
- (e) The licensee shall maintain the records of dose to an embryo/fetus with the records of dose to the declared pregnant woman. The declaration of pregnancy shall also be kept on file, but may be maintained separately from the dose records.
- (f) The licensee shall retain the required form or record until the Commission terminates each pertinent license requiring this record. This includes records required under the standards for protection against radiation in effect prior to January 1, 1994.

ATTACHMENT 4**Health Physics Questions and Answers - Question 402****Question 402:**

NRC Form 5 (Item No. 21, "Comments") implies that dose from a "hot particle" should be added to the shallow dose equivalent, maximum extremity (SDE, ME - Block 14). However, I&E Notice 90-48 states that "hot particle exposure will not be added to skin doses from sources other than hot particles."

- (h) Should hot particle doses be added to the shallow dose equivalent as implied?
- (i) If so, should this dose be subtracted from the applicable dose category with regard to remaining available shallow dose equivalent (skin or extremity) for the year? Based on our understanding of the intent of IE Notice 90-48, we believe that "hot particle" doses should not be subtracted from the remaining available shallow dose equivalent (skin or extremity) for the year.

Answer:

The intent of the "hot particle" example in the instructions for Item 21 on Form 5 is simply to give one an example of how this space on the form might be used. There is no intention to imply that hot particle doses should be added to other doses. The question of adding hot particle skin poses to other skin doses was addressed in IE Information Notice 90-48, "Enforcement policy for Hot Particle Exposures," and the enforcement policy enclosed with that notice, and in Health Physics Position (HPPOS) 246 (in NUREG / CR-5569). The NRC policy and staff positions in these documents have not been changed by revised Part 20 or the instructions for Form 5 in Regulatory Guide. Answers to the specific questions are as follows:

- (a) As indicated in HPPOS-246, licensees may choose whether or not to add a hot particle dose to other skin or extremity doses. However, in either case, the record should be clear as to the amount of the hot particle dose. In determining whether or not an overexposure has occurred, the NRC will consider the hot particle dose alone, without adding it to other doses.
- (b) The hot particle dose should not be subtracted from the remaining available shallow dose equivalent (skin or extremity) for the year.

ATTACHMENT 5

Summary of Dose 2022 and previous evaluated periods

| <u>YEAR</u> | | <u>NUMBER MONITORED</u> | <u>DDE</u> <u>(Rem)</u> | <u>LDE</u> <u>(Rem)</u> | <u>SDE-WB</u> <u>(Rem)</u> | <u>SDE-ME</u> <u>(Rem)</u> | <u>CEDE</u> <u>(Rem)</u> | <u>CDE</u> <u>(Rem)</u> | <u>TEDE</u> <u>(Rem)</u> |
|-----------------------------------------------------------------------------------------------------------------------------------------|------------|-------------------------|----------------------------|----------------------------|-------------------------------|-------------------------------|-----------------------------|----------------------------|-----------------------------|
| <p>Note: Previous years documented on site specific technical documents, PLP-RPT-19-008 R0, PLP-RPT-19-002 R1 and PLP-RPT-21-002R0.</p> | | | | | | | | | |
| <u>2018</u> | | <u>2,161</u> | | | | | | | |
| | <u>AVG</u> | | <u>0.088</u> | <u>0.088</u> | <u>0.226</u> | <u>0.249</u> | <u>NR</u> | <u>NR</u> | <u>0.088</u> |
| | <u>MAX</u> | | <u>1.430</u> | <u>1.430</u> | <u>1.722</u> | <u>1.949</u> | <u>NR</u> | <u>NR</u> | <u>1.722</u> |
| | | | | | | | | | |
| <u>2019</u> | | <u>916</u> | | | | | | | |
| | <u>AVG</u> | | <u>0.062</u> | <u>0.062</u> | <u>0.062</u> | <u>0.062</u> | <u>NR</u> | <u>NR</u> | <u>0.062</u> |
| | <u>MAX</u> | | <u>0.472</u> | <u>0.459</u> | <u>0.494</u> | <u>0.494</u> | <u>NR</u> | <u>NR</u> | <u>0.472</u> |
| | | | | | | | | | |
| <u>2020</u> | | <u>1756</u> | | | | | | | |
| | <u>AVG</u> | | <u>0.280</u> | <u>0.271</u> | <u>0.280</u> | <u>0.305</u> | <u>NR</u> | <u>NR</u> | <u>0.280</u> |
| | <u>MAX</u> | | <u>1.872</u> | <u>1.697</u> | <u>1.856</u> | <u>2.771</u> | <u>NR</u> | <u>NR</u> | <u>1.872</u> |
| | | | | | | | | | |
| <u>2021</u> | | <u>793</u> | | | | | | | |
| | <u>AVG</u> | | <u>0.044</u> | <u>0.041</u> | <u>0.044</u> | <u>0.44</u> | <u>NR</u> | <u>NR</u> | <u>0.042</u> |
| | <u>MAX</u> | | <u>0.360</u> | <u>0.315</u> | <u>.350</u> | <u>0.350</u> | <u>NR</u> | <u>NR</u> | <u>0.315</u> |
| | | | | | | | | | |
| <u>2022</u> | | <u>903</u> | | | | | | | |
| | <u>AVG</u> | | <u>0.127</u> | <u>0.128</u> | <u>0.127</u> | <u>0.141</u> | <u>NR</u> | <u>NR</u> | <u>0.128</u> |
| | <u>MAX</u> | | <u>0.842</u> | <u>0.842</u> | <u>0.842</u> | <u>1.052</u> | <u>NR</u> | <u>NR</u> | <u>0.842</u> |
| | | | | | | | | | |

Enclosure 23
HDI PNP 2024-037

Enclosure 23

HDI PNP 2024-037

Response to Request for Additional Information –

RAI-WM-1

**Regarding the Proposed Reauthorization of Power Operations of
Palisades Nuclear Plant Under
Renewed Facility Operating License No. DPR-20**

NRC RAI Number: RAI-WM-1

To adequately characterize the baseline affected environment, describe the current waste management strategy, including disposal plans, and quantity of wastes (radioactive, non-radioactive, and mixed). Also describe expected waste to be generated at PNP during restart-related activities and operation.

Enclosure 2, "*Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant*", did not provided a description of the expected wastes generated to make a determination of the waste management impacts related to the proposed actions. For example, it is expected that HDI will be performing chemical cleaning of various reactor systems during restart-related activities, such as the primary system loops and reactor vessel. Such activities, including refurbishment activities, may generate mixed wastes in greater quantities than during prior operational years.

HDI Response to RAI:

As stated in Section 2.1.1 of the *Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant*, of the 10 CFR 50.82 Exemption Request (ML23271A140), "PNP's liquid, gaseous, and solid radioactive waste management systems have not undergone major changes since the SEIS was issued." Radiological and nonradiological waste management is also discussed in Sections 3.10 and 4.10 of the *Environmental New and Significant Review*. Holtec has plans and procedures for management of its waste types, including a hazardous waste management plan, an asbestos abatement/man-made mineral fiber removal plan, solid radioactive waste process control program for documenting the methods used for processing, classification and packaging low level wet radioactive waste into a form acceptable for interim on-site storage, shipping and disposal, and the current disposal site criteria. Holtec also has a radioactive material control procedure for handling, controlling, storing, and maintaining accountability of radioactive material and a radioactive shipping procedure for shipping radioactive material or waste.

As for expected waste to be generated during restart activities, waste types would be those generated during operations (radwaste, hazardous waste, construction debris, scrap metal, universal waste, nonhazardous solid waste). The existing waste management processes would be used for the waste from restart activities. Liquid waste discharges would be subject to the current NPDES permit.

Approximately 12,000 cubic feet of class "A" waste has been created between PNP shutdown in May 2022 and July 2024. The past several years of waste generated and shipped (which is also reported publicly via the Annual Radiological Effluent Release Reports) were reviewed for this evaluation rather than attempting to qualify exact volumes and types of waste generated for each individual project due to the complexities associated with routine decontamination, maintenance, and replacement of components which will occur during the restart project.

From this evaluation, and assuming three times the volume of a typical PNP refueling outage, the following waste is estimated to be generated during the restart project: 30,000 cubic feet of class "A" dry active waste, 200 cubic feet of class "C" filters, 1,600 cubic feet of class "A" resin,

and 240 cubic feet of class "B" resin. Any significant deviations from the estimated volume of radiological waste generated is expected to be relatively low in activity (Class A).

An additional 120 cubic feet of class "A" resin, 570 cubic feet of class "C" resin, and 1000 cubic feet of class "C" irradiated components is estimated to be generated from the primary coolant system decontamination project and the reactor head nozzle replacement (performed as part of the restart project).

Given that restart activities would not be as extensive as decommissioning activities, the low-level radioactive waste volume from restart activities would be less than for decommissioning activities in Table 3-6 of the PNP Post Shutdown Decommissioning Activities Report (PSDAR) (ML20358A232), which presents an estimate of 1,129,800 cubic feet of low-level radioactive waste. The PSDAR concluded that impacts from decommissioning waste would be bounded by NRC's decommissioning GEIS, NUREG-0586, which determined impacts would be small.

References:

None.

Associated Attachments:

None.

Enclosure 24
HDI PNP 2024-037

Enclosure 24
HDI PNP 2024-037
Response to Request for Additional Information –
RAI-FC-1
Regarding the Proposed Reauthorization of Power Operations of
Palisades Nuclear Plant Under
Renewed Facility Operating License No. DPR-20

NRC RAI Number: RAI-FC-1

Provide a status and intention of use of the fuel currently stored at PNP along with initial re-loading strategy. This information should include fuel enrichment level, re-loading plans for fuel onsite, additional fresh fuel to be shipped to the site for the first re-loading, and the expected burnup level(s).

Enclosure 2, "*Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant*", did not provided a description of intended fuel characteristics to be used to make a determination of the uranium fuel cycle impacts related to the proposed actions. Part of the information being requested is in connection to RAI TR-2.

HDI Response to RAI:

There are no planned changes to the core design. Holtec is planning on receiving 64-72 new fuel assemblies for the Cycle 29 Core Reload, as if Cycle 28 just happened. The design is in progress and has not been finalized yet. Based on that, Holtec will be using 132 to 140 of the previously burned fuel assemblies. Holtec receives new fuel from Framatome. Enrichment is limited in the Palisades core design to no more than 4.54 wt%. Also, maximum pin burnup shall not exceed 62.0 GWD/MTU (gigawatt days per metric ton of uranium) and the maximum assembly burnup shall not exceed 58.9 GWD/MTU.

References:

None.

Associated Attachments:

None.

Enclosure 25
HDI PNP 2024-037

Enclosure 25
HDI PNP 2024-037
Response to Request for Additional Information –
RAI-TR-2
Regarding the Proposed Reauthorization of Power Operations of
Palisades Nuclear Plant Under
Renewed Facility Operating License No. DPR-20

NRC RAI Number: RAI-TR-2

Describe the baseline affected environment and impacts of transportation of fresh fuel and spent fuel as they relate to restart-related activities and return to power operations. Please provide expected type and quantity of material that will be transported.

A description of the baseline affected environment and related transportation of fresh fuel is needed to determine impacts of the proposed actions. Enclosure 2, "*Environmental New and Significant Review Proposed Resumption of Power Operations Palisades Nuclear Plant*" did not provide this information.

HDI Response to RAI:

While there currently is no plan to transport spent fuel, Holtec will not be changing the amount of spent fuel generated. New fuel shipments are expected over several weeks after Holtec receives the operating license in order to receive radioactive materials. The new fuel shipments will remain typical, which is 60 to 72 new fuel assemblies, usually 6 canisters per truck, 2 assemblies per canister. This usually amounts to 5 to 6 truckloads over several weeks.

References:

None.

Associated Attachments:

None.