

REV1 TECHNICAL REPORT

ARCHITECTURAL HISTORY SURVEY OF PALISADES NUCLEAR PLANT, VAN BUREN COUNTY, MICHIGAN

PREPARED FOR

ENERCON 1601 Northwest Expressway, Suite 1000 Oklahoma City, OK 73118

PREPARED BY

SEARCH, INC. 8600 Oak Street #2A New Orleans, LA 70118

SEARCH PROJECT NO. 240140

OCTOBER **2024**

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OCTOBER 2024

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EXECUTIVE SUMMARY

SEARCH conducted an architectural history survey of the Palisades Nuclear Plant (PNP) in Covert Township, Van Buren County, Michigan, on June 19, 2024. SEARCH was contracted by ENERCON on behalf of Holtec International (Holtec) to fulfill historic property identification requirements under Section 106 of the National Historic Preservation Act (NHPA) of 1966. The survey included buildings and structures within the Survey Area that were built prior to 1980.

The results of the architectural history survey support ENERCON in the preparation of an Environmental Report for Holtec. Holtec is considering submittal of a Subsequent License Renewal Application to the US Nuclear Regulatory Commission (NRC) for an extended operating period and a Construction Permit Application to include two new modular reactor units. The Environmental Report is required under the National Environmental Policy Act of 1969 as part of this application process for a nuclear power plant subject to Title 10 of the Code of Federal Regulations (10 CFR) Part 50 (Domestic Licensing of Production and Utilization Facilities), 10 CFR Part 52 (Licenses, Certifications, and Approvals for Nuclear Power Plants), and the associated review under 10 CFR Part 51 (Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions). SEARCH is conducting a concurrent archaeological survey to provide historic and cultural resource information to the Environmental Report. In an email to SEARCH dated April 1, 2024, providing pre-consultation comments on the archaeological work plan, the Michigan State Historic Preservation Office (SHPO) recommended an architectural history survey and NRHP evaluation of the PNP since the plant is more than 50 years old. The architectural history survey results are reported herein, and the archaeological survey results are presented in a separate technical report.

The purpose of the architectural history survey is to identify and provide National Register of Historic Places (NRHP) recommendations for aboveground cultural resources within the PNP. The survey was conducted in accordance with the 2018 Michigan Above-Ground Survey Manual as well as the NRC requirements, Section 106 of the NHPA, as amended (Public Law 113-287 [Title 54 United States Code]), and implementing regulations of 36 CFR Part 800 (Protection of Historic Properties). A review of the NRHP database determined there are no NRHP-listed resources previously recorded within the Survey Area. SEARCH identified 14 newly recorded pre-1980 resources within the Survey Area. Additionally, one resource, the PNP Building, consists of five interconnected facilities. During the survey, architectural historians digitally photographed these resources and recorded resource locations on ESRI imagery using ArcGIS Collector and Survey 123. SEARCH recommends one newly recorded facility within the PNP Building, the ca. 1971 Containment Building, is eligible for NRHP inclusion for its significance under Criterion C (Architecture and Engineering). SEARCH recommends all other resources surveyed not eligible for NRHP inclusion. SEARCH also completed a Michigan SHPO Architectural District/Complex Identification Form for the PNP Complex and evaluated its NRHP eligibility as a whole. SEARCH recommends the PNP Complex is not eligible for NRHP inclusion as a potential historic district. No further architectural history work is recommended for the Survey Area.

Angelique Theriot, MA, served as Principal Investigator for the architectural history survey. Ms. Theriot meets the Secretary of the Interior's *Standards and Guidelines for Architectural History and Historic Preservation* (48 FR 44716-42). The architectural history fieldwork was completed by Ms. Theriot and Leeanne Mahoney, MPS.

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ACRONYMS AND ABBREVIATIONS

AEC	Atomic Energy Commission
ас	acres
ca.	circa
ft	feet
ha	hectares
IAEA	International Atomic Energy Agency
kV	kilovolt
m	meters
NHPA	National Historic Preservation Act
NRC	United States Nuclear Regulatory Committee
NRHP	National Register of Historic Places
NRTS	National Reaction Testing Station
PNP	Palisades Nuclear Plant
SEARCH	SEARCH, Inc.
SHPO	Michigan State Historic Preservation Office
TW.h	terawatt hours
US	United States
USDOE	United States Department of Energy
USGS	United States Geological Survey

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INTRODUCTION

SEARCH conducted an intensive architectural history survey of the Palisades Nuclear Plant (PNP) in Covert Township, Van Buren County, Michigan, on June 19, 2024 (**Figure 1**). The Survey Area includes the entire PNP: an approximately 175-hectare (ha) (432-acre [ac]) area bound by Lake Michigan to the west, Blue Star Highway to the east, Van Buren State Park to the north, and a private parcel to the south. The architectural history survey results support ENERCON in the preparation of an Environmental Report (ER) for Holtec. Holtec is considering submittal of a Subsequent License Renewal Application to the US Nuclear Regulatory Commission (NRC) for an extended operating period, as well as a Construction Permit Application to include two new modular reactor units within the PNP. The ER is required under the National Environmental Policy Act of 1969 as part of this application process for a nuclear power plant subject to Title 10 of the Code of Federal Regulations (10 CFR), Part 50 (Domestic Licensing of Production and Utilization Facilities), 10 CFR Part 52 (Licenses, Certifications, and Approvals for Nuclear Power Plants), and the associated review under 10 CFR Part 51 (Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions).

SEARCH is conducting a concurrent archaeological survey to provide historic and cultural resource information to the Environmental Report. In an email to SEARCH dated April 1, 2024, providing pre-consultation comments on the archaeological work plan, the Michigan State Historic Preservation Office (SHPO) recommended an architectural history survey and NRHP evaluation of the PNP since the plant is more than 50 years old. The architectural history survey results are reported herein, and the archaeological survey results are presented in a separate technical report.

In total, SEARCH identified 14 newly recorded pre-1980 resources within the Survey Area. Additionally, one resource, the PNP Building, consists of five interconnected facilities (see **Figure 6**). The report conforms to Michigan SHPO guidelines. Following this introduction, the report includes five chapters: Background Research, Research Design and Methods, Architectural History Results, and Conclusion and Recommendations. References Cited completes the body of the report. SHPO Architectural Properties Identification Forms are provided in **Appendix A**.



Figure 1. Survey Area Location, Van Buren County, Michigan.

BACKGROUND RESEARCH

PREVIOUS INVESTIGATIONS AND RECORDED CULTURAL RESOURCES

SEARCH reviewed the NRHP database prior to fieldwork to identify previous cultural resource investigations and previously recorded resources within the Survey Area. No previously recorded NRHP-listed or -eligible resources are located within the Survey Area.

HISTORIC CONTEXT

The PNP, designed and constructed by the Bechtel Company between 1967 and 1970, operated a 2-loop Pressurized Light-Water Reactor with electrical generating equipment to produce nuclear-derived power from 1971 to 2022. The reactor and nuclear steam supply systems, designed by Combustion Engineering, are part of a closed-cycle, mechanical draft-cooled facility, with a containment vessel utilizing pre-stressed concrete lined with carbon steel with a top dome and flat base. The Westinghouse Electric Company-designed turbine-generator rotating at 1,800 RPMs provided power through Consumers Power Company (until 2005) and then Entergy (until 2022). The plant is located on Lake Michigan in Covert Township, Van Buren County, Michigan. The historic context presented below first situates the PNP within the technological history of nuclear power in the US and then discusses its siting, construction, and operation within the Survey Area including its impact on local communities in Covert Township.

Nuclear Power Development in the US

The development of powerful weaponry dominated research on nuclear reactions during World War II and the Cold War. Governments around the world tasked scientists with creating nuclear bombs and missiles during World War II and nuclear technology related to weaponry progressed rapidly during the mid-to late twentieth century. Though much of the global focus remained on weaponizing nuclear reactions, scientists and government officials also understood domestic energy potenial. Soon after World War II, which ended at least partially due to the use of atomic weapons on the Japanese cities of Hiroshima and Nagasaki, the US established governmental infrastructure to develop nuclear power for civilian energy purposes.

Scientists first discovered nuclear fission in the 1930s, learning that splitting atoms produced a release of energy that could be replicated. European scientists -- including Enrico Fermi in Rome, Otto Hahn and Fritz Strassman in Germany, Lise Meitner in Austria, and Niels Bohr in Denmark-tested atom splitting and eventually brought their findings to the US. These scientists involved German-born physicist Albert Einstein in their work. Several researchers led by Fermi, who relocated from Rome to the University of Chicago, successfully created a self-sustaining nuclear reaction in December 1942. With the practical application of nuclear theories complete, the nuclear age began. Though the Manhattan Project created weapons with unprecedented destructive power, the original and future purposes of this research remained in developing a new source of energy (US Department of Energy [USDOE}1993:4–7).

The US created the Atomic Energy Commission (AEC) in 1946 and tasked it with researching and understanding the uses of nuclear power, including both weaponry and the development of energy technologies for civilian purposes. The Federation of Atomic Scientists pushed for additional civilian control and oversight in nuclear technology experimentation, as the classified nature and secrecy of military weapons development hampered cooperation between scientists and delayed progress. Additionally, many scientists involved with these projects called for a ban on atomic weapons production and a complete focus on creating clean energy solutions through nuclear power (Cantelon et al 1991:69–70). During the late 1940s and 1950s, the AEC directed several projects to assess the ability of nuclear power to provide energy for commercial purposes. In 1949, AEC authorized the first venture, Experimental Breeder Reactor I in Arco, Idaho. By the end of 1951, the reactor successfully lit four 200-watt lightbulbs, demonstrating the capabilities of commercial energy production with nuclear reactions. By 1955, the facility provided power to the small town of Arco, with a population of around 1,000, making it the first town powered by nuclear technology (USDOE 1993:8-14; US Nuclear Regulatory Commission [NRC] 2020).

The development spurred additional private and commercial interest in using this technology for power purposes and pushed the US government to contribute additional funding and support. After his 1953 "Atoms for Peace" speech urging the world to explore the benefits of nuclear power, President Dwight Eisenhower signed the Atomic Energy Act in 1954, bolstering the AEC's ability to research and develop commercial nuclear facilities and providing additional support for private investment in the nuclear energy sector (USDOE 1993:8-14; NRC 2020). By 1957, a large-scale nuclear power plant was operational in Shippingport, Pennsylvania, marking "the first commercial electricity-generating plant powered by nuclear energy". The Shippingport facility operated as a light-water reactor, which used "ordinary water to cool the reactor core" during the heating process, creating and cooling the self-sustaining chain reaction nuclear scientists studied since the early 1940s (USDOE 1993:8).

The height of nuclear energy production occurred between the 1950s and 1960s. Though growth continued into the 1970s and 1980s, energy companies invested less in nuclear power because of public concern over the safety of nuclear facilities and the disposal of nuclear waste. Much of this concern stemmed from the 1979 events at Three Mile Island in Pennsylvania. No one was harmed, but the accident perpetuated the fear of nuclear power reactor failure and the fallout that could occur. In 1971, 21 power plants were operational in the US and provided 2.4% of the country's power. This rose to 72 reactors providing 12% of electricity in 1979, and then 109 reactors providing 19% in 1989. By 1992, nuclear power provided 22% of the electricity in the US. Many of the original nuclear power facilities began to close by the 1990s, by which point the industry was in decline and saw minimal investment by energy companies (USDOE 1993:8–21).

Though researchers hypothesized water could be used as a means of transferring the heat of nuclear reactions to useable energy, it was not a foregone conclusion. The sensitivity of the fission elements and potential for accidental radioactive release meant significant testing was required to assure water boiled at a consistent rate. Slight temperature change or the inability to maintain a smooth, consistent water surface could have devastating effects. Samuel Untermyer II, a vocal proponent of boiling water's potential as a cooling method, began experimenting with this process in the 1950s. After graduating from MIT in 1934, Untermyer and Walter Zinn developed the Boiling Water Reactor Experiment (BORAX) to test the hypothesis (*New York Times*

31 January 2001:A19; Stacy 2000:128–130). The University of Chicago's Argonne National Laboratory helped conduct the experiments at the National Reaction Testing Station (NRTS) in Idaho. By May 1953, the first testing reactor was complete and ready for experiments. Untermyer and the team conducted over 200 tests within 14 months, solidifying his theory and proving the success of a BWR. At the end of these experiments, the team held a "threshold" test leading to the assumed destruction of the facilities in order the prepare for potential fallout. After the first threshold test, the team built a new, larger reactor known as BORAX II. The series continued through BORAX V (Stacy 2000:128–131).

The success of the BORAX testing units encouraged the development of private commercial facilities. Several ventures were already in development in the early 1950s and became operational by the mid- to late 1950s. The power provided to Acro, Idaho, beginning in 1955 was made possible by the BORAX III BWR. Other nuclear power facilities came online during the 1950s, including the Sodium Reactor Experiment in Santa Susana, California. It became the first nuclear facility in the state to power a commercial grid serving the city of Moorpark (USDOE 1993:13-15). As opposed to the BWR process, this facility used sodium to cool the reactions. When it began supplying power to the grid on July 12, 1957, the facility was recognized as "the country's first civilian nuclear plant and the first 'commercial' nuclear power plant to provide electricity to the public" (California Energy Commission 2020:7).

Pressurized Water Reactors

While boiling water reactors (BWRs) proved highly useful to nuclear power plant development, the technology was not the only means of producing safe and useful energy from fission. Beginning in the 1940s, the US Navy worked in coordination with the AEC to produce nuclear power through pressurized water reactors (PWRs). Also classified as a light-water reactor, PWRs use water as part of the cooling process though the water does not reach boiling temperature. Instead, pressurized water specifically works to prevent the water from boiling while serving as the coolant, moderator, and heat-transfer agent. These power generators required two systems, with pressurized water passing through the reactor core in a primary system and transferring its heat energy to a secondary water loop generating the steam necessary to power a turbine. The Navy and AEC oversaw early PWR research in tandem, with the former designing ships and submarines using the technology, and the latter developing commercial power possibilities (Duncan 1990:3-4).

As was the case with BWRs, research for PWRs involved overlapping and coordinated efforts between US governmental agencies and private energy companies working to develop new technologies. The development of nuclear-powered submarines and ships provided the impetus for the technology. Admiral Hyman G. Rickover of the US Navy led its development from the 1940s through the 1970s (Duncan 1990:12–13). In 1946, work on the first PWR began at the Oak Ridge National Laboratory, a governmental facility created for the Manhattan Project to research the extraction and use of plutonium and uranium (Freeman 2015:1). Working with Alvin Weinberg, the director of Oak Ridge National Laboratory, Rickover directed a team of scientists and engineers to develop a nuclear-powered water reactor capable of propelling a submarine.

Beginning in 1948, the Naval Nuclear Propulsion Program authorized additional research and development of PWR at the Bettis Atomic Power Laboratory operated by the Westinghouse Electric Corporation. In 1949, Rickover was appointed the head of the Naval Nuclear Propulsion Program, also known as the Naval Reactors, and to an administrative position within the AEC, further pointing to the cooperation between the civilian and military agencies. Both governmental agencies also worked directly with private companies. These combined efforts resulted in the first operational nuclear-powered submarine, *Nautilus*, in 1955 (Duncan 1990:13–14; Marguet 2022:16–22; Naval Nuclear Laboratory 2021).

The successes of these collaborative projects in constructing PWR for military purposes helped further research into domestic energy use. The experiments at Oak Ridge National Laboratory and Bettis Atomic Power Laboratory led directly to the development of the Shippingport facility. Working in tandem with Westinghouse, the AEC directed its Naval Reactors division, headed by Rickover, to modify a PWR designed for an aircraft carrier for commercial power use. The Duquesne Light Company served as the local utility partner. A groundbreaking ceremony in September 1954 included President Eisenhower, the director of the AEC, and officials from Duquesne Light and Westinghouse, with the highly anticipated event broadcast across the country. In addition to providing power to the Pittsburgh area, the Shippingport facility was specifically designed as a test study in the usefulness of nuclear power reactors to commercial energy. This was officially achieved in 1957 when the facility went critical, supplied power to the grid, and became the first nuclear power plant to supply commercial energy in the US (American Society of Mechanical Engineers 1980).

Post-Tensioned Concrete Construction

Containment structures played a critical role in US nuclear facility construction, as safety was considered paramount in the development of nuclear power. Considerations about the need for containing nuclear materials in the event of reactor failure date to the earliest organized AEC activities. In 1947, the AEC organized the Reactor Safeguards Committee, later known as the Advisory Committee on Reactor Safeguards (ACRS) (US Nuclear Regulatory Committee 2020). At its first meeting that year, the committee discussed the role containment structures needed to play and considered them critical to the protection of locals living near these sites (Tanguy 1988).

From the outset of US nuclear power plant construction, concrete served as the primary building material for containment structures to prevent radioactive material release in the event of failure. By 1953, the Shippingport facility plan included a containment structure. The reactor and its water-carrying systems would be housed within "four inter-connected containment vessels" made of steel-reinforced concrete "in order to prevent the possibility of radioactivity escaping into the environment" (American Society of Mechanical Engineers 1980:4, Tanguy 1988).

Researchers introduced the use of post-tensioned concrete to increase the strength and durability of concrete containment structures. Using steel-reinforced concrete, these systems use high-strength steel tendons in wire, strand, or bar form, which are "installed, tensioned, and then anchored to the hardened concrete . . . to apply compressive forces to the concrete to

provide increased resistance to concrete cracking" (Naus 2007:12–13). Post-tensioning provides an active system, with the anchored tendons strengthening the already reinforced concrete structure. Tendons are anchored by conduits or ducts within the containment structure and can then be post-tensioned for one or both ends. Once the tendons are in place, buttonheads, wedges, or nuts can be used as anchors, which are then protected from corrosion through bonded (cement grout) or unbonded (grease) methods (Naus et al. 1992:4).

The PNP's Containment Building was the first concrete containment building constructed for a nuclear facility that was "post-tensioned, in both directions, with fully prestressed walls and dome" (Liaw et al. 1981:2). Following the construction of PNP, newly constructed nuclear facilities frequently used post-tensioned concrete containment structures. Though this did not become a standard practice for all new nuclear sites, post-tensioned concrete structures came to represent the "single largest class of containment structures," with 37 of the 100 operational sites nuclear sites using this type of facility in 2014 (Jones et al. 2015:1–1).

Siting, Construction, and Operation of Palisades Nuclear Plant

In January 1966, Consumer Power Company announced its intention to build a massive nuclear power facility on the shore of Lake Michigan. Estimated at a cost of \$100 million, the plan proposed one of the biggest nuclear power producing facilities in the US, and the largest construction project in southwestern Michigan history. The company acquired 600 acres in Van Buren County the previous year. At the time of its announcement, Consumers Power Company expected to have the facility operational by 1970, pending AEC approval. The massive project served as just part of Consumers Power Company's investment in providing energy to Michigan. In addition to the new plant, the Company planned to spend an additional \$480 million to improve its traditional electric and natural gas systems in the state. Consumers Power Company also constructed Michigan's first nuclear power plant, Big Rock Point, which began operating in 1963 and gave the Company the knowledge and confidence to conceptualize the PNP project. However, the PNP project was approximately ten times the size of the Big Rock Point project. Its location on Lake Michigan provided the abundant water source needed to operate the light-water reactors (*The News-Palladium* 28 Jan 1966a:1, 28 Jan 1966b:1).

The chosen site for the PNP was a forested parcel located immediately north of Palisades Park, a lakeside community and resort. Aside from seasonal tourism, the economy of the region was primarily agricultural including berry farms and orchards. Modern settlement of Van Buren County began in the 1830s, though the area overall remained sparsely populated until the midnineteenth century. Between 1860 and 1870, the population grew significantly, increasing nearly two-fold from just over 15,000 to nearly 29,000. However, the following decades saw far less growth, climbing to 30,807 in 1880, dropping slightly to 30,541 in 1890, and modestly increasing to 33,274 in 1900 (Rowland 1912). Even though Michigan experienced some of the largest statewide growth in the nation in the first decades of the twentieth century, Van Buren County did not; while the population of the state more than doubled between 1900 and 1930, Van Buren County's population declined during the same period, dropping to 32,637 by 1930 (Forestall 1996; Legislative Council, State of Michigan 2002). Much of the statewide increase was attributed

to the large-scale expansion of the auto industry, an influx of immigrants, and the growth of urban areas (Legislative Council, State of Michigan 2002). Industry in Covert Township and Van Buren County in the first half of the twentieth century largely revolved around fruit and other small-scale farming, following the decline of the lumber industry. Many white-collar industries, including real estate, banking, and transportation, provided additional opportunities. Van Buren County did not experience the economic boom that the manufacturing centers of Michigan experienced during the World War II era, and the population remained under 40,000 through 1950 (Forestall 1996; Legislative Council, State of Michigan 2002; Rowland 1912).

By the 1960s, Consumers Power served as one of the largest energy companies in Michigan, providing electricity to nearly one million people in Lower Michigan. The company began in the 1880s as the Jackson Electric Light Works in Jackson, Michigan. Brothers William A. Foote and James Berry Foote formed Jackson Electric Light Works to use hydroelectric power to light streetlights in the town. In 1904, after acquiring numerous smaller utility and power companies, the company consolidated as Commonwealth Power. In 1910, it merged with other electricity ventures in eastern Michigan to form Consumers Power Company, with William A. Foote as its president (Shaw 2017).

In selecting the PNP site, Consumers Power Company negotiated land exchanges with the state of Michigan, with the former gaining inland state-owned land and the latter receiving beach property to expand Van Buren State Park. In addition, the state realigned the route of State Highway 31 to travel outside of the plant property and the state park (US Atomic Energy Commission [AEC] 1972). Compared with earlier nuclear sites, the PNP project differed in that the reactor would be built on site rather than delivered in completed form. In March 1967, Consumers Power Company received a Provisional Construction Permit (CPPR-25) allowing the company to begin construction on the facilities (ENERCON 2023). In October 1968, the reactor vessel arrived at the site via a river barge with over 900 tons of equipment making its way to the site (Lutz 1968). After construction completion and the arrival of nuclear fuel in 1970, the Company hoped the plant would be online on schedule. However, given the novelty of nuclear power, several citizens and environmental groups protested its opening over concerns about pollution to Lake Michigan and nuclear waste disposal. Protesting groups included the Concerned Petitioning Citizens, the Michigan Lakes and Streams Association, the Michigan Steelhead and Salmon Fisherman's Association, the Sierra Club, and Thermal Ecology Must be Preserved (TEMP). The largest collective concern of these groups involved the use of Lake Michigan water; specifically, environmental and fishing groups worried that the return of heated water used in the energy-producing process would drastically change the lake temperature and disrupt the entire ecosystems within the area (AEC 1972; Beck and Henkel 2004).

In response, the AEC delayed licensing the plant for operation, later determining that future facilities would have to consider environmental challenges as part of its standard procedures. In March 1971, in response to Consumers Power Company's pledge to build cooling towers for water returned to Lake Michigan, the environmental groups ended their complaint against the licensing process. By the end of 1971, the PNP produced its first electricity and was approved by the AEC to operate at 60% in March of the following year (*Traverse City Record-Eagle* 16 March 1971:18; Zipp 2014).

The plant's completion affected local communities in a variety of ways. Within Palisades Park, a history of the area noted that "Three Park cottages were dismantled or moved, the northern section of our beach was vacated, and a concrete behemoth arose just north of our boundary" (Beck and Henkel 2004:n.p.). Another Palisades Park resident recalled the plant's opening, writing:

Construction of the plant resulted in massive destruction to the natural environment where age old sand dunes and mature forests had withstood the test of time along the shores of Lake Michigan. Gigantic cranes and heavy-duty earth moving equipment was brought on site to level the sand dunes and demolish the forest . . . steel and concrete dominated the scene for years, as did the many hundreds of workers who came to work on this massive project (Beck and Henkel 2004:n.p.).

Other local people viewed the arrival of the plant in more favorable light. Jerry Sarno, an official for Covert Township, called building the facility "the correct decision," praising the site choice, heralding the arrival of jobs during construction and operation, and appreciating the increase in tax revenue for the area townships and schools (AEC 1972:A-145).

At the time of the plant's opening, Van Buren County had been experiencing far more growth than it had in the first half of the twentieth century. The 1960 census counted a population of 48,395, growing to 56,173 by 1970 (Forestall 1996). A 1972 environmental report provided details about the surrounding communities and the plant's effects on the local area, including the economic impact. Noting that the 50-mile radius around the plant include nine Michigan counties and three counties in Indiana, the report listed Van Buren County as the second least urbanized county (22%) of the 12, with South Haven reported as the county's largest incorporated city with a population of nearly 6,500. Over 17,000 people made up the county's workforce, with manufacturing (5,846 employees) and agriculture, forestry, and fisheries (2,472) serving as the largest industries. Though the number of workers was not specified, the report did indicate that most of the workers involved in the construction of the Palisades Nuclear site lived within a commutable distance. Annual payroll for operations of the plant were estimated at \$500,000 in 1972; though many of these positions required specialized training, the environmental study noted that much of the money paid to the plant's employees would likely enter the Van Buren County economy. In addition, the Palisades Nuclear Plant's tax assessment was valued at nearly \$1.3 million when first in operation, taking up a sizeable portion of Covert Township's and Van Buren County's overall number, providing a boon to area school funding (AEC 1972:II-4, XI-14). By 1978, the PNP employed 135 people, with an estimated 90% of these individuals moving within commuting distance of the plant. That year, its payroll amounted to \$2.26 million, and the facility held a tax assessment of \$2.35 million (NRC 1978:5-7—5-8).

In January 1973, events at the new facility legitimized concerns voiced by environmental groups, as the PNP shut down after leaking a small amount of radioactive water. A second closure followed in August 1973 after further leaks. In March 1974, the AEC ordered the facility to close over inadequately addressed management of safety issues, and by August 1974, it had significantly fined Consumers Power Company over several violations (Crandell 2013; Renner

1975; Zipp 2014). Fines and the shutdown of the site caused the company financial problems and the loss of expected power supply, leading to raising rates and losing workers. By June 1974, Consumers Power Company announced plans to lay off five percent of its total workforce, citing rising costs in addition to the difficulties it faced with the Palisades plant (The *Muskegon Chronicle* 4 June 1974:22). Consumers Power Company sued the engineering firm which designed PNP— the Bechtel Corporation—and several suppliers over PNP production and construction, settling for \$14 million in 1981. Throughout the late-twentieth and early-twenty-first centuries, the PNP regularly dealt with issues relating to leaks and improper handling of radioactive materials, frequently replacing defective portions of its equipment to continue operating (Crandell 2013; Renner 1975; Zipp 2014).

In the early 1990s, two additional issues at the Palisades Nuclear Plant caused concern for citizens in the area, as well as those throughout the state and Lake Michigan region. As the plant's spent fuel storage pool would be full by 1992, the PNP made plans for storing used radioactive fuel rods in aboveground storage facilities known as dry casks, made of steel and concrete. The PNP planned to have 25 of these 16-foot containers containing radioactive material on the shores of Lake Michigan; though the plant and the NRC deemed the containers safe, residents were concerned about the added possibility of contaminating the lake waters and worried about the lack of a long-term solution for nuclear byproducts. Additionally, the plant planned to replace its 480-ton steam generators, the largest repair project in the site's history. Though the previous track record of leaks and issues at Palisades provided enough cause for alarm, federal officials approved both projects (Lersten 1990; Perlman 1990).

The mid-twentieth century population growth of Van Buren County continued into later decades, though the pace slowed, reaching 66,814 in 1980; 70,060 in 1990; and 76,263 in 2000 (Forestall 1996; US Census Bureau 2001). In 2002, the county included nearly 24,000 workers; of these, 31% worked in agriculture; 28% in the service sector; and 21% in manufacturing. As the Palisades Nuclear Plant continued operations in this period, Consumers Energy (renamed in 1997) served as Van Buren County's largest single employer, with 484 employees in 2002. Additionally, the company remained the largest taxpayer in the county, contributing millions to local school districts, township governments, and county operations (NRC 2006). In 2007, the NRC extended the operating license for the plant an additional 20 years to 2031 (Lersten 2007).

In May 2022, the PNP was taken offline. Entergy indicated "the station was scheduled to be permanently shut down on May 31, but plant operators 'made the conservative decision to shut down the plant early due to the performance of a control rod drive seal' "(Power Magazine 2022). Before its closure, the PNP "set a site and world record for a plant of its kind, continuously generating electricity for 577 days since its last refueling" (Power Magazine 2022). By 2022, PNP employed 600 people. In March 2024, Holtec announced plans to repower PNP "thanks to a conditional loan guarantee from the US Department of Energy's Loan Programs Office" (Canary Media 2024). PNP would become the first previously decommissioned US nuclear reactor to restart and the second or third decommissioned reactor to repower in the world (Canary 2024). The PNP's repower reflects national interests to invest in fossil fuel alternatives.

RESEARCH DESIGN AND METHODS

NRHP CRITERIA

Cultural resources identified within the Survey Area were evaluated according to the NRHP criteria (36 CFR 60.4). As defined by the NPS (1997), the quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- A. that are associated with events or activities that have made a significant contribution to the broad patterns of our history; or
- B. that are associated with the lives of persons significant in our past; or
- C. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- D. that have yielded, or may be likely to yield, information important in prehistory or history.

In addition to the four criteria used to evaluate above-ground historic resources, the concept of integrity is also considered. "Integrity" is an important qualification of NRHP eligibility and can be related to any or all of the following (NPS 1997):

- Location: the place where the historic property (or properties) was/were constructed or where the historic event(s) occurred.
- Design: the combination of elements that create the form, plan, space, structure, and style of a property (or properties).
- Setting: the physical environment of the historic property (or properties).
- Materials: the physical elements combined to create the property (or properties) during the associated period of significance.
- Workmanship: the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory.
- Feeling: the property's (or properties') expression of the aesthetic or historic sense of the period of significance.
- Association: the direct link between the important historic event(s) or person(s) and the historic property (or properties).

NRHP-eligible districts must possess a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development. NRHP-eligible districts and buildings must also possess historic significance, historic integrity, and historical context.

BACKGROUND RESEARCH

Background research involved a review of available information for the Survey Area. This included a review of the NRHP database, historic maps and aerial photographs, and documents on-site at PNP. SEARCH conducted this background research and literature review to provide information about the region's environment, general prehistoric and historic occupation, and context for resources identified during survey.

ARCHITECTURAL HISTORY METHODS

SEARCH conducted architectural history survey in compliance with SHPO survey guidance, specifically the 2018 *Michigan Above Ground Survey Manual*. The main goals of this survey were to:

- Identify historic-age architectural history resources within the Survey Area; and
- evaluate historic-age architectural history resources within Survey Area for NRHP eligibility.

The architectural history survey used SHPO survey procedures for the location, investigation, and recordation of historic resources 45 years old or older. SEARCH architectural historians reviewed USGS quadrangle maps and historic aerial photographs to identify pre-1980 resources. Field survey documented extant historic-age buildings, structures, and objects within the Survey Area. SEARCH architectural historians photographed resources with a digital camera, and recorded pertinent information regarding architectural style, distinguishing characteristics, and condition. Architectural historians reviewed construction dates available through PNP site maps, historic topographic maps, and aerial photographs to determine which resources were surveyed.

Upon completion of fieldwork, dates of construction, design, architectural characteristics, overall condition, and resource location were carefully considered. SEARCH evaluated each resource's significance and eligibility NRHP inclusion, and recommended it "eligible" or "not eligible".

ARCHITECTURAL HISTORY RESULTS

The architectural history survey resulted in the identification and evaluation of 14 newly recorded historic resources within the Survey Area (**Table 1; Figure 2**). Additionally, one resource, the PNP Building, consists of five interconnected facilities. The individual facilities comprising the PNP Building are:

- Service Building
- Administration Building
- Auxiliary Building
- Containment Building
- Turbine Building

SEARCH recommends one newly recorded facility within the PNP Building, the ca. 1971 Containment Building, is eligible for NRHP inclusion for its significance under Criterion C (Architecture and Engineering). SEARCH recommends all other resources surveyed not eligible for NRHP inclusion. SEARCH did not survey any buildings, structures, or additions within the Survey Area that were built after 1980 (i.e., those not yet of historic age). SEARCH completed a Michigan SHPO Architectural District/Complex Identification Form for the PNP Complex and evaluated its NRHP eligibility as a whole. SEARCH recommends the PNP Complex is not eligible for NRHP inclusion as a potential historic district. Resource descriptions and NRHP evaluations are included in detail below.

Resource Name	Address	Resource Type	Style	Year Built	Recommended NRHP Status	
Palisades Nuclear Plant Complex	27780 Blue Star Highway, Covert MI	Industrial	Industrial Vernacular, No Style	ca. 1967– 1979	Not Eligible	
Palisades Nuclear Plant Building	27780 Blue Star Highway, Covert MI	Industrial	Industrial Vernacular	ca. 1971– 1979	Not Eligible	
Service Building	N/A	Industrial	Industrial Vernacular	ca. 1971	Not Eligible	
Administration Building	N/A	Industrial	Industrial Vernacular	ca. 1971	Not Eligible	
Auxiliary Building	N/A	Industrial	Industrial Vernacular	ca. 1971	Not Eligible	
Containment Building	N/A	Industrial	Industrial Vernacular	ca. 1971	Eligible	
Turbine Building	N/A	Industrial	Industrial Vernacular	ca. 1979	Not Eligible	
Tank	27780 Blue Star Highway, Covert MI	Industrial	No Style	ca. 1979	Not Eligible	
Feedwater Purity Building	27780 Blue Star Highway, Covert MI	Industrial	Industrial Vernacular	ca. 1979	Not Eligible	
Discharge Structure	27780 Blue Star Highway, Covert MI	Industrial	No Style	ca. 1968	Not Eligible	

Table 1. Architectural History Survey Results.

Resource Name	Address	Resource Type	Style	Year Built	Recommended NRHP Status	
Cooling Tower	27780 Blue Star	Industrial	Industrial	ca 1968	Not Eligible	
Pump House	Highway, Covert MI	industrial	Vernacular			
South Radwaste	27780 Blue Star	Inductrial	Industrial	co 1070	Not Eligible	
Building	Highway, Covert MI	industrial	Vernacular	ca. 1979	NOT Eligible	
Substation	27780 Blue Star	Industrial	No Style	co 1069	Not Eligible	
Substation	Highway, Covert MI	industrial		ca. 1908		
Security Building	27780 Blue Star	Industrial	Industrial	co 1070	Not Eligible	
	Highway, Covert MI		Vernacular	ca. 1979		
East Storage	27780 Blue Star	Industrial		aa 1070	Not Eligible	
Building	Highway, Covert MI	industrial	Vernacular	Ca. 1979	NOT EIIBIDIE	
East Radwaste	27780 Blue Star	Inductrial	Industrial	co 1070	Not Eligible	
Building	Highway, Covert MI	industrial	Vernacular	ca. 1979	NOT Eligible	
Meteorological	27780 Blue Star	Inductrial	No Style	co 1070	Not Eligible	
Tower	Highway, Covert MI	industrial	NO Style	Ca. 1979	NOT EIIBIDIE	
Post-Tensioning	27780 Blue Star	Inductrial	No Style	ca. 1967	Not Eligible	
Testing Structure	Highway, Covert MI	industrial				
Chesapeake and	27790 Plus Star					
Ohio Railroad	Lighway Covert MI	Transportation	No Style	ca. 1967	Not Eligible	
Spur	nighway, Covert Ivii					

Table 1. Architectural History Survey Results.



Figure 2. Architectural History Survey Results.

ARCHITECTURAL STYLES REPRESENTED IN THE SURVEY AREA

The Survey Area contains styles that represent the development of industrial and utilitarian architecture in the US during the mid-twentieth century. **Table 2** provides the architectural styles in the Survey Area, along with the number and percentages of resources of each style. The PNP Complex as a whole is omitted from **Table 2** as it encompasses both styles.

Table 2. Architectural Styles within the Survey Area.					
Architectural Style	Number of Examples	Percentage			
Industrial Vernacular	7	53.85%			
No Style	6	46.15			
Total	13	100.00%			

Table 2.	Architectural	Styles	within	the	Survey	Area
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Industrial Vernacular

There are seven Industrial Vernacular-style buildings within the Survey Area (Figure 3). Buildings erected for commercial and industrial use characterize the Industrial Vernacular style. Metal or wood frame materials are commonly used in construction. Wood, concrete, masonry or metal clad the building panel exteriors, with factoryproduced metal paneling more prevalent throughout the mid- to late-twentieth century. There are typically no predominant decorative



architectural details, as the buildings "responded to the functional needs of the operations they housed and seldom were influenced by design innovations or stylistic movements" (Ochsner 2014:353). Industrial Vernacular buildings are frequently found within energy sector-related and nuclear power plant properties nationally.

Characteristics of the Industrial Vernacular style often include, but are not limited to:

- Utilitarian or unornamented design;
- Use of popular, mass produced twentieth century materials such as concrete, aluminum, glass, steel, asbestos, and plastics;
- Metal framed windows of various configurations; and
- Flat roofs (Jevremovic et al. 2012).

No Style

This term is generally applied to buildings, structures, objects, or transportation resources that do not display one singular style, or to which style does not pertain. Six resources within the Survey Area possess no style.

NRHP EVALUATIONS

Palisades Nuclear Plant Complex

The Palisades Nuclear Plant Complex includes 13 ca. 1967–1979 buildings and structures on an approximately 175 ha (432 ac) parcel, and includes the PNP building and its supporting facilities. The earliest topographic quadrangle map of the area, 1927 *South Haven, MI.*, depicts the PNP Complex within an undeveloped coastal area defined by low topography north of Palisades Park (USGS 1927). The PNP Complex is first depicted on 1981 *Covert, MI.*, though resources documented during survey date to ca. 1967–1979 (USGS 1981).

SEARCH identified 13 newly recorded historic age resources within the Survey Area (**Table 1**; **Figure 2**). One of these newly recorded resources, the PNP Building, consists of five interconnected facilities. Buildings and structures within the PNP Complex possess Industrial Vernacular style elements or possess no architectural style. Industrial vernacular style is "used to describe buildings constructed to facilitate the needs of industry" (The Spruce 2022). Overall, the resources are utilitarian in design and possess little to no exterior ornamentation. The buildings were constructed to serve utilitarian purposes within the PNP complex. For a full description of the resource's historic context and development, see Historic Context above. For individual resource descriptions and NRHP eligibility evaluations, see below.



Figure 4. PNP Complex, facing southeast (left); PNP Complex, facing southwest.

The PNP Complex is not the first nuclear plant constructed in Michigan. The PNP Complex as a whole represents a mid-twentieth-century nuclear plant with a PWR used for power generation. The complex is not associated with events that have made a significant contribution to the broad patterns of history and is recommended not significant under Criterion A. Background research indicates the complex lacks association with any person(s) significant in history and is recommended not significant B. Resources within the plant are industrial in design and utilitarian in use.

As discussed below in **Palisades Nuclear Plant Building**, the Containment Building is recommended individually eligible for NRHP inclusion under Criterion C as the first post-tensioned concrete reactor building constructed within the US. However, the other resources surveyed within the PNP Complex were not built using this construction method and do not share this association. The other historic-age resources surveyed within the PNP Complex represent common mid-to-late twentieth century Industrial Vernacular buildings found at both nuclear plants and industrial locations broadly. Historic aerial photographs indicate construction expanded within the parcel throughout the 1980s and 1990s as necessary. Other facilities were demolished or replaced throughout the PNP's history of use. Purpose-built resources, such as the Chesapeake and Ohio Railroad Spur and the Post-Tensioning Testing Structure, were abandoned in place and permanently disused after fulfilling construction needs (NETR 1976, 1980, 1981, 1997). For these reasons, SEARCH determined the PNP Complex's development lacks a significant concentration of buildings and structures "unified historically or aesthetically by plan or physical development" (NPS 1997:5). The PNP Complex as a whole generally lacks architectural or engineering distinction, and is recommended not significant under Criterion C.

The PNP Complex is recommended not significant under Criterion D because it lacks the potential to yield further information of historical importance. SEARCH recommends the PNP Complex is not eligible for NRHP inclusion as a historic district.

Palisades Nuclear Plant Building

The PNP Building is a ca. 1971–1979 Industrial Vernacular–style building comprised of five interconnected historic-age facilities with primary and auxiliary functions for electrical power generation (**Figure 5** and **Figure 6**). The building also consists of a nonhistoric ca. 1997 service building addition on the Service Building's northwest façade (NETR 1997). Construction on the site began in 1967, and PNP began operations on December 31, 1971. The 800-megawatt plant operated a single unit PWR between 1971 and its 2022 decommission. A CE 2LP (DRYAMB) Westinghouse turbine generator generates power at PNP when:

- 1. "The core inside the reactor vessel creates heat;
- 2. Pressurized water in the primary coolant loop carries the heat to the steam generator;
- 3. Inside the steam generator, heat from the primary coolant loop vaporizes the water in a secondary loop, producing steam; and
- 4. The steam line directs the steam to the main turbine, causing it to turn the turbine generator, which produces electricity" (NRC 2023).

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SEARCH Architectural History Survey of Palisades Nuclear Plant, Van Buren County, Michigan



Figure 5. PNP Building, southeast facade, facing west (left); Diagram of PWR power generation process (right) (NRC 2023).



Figure 6. PNP Building Facilities Detail Map.



Figure 7. Containment Building cross section (Liaw and Tsai 1981:3).

The reactor houses fuel assemblies, or groups of fuel rods consisting of metal tubes containing fissionable material. It is cooled using water drawn from Lake Michigan. Pumps within the Containment Building circulate the water. The PNP has supplied 232.35 terawatt hours (TW.h) of electricity since 1971 (IAEA 2024). The PNP building covers approximately 2.31 ас (0.93 ha), and its five interconnected historic-age facilities are depicted in Figure 5 and described below. The facilities comprising the PNP building are Industrial Vernacular in style, utilitarian in design, and feature minimal exterior ornamentation.

The **Containment Building** is a ca. 1971, multi-level, Industrial Vernacular–style building providing nuclear containment at PNP. The building has a cylindrical plan and is covered by a low-pitched dome roof (see **Figure 7**). The building:



Figure 8. Westinghouse steam generator example cross section (NRC 2023a.).

Houses the nuclear steam supply system (NSSS),

including the reactor, steam generators, primary coolants pumps and motors, pressurizer and quench tank, reactor auxiliaries, hydrogen recombiners, and containment building air coolers (No Author 2005:146).

Previous documentation indicates:

The inside diameter is 116 ft; the inside height is 189 ft. The containment walls are 3.5 ft thick, the dome is 3 ft thick, and the base slab varies in thickness between 8 ft and 13 ft. The containment building was the first in the US to be post-tensioned, in both directions, with fully prestressed walls and dome (Liaw and Tsai 1981:2).

The building's interior is concrete lined with 0.25 in carbon steel plates. Depending upon its design specifications, the generator within may be similar to the generator depicted in **Figure 8**. The Containment Building's post-tension system includes:
- "Three groups of 55 dome tensions oriented at 120 degrees to each other for a total of 165 tendons anchored at the vertical face of the dome ring girder;
- 180 vertical tendons anchored at the top surface of the ring girder and at the bottom of the base slab;
- Six groups of 87 hoop tendons enclosing 120 degree of arc for a total of 522 tendons anchored at the six vertical buttresses" (Liaw and Tsai 1981:2).

The *Turbine Building* is a ca. 1971 Industrial Vernacular "Design Class 3" facility attached to the Containment Building on its east façade (Figure 9). "Design Class 3" indicates the facility is categorized as a moderate seismic risk of radioactive release (NRC 2023b). The Turbine Building houses the Auxiliary Feedwater Pump Room, Electrical Penetration Enclosure, main turbine generator, and other infrastructure (Garcia 2015). The Turbine Building is of combined reinforced concrete and structural steel frame construction. Its exterior is clad with factory metal panel and its flat roof is covered with composite materials.

The *Administration Building* is a ca. 1971 two-story Industrial Vernacular–style facility attached to the Auxiliary Building on its west façade (**Figure 9**). The building is clad with concrete and rests on a concrete slab foundation. The building's flat roof is covered by a concrete deck. Fenestration includes fixed-pane metal frame and casement windows on the east façade. The building is reinforced concrete construction. Full height pilasters below a deep overhang divide the east façade, and its upper story is clad with enameled metal panels. The building is clad with smooth concrete on the north and south facades. The main entrance is offset on the east façade and enclosed by double metal frame doors.

The *Auxiliary Building* is a ca. 1971 multi-story Industrial Vernacular–style facility attached to the Administration Building on its east façade, and the Containment Building on its south façade (**Figure 9**). The facility houses "the spent fuel pool, radioactive waste treatment facilities, engineered safeguards components, heating and ventilating system components, the emergency diesel generators, switchgear, laboratories, offices and the control room" (No Author 2005: 147). The facility is of combined reinforced concrete and structural steel frame construction. Its exterior is clad with factory metal panel and its flat roof is covered with composite materials. The former ca. 1967 Chesapeake and Ohio Railroad Spur terminated at a central bay located behind a security fence on the facility's east façade. Subsequent additions are depicted on the building's northeast end by 1976 (NETR 1976; No Author 2005).

The *Service Building* is a ca. 1979 multi-story Industrial Vernacular–style facility attached to the Auxiliary Building's north façade (**Figure 9**). The facility is a combination of reinforced concrete and structural steel frame construction. Its exterior is clad with factory metal panel and its flat roof is covered with composite materials. The facility's main entrance is located on the south end of the east façade within a vestibule accessed by an elevated catwalk. Fenestration consists of linear banks of square fixed pane metal frame windows separate by full-height pilaster-like metal panel. A ca. 1997 addition is located at the north end of the facility's west façade (NETR 1997).

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Architectural History Survey of Palisades Nuclear Plant, Van Buren County, Michigan

SFARCH



Figure 9. Turbine Building, facing northeast (top left); Administration Building, facing west (top right); Auxiliary Building and addition, facing west (bottom left); Service Building, facing northwest (bottom right).

The PNP Building consists of five interconnected historic-age facilities: the Containment Building, Turbine Building, Administration Building, Auxiliary Building and Service Building. The facilities are not associated with events that have made a significant contribution to the broad patterns of history, and are recommended not significant under Criterion A. Background research indicates the plant lacks association with any person(s) significant in history, and is recommended not significant under Criterion B. The Turbine Building, Administration Building, Auxiliary Buildings and Service buildings generally lack architectural or engineering distinction and are recommended not significant under Criterion C. The facilities are recommended not significant under Criterion D because they lack the potential to yield further information of historical importance. SEARCH recommends the Turbine Building, Administration Building, Auxiliary Buildings and Service buildings are not eligible for NRHP inclusion.

The Containment Building was the first post-tensioned concrete reactor building constructed within the US. Currently, post-tensioned concrete construction containment structures represent the most common type of containment structures found at US nuclear plants. SEARCH recommends the Containment Building is significant under Criterion C for this association.

Architectural History Results

The Containment Building is located within its original footprint as an interconnected facility within the PNP Building and retains integrity of *location* and *setting*. The facility's post-tensioned concrete construction remains intact and retains integrity of *design*, *workmanship*, and *materials*. The facility retains its integrity of *feeling* and *association* as an integral part of PNP's past nuclear generating operations within the PNP Building footprint. The facility retains sufficient integrity to convey its significance under Criterion C (Architecture/Engineering). SEARCH recommends the Containment Building is individually eligible for NRHP inclusion.

Water Storage Tank

The ca. 1979 water storage tank located on the north side of the Service Building addition. The cylindrical tank is steel and rests on a concrete slab foundation. The structure is utilitarian in design and features no exterior ornamentation (**Figure 10**).

The water storage tank is an ancillary structure and is not associated with events that have made a significant contribution to the broad patterns of history. SEARCH recommends the resource is not significant under Criterion A. Background research indicates the



Figure 10. Water storage tank, facing southeast.

resource lacks association with any person(s) significant in history, and is recommended not significant under Criterion B. The resource's design is minimal, utilitarian, generally lacks architectural or engineering distinction and is recommended not significant under Criterion C. The resource is recommended not significant under Criterion D because it lacks the potential to yield further information of historical importance. SEARCH recommends the resource is not eligible for NRHP inclusion.

Feedwater Purity Building

The Feedwater Purity Building is a ca. 1979 multi-story Industrial Vernacular-style building located northwest of the Service Building addition (Figure 11). The building is alternately referred to as the "Condensate and Makeup Demineralizer Building" (No Author 2005: 147). The building houses the "raw water filtration system, the reverse osmosis pretreatment system, the makeup demineralizer system, regeneration chemicals handling feedwater system, purity air compressors, and related facilities" (No Author 2005:147).



Figure 11. Feedwater Purity Building, facing southeast.

The facility combines reinforced concrete and steel construction. Its exterior is clad with factory metal panel and its flat roof supports a concrete deck behind a low parapet (**Figure 10**). Fenestration includes louvered vents located along the building's upper story. A loading dock area on the northwest façade consists of a wide loading bay above a concrete ramp enclosed by a sliding single-track door, a loading bay above a recessed ramp enclosed by a roll-down garage door, and a cushion dock shelter above a concrete ramp. A small addition with a loading bay is located on northwest façade's east end. The building rests on an elevated concrete foundation. The building's northwest façade is enclosed by a security perimeter fence. Prefabricated metal observation booths are located on the building's flat roof at the northeast and southwest corners. The building is utilitarian in design and features no exterior ornamentation.

The feedwater purity building is an ancillary building and is not associated with events that have made a significant contribution to the broad patterns of history. SEARCH recommends the structure is not significant under Criterion A. Background research indicates the resource lacks association with any person(s) significant in history, and is recommended not significant under Criterion B. The resource's design is minimal, utilitarian, generally lacks architectural or engineering distinction and is recommended not significant under Criterion C. The resource is recommended not significant under Criterion D because it lacks the potential to yield further information of historical importance. SEARCH recommends the resource is not eligible for NRHP inclusion.

Discharge Structure

The ca. 1968 Discharge Structure is located west of the Cooling Tower Pump House on Lake Michigan. The structure releases wastewater into Lake Michigan (**Figure 12**). The structure consists of interlocking driven steel sheet piles supporting an encircling concrete platform. Water intake occurs "from a depth of about 20 ft, 3,500 feet offshore, raising its temperature as it is used for service water and dilution of cooling tower blowdown" (NRC 2023a.:11). The pilings enclose the structure's makeup basin and mixing basin. The structure is enclosed by various secured chain link perimeter fences. The structure possesses no style, is utilitarian in design, and features no exterior ornamentation.



Figure 12. Discharge Structure, facing west (left); facing northwest (right).

The discharge structure is an ancillary structure not associated with events that have made a significant contribution to the broad patterns of history. SEARCH recommends the structure is not significant under Criterion A. Background research indicates the resource lacks association with any person(s) significant in history, and is recommended not significant under Criterion B. The resource's design is minimal, utilitarian, generally lacks architectural or engineering distinction and is recommended not significant under Criterion D because it lacks the potential to yield further information of historical importance. SEARCH recommends the resource is not eligible for NRHP inclusion.

Cooling Tower Pump House

The cooling tower pump house is a multi-story ca. 1968 Industrial Vernacular-style ancillary building centrally located northwest of the Turbine Building (Figure 13). The building "contains two vertical pumps to circulate the tube side condenser cooling water to the cooling towers for the Circulating Water System, a warm water recirculation pump to allow circulating warm discharge effluent back to the intake structure for the service water pumps during winter months, and a chemical addition system to biofouling combat in the



Figure 13. Cooling Tower Pump House, facing north.

Circulating Water System" (No Author 2005:147). The facility is combined reinforced concrete and steel frame construction. Its exterior is clad with factory metal panel and its flat roof supports multiple large industrial vent hoods. Fenestration consists of louvered vents on the upper story, and entrances on the south and east facades enclosed by solid metal doors. A utilitarian full height ladder attached to the south façade provides roof access. Intake or discharge ductwork is fixed to the building's west façade. The building rests on a concrete foundation and has a rectangular plan. The building is utilitarian in design and features no exterior ornamentation. The cooling towers associated with this building south of the plant were replaced ca. 2014–2016.

The cooling tower pump house is an ancillary structure not associated with events that have made a significant contribution to the broad patterns of history. SEARCH recommends the structure is not significant under Criterion A. Background research indicates the resource lacks association with any person(s) significant in history, and is recommended not significant under Criterion B. The resource's design is minimal, utilitarian, generally lacks architectural or engineering distinction and is recommended not significant under Criterion C. The resource is recommended not significant under Criterion D because it lacks the potential to yield further information of historical importance. SEARCH recommends the resource is not eligible for NRHP inclusion.

South Radwaste Building

The south radwaste building is a single-story 1979 Industrial Vernacular-style ca. warehouse located southwest of the Turbine Building. The building houses storage for radioactive waste. The small building rests on a concrete foundation and is prefabricated metal construction (Figure 14). The building is covered by a metal front gabled roof with low pitch. Fenestration consists of small louvered vents and a narrow bay above a low concrete ramp on the south facade. The bay is enclosed by a roll-down metal door. The building is utilitarian in design and features no exterior ornamentation.



Figure 14. South Radwaste Building, facing south.

The south radwaste building is an ancillary building not associated with events that have made a significant contribution to the broad patterns of history. SEARCH recommends the building is not significant under Criterion A. Background research indicates the resource lacks association with any person(s) significant in history, and is recommended not significant under Criterion B. The resource's design is minimal, utilitarian, generally lacks architectural or engineering distinction and is recommended not significant under Criterion C. The resource is recommended not significant under Criterion D because it lacks the potential to yield further information of historical importance. SEARCH recommends the resource is not eligible for NRHP inclusion.

Switchyard

The ca. 1971 345 kV Switchyard is located approximately 0.57 km (0.36 mi) southeast of the PNP building. The switchyard is depicted on aerial photos in 1976 as approximately 5.47 ac (2.21 ha) in size. A ca. 2016 expansion increased the switchyard to approximately 7.30 ac (2.95 ha) (NETR 1976, 2016). The switchyard is located on a paved access road south of Palisades Power Plant Road. Per personal communication, the Switchyard is owned by Michigan Electric Transmission Company (METC); and HOLTEC Palisades owns discreet components within it (MacMaster 2024). However, its ownership does not change the resource's recordation or NRHP evaluation. The resource provides a link between PNP and the transmission lines, serving to link the power produced there to the grid (Figure 15). Previous documentation indicates "power output from the Palisades main generator is fed to the transmission grid via an overhead circuit between the main transformer...and the Palisades Switchyard" (No Author 2005: 153). The Switchyard is airinsulated, with powerlines suspended above the large outdoor space. The gantry structure configuration appears similar to its depiction on 1976 aerial photographs (NETR 1976). The Switchyard features a maintained gravel fill lot enclosed by a perimeter fence. Security access restricted any survey within the perimeter fence. The facility is utilitarian in design and features no exterior ornamentation.



Figure 15. Switchyard, facing southeast (left); switchyard control building obscured by perimeter fence, facing northeast (right).

A ca. 1971 one-story switchyard control house is located at the switchyard's west boundary. The building is concrete construction on a concrete slab foundation with rectangular plan. The building is covered by a flat concrete roof. Fenestration on the west façade consists of louvered vents and a metal door with small upper light. The building's north and east facades are obscured from view from the right of way.

The switchyard is an ancillary facility not associated with events that have made a significant contribution to the broad patterns of history. SEARCH recommends the resource is not significant under Criterion A. Background research indicates the resource lacks association with any person(s) significant in history, and is recommended not significant under Criterion B. The resource's design is minimal, utilitarian, generally lacks architectural or engineering distinction and is recommended not significant under Criterion C. The resource is recommended not significant under Criterion D because it lacks the potential to yield further information of historical importance. SEARCH recommends the resource is not eligible for NRHP inclusion.

Security Building

The Security Building is a one-story ca. 1979 Industrial Vernacular–style building located northwest of the Administration Building. Due to access permissions, no photographs of the Security Building's exterior were allowed during survey. The prefabricated metal building rests on a concrete slab foundation with an irregular plan. The building possesses no fenestration on the north, east, and south facades. The main entrance is offset on the north façade within a small vestibule sheltered by an attached canopy. A fence encloses the building's low pitched gabled roof. The building's roof is covered with metal factory panel. The building is utilitarian in design and features no exterior ornamentation.

The Security Building is an ancillary facility not associated with events that have made a significant contribution to the broad patterns of history. SEARCH recommends the resource is not significant under Criterion A. Background research indicates the resource lacks association

with any person(s) significant in history, and is recommended not significant under Criterion B. The resource's design is minimal, utilitarian, generally lacks architectural or engineering distinction and is recommended not significant under Criterion C. The resource is recommended not significant under Criterion D because it lacks the potential to yield further information of historical importance. SEARCH recommends the resource is not eligible for NRHP inclusion.

East Storage Building

The East Storage Building is a onestory ca. 1979 Industrial Vernacular-style warehouse located on the south side of Palisades Power Plant Road (Figure **16**). The prefabricated metal building rests on a concrete slab foundation with a rectangular plan. Bays enclosed by roll-down metal doors are located on the east, west, and north facades. An entrance enclosed by a solid metal door below a small wood portico is located on the south facade. The building's gabled roof is covered with metal factory panel. The building is utilitarian in design and



Figure 16. East Storage Building, facing southwest.

features no exterior ornamentation. The building's exterior is clad with nonhistoric replacement metal factory panel.

The East Storage Building is an ancillary facility not associated with events that have made a significant contribution to the broad patterns of history. SEARCH recommends the resource is not significant under Criterion A. Background research indicates the resource lacks association with any person(s) significant in history, and is recommended not significant under Criterion B. The resource's design is minimal, utilitarian, generally lacks architectural or engineering distinction and is recommended not significant under Criterion D because it lacks the potential to yield further information of historical importance. SEARCH recommends the resource is not eligible for NRHP inclusion.

East Radwaste Building

The East Radwaste Building is a 1979 Industrial one-story ca. Vernacular-style warehouse located north of the Switchyard on a paved access road (Figure 17). The building houses storage for radioactive waste. A ca. 1997 rear addition nearly doubled the building's footprint (NETR 1997). The building is located on a paved lot behind a perimeter fence. The prefabricated metal building rests on a concrete slab foundation with a rectangular plan. The building's gabled roof is covered with metal factory panel. Full height bays on the southwest and southeast



Figure 17. East Radwaste Building, facing east.

facades are enclosed by roll-down metal doors. A main entrance is centrally located on the southwest façade next to the full-height bay and is enclosed by a metal door with an upper light. The building is utilitarian in design and features no exterior ornamentation.

The East Radwaste Building is an ancillary facility not associated with events that have made a significant contribution to the broad patterns of history. SEARCH recommends the resource is not significant under Criterion A. Background research indicates the resource lacks association with any person(s) significant in history, and is recommended not significant under Criterion B. The resource's design is minimal, utilitarian, generally lacks architectural or engineering distinction and is recommended not significant under Criterion D because it lacks the potential to yield further information of historical importance. SEARCH recommends the resource is not eligible for NRHP inclusion.

Meteorological Tower

The ca. 1979 Meteorological Tower is located approximately 0.40 km (0.25 mi) east of the East Radwaste Building adjacent to the Blue Star Highway (**Figure 18**). The aluminum tower is located on hilly terrain within red oak, white ash, sassafras, and sugar maple forest (No Author 2005). The tower is 10 m (32.80 ft) in height and provides data such as wind speed, wind direction, and temperature. This data is used to determined atmospheric stability and atmospheric mixing heights (No Author 2005). The structure is utilitarian in design and features no exterior ornamentation.

The Meteorological Tower is an ancillary facility not associated with events that have made a significant contribution to the broad patterns of history. SEARCH recommends the resource is not significant under Criterion A. Background research indicates the resource lacks association with any person(s) significant in history, and is recommended not significant under Criterion B.



Figure 18. Meteorological Tower partially obstructed by topography from ROW, facing east.

The resource's design is minimal, utilitarian, generally lacks architectural or engineering distinction and is recommended not significant under Criterion C. The resource is recommended not significant under Criterion D because it lacks the potential to yield further information of historical importance. SEARCH recommends the resource is not eligible for NRHP inclusion.

Post-Tensioning Testing Structure

The ca. 1967 post-tensioning testing structure is located approximately 0.77 km (0.48 mi) north of the PNP building in a forested area offset west of Palisades Power Plant Road. The approximately 46.63 m (153.00 ft) semicircular concrete structure was built to test the tensioning system within the Containment Building prior to its construction (**Figure 19**). After its use for this purpose, it was abandoned in place.

The resource is a minor piece of constructionrelated infrastructure. The ancillary structure is not associated with events that have made a



Figure 19. Post-Tensioning Testing Structure, facing southwest.

significant contribution to the broad patterns of history. SEARCH recommends the resource is not significant under Criterion A. Background research indicates the resource lacks association

with any person(s) significant in history, and is recommended not significant under Criterion B. The resource's design is minimal, utilitarian, generally lacks architectural or engineering distinction and is recommended not significant under Criterion C. The resource is recommended not significant under Criterion D because it lacks the potential to yield further information of historical importance. SEARCH recommends the resource is not eligible for NRHP inclusion.

Chesapeake and Ohio Railroad Spur

The ca. 1967 Chesapeake and Ohio Railroad (C&O) Spur alignment formerly linked the PNP building with the C&O main line in southwest South Haven, Michigan (**Figure 20**). The resource is a minor spur track built to facilitate PNP construction between 1967 and 1971.

The C&O comprised approximately 150 smaller railroad lines incorporated between 1836 and the 1960s (C&O Historical Society 2024). The mainline is depicted as the Pere Marquette Railway east of the PNP plant on the earliest topographic quadrangle map of the area, 1927 *South Haven, MI* (USGS 1927). The C&O merged with the Pere Marquette Railway in 1947 (C&O Historical Society 2024). The track remained in place until at least 1981, as it is depicted on the 1981 *Covert, MI* USGS topographic quadrangle map (USGS 1981). Within the Survey Area, the spur measured approximately 1.51 km (0.94 mi) between the Blue Star Highway and the PNP's Auxiliary Building. An approximately 19.51 (64 ft) segment of track infilled with concrete remains east of the Auxiliary Building's main bay behind a perimeter fence. Survey did not identify extant track within the Survey Area along Palisades Power Plant Road or northeast of the East Radwaste Building. Outside the Survey Area, a segment of the former alignment has been replaced by the Van Buren Multi-Use Trail in Van Buren State Park.

The track represents a minor spur track built for PNP construction between 1967 and 1971. The resource is associated with the Containment Building's on-site construction and with the PNP's construction overall via regional transportation link. SEARCH recommends the resource is significant under Criterion A for this association. Background research indicates the resource lacks association with any person(s) significant in history, and is recommended not significant under Criterion B. The resource's design is minimal, utilitarian, generally lacks architectural or engineering distinction and is recommended not significant under Criterion C. The resource is recommended not significant under Criterion D because it lacks the potential to yield further information of historical importance.

Within the Survey Area, the resource has been either removed or over paved by Palisades Power Plant Road and the Palisades Access Road. An approximately 19.51 m (64 ft) segment of track infilled with concrete remains east of the Auxiliary Building. The segment represents the only remaining portion identified of the former 1.51 km (0.94 mi) within the Survey Area. The resource no longer retains its integrity of *location, design, workmanship* or *materials*. The resource remains within the Survey Area, routing adjacent to several buildings terminating just east of the PNP building, and retains its integrity of *setting*. The resource does not function as a freight spur track, and no longer retains its integrity of *feeling* or *association*. The resource no longer retains sufficient integrity to convey its significance. SEARCH recommends the resource is not eligible for NRHP inclusion.



Figure 20. Chesapeake and Ohio Railroad spur alignment replaced by Palisades Power Plant Road, facing east (left); Chesapeake and Ohio Railroad spur track terminating at Auxiliary Building, facing west (right).

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CONCLUSIONS AND RECOMMENDATIONS

SEARCH conducted intensive architectural history survey of the PNP Survey Area in Covert Township, Van Buren County, Michigan, on June 19, 2024. The Survey Area includes the entire PNP: an approximately 175 ha (432 ac) area bound by Lake Michigan to the west, Blue Star Highway to the east, Van Buren State Park to the north, and a private parcel to the south. SEARCH identified 14 historic-age resources in the Survey Area. Additionally, one resource, the PNP Building, consists of five interconnected facilities.

SEARCH recommends one newly recorded facility within the PNP Building, the ca. 1971 Containment Building, is individually eligible for NRHP inclusion for its significance under Criterion C. SEARCH recommends all other resources surveyed not eligible for NRHP inclusion. SEARCH also completed a Michigan SHPO Architectural District/Complex Identification Form for the PNP Complex and evaluated its NRHP eligibility as a whole. SEARCH recommends the PNP Complex is not eligible for NRHP inclusion as a historic district. No further architectural history work is recommended for the Survey Area. This page intentionally left blank.

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APPENDIX A

MICHIGAN INDIVIDUAL PROPERTY INVENTORY FORMS

Michigan SHPO Architectural District/Complex Identification Form



District Overview and Location

District/Complex Historic Name	Palisades Nuclear Plant Complex			
Current/Common Name	Palisades Nuclear Plant Complex			
Roughly bounded by streets	Lake Michigan (west), Blue Star Highway (east), Van Buren State Park (north), private parcel (south)			
City, State, Zip Code(s)	Covert, MI 49043			
County	Van Buren			
Total Acres in the District	ne District approximately 432 ac			
Ownership Private	Public-Local Public-State Public-Federal			

District/Complex Type

Commercial	Rural/Farm Complex
Residential	Other
Industrial 🛛	

District/Complex Information

Total Number of Resources	13			
Contributing Resources	N/A			
Non-Contributing Resources	N/A			
Significant Dates	ca. 1967-1979			
For complexes provide a list of resources:				
Palisades Nuclear Plant Building, Tank, Feedwater Purity Building, Discharge Structure, Cooling Tower Pump House, South Radwaste Building, Substation, Security Building, East Storage				

Substation, Security Building, East Storage Building, East Radwaste Building, Meteorological Tower, Post-Tensioning Testing Structure, Chesapeake and Ohio Railroad Spur.



National Register Eligibility

Is the district listed in	Yes 🗌 No) 🛛 If yes,	Date Listed:	NRIS #:
the National Register?		provide:		
	If not a	Iready listed, complet	e the information be	elow:
Eligible Under: Crite	erion A	Criterion B	Criterion C	Criterion D
Criteria Considerations:		a. 🗌 b. 🗌 c. 🗌] d. 🗌 e. 🗌 f.	g. 🗌
Not Eligible				
Area(s) of Significance	N/A			
Period(s) Significance N/A				
Integrity – Does the district/complex possess integrity in all or some of the 7 aspects?				
General Integrity: Intact Altered Moved Date(s): Various				
Location 🗌 Design 🗌	Materials	Workmanship	Setting 🗌 Fe	eling Association
Condition of District? Good 🛛 Fair 🗌 Poor 🗌				
Threats to Resource?	None			
Survey Date 6/19/202	24	Recorded By	Angelique Theriot	

For SHPO Use Only	SHPO Concurrence?: Y / N	Date:
Form date: 6/25/2019		

Narrative District/Complex Description

Provide a detailed description of the district/complex, including general character of the district/complex, types of buildings and structures including outbuildings and bridges, and the qualities distinguishing the district/complex from its surroundings. <u>This is required for all districts/complexes</u>.

The Palisades Nuclear Plant Complex includes 13 ca. 1967-1979 buildings and structures on an approximately 175-ha (432-ac) parcel, and includes the PNP building and its supporting facilities. The earliest topographic quadrangle map of the area, 1927 *South Haven, MI.*, depicts the PNP Complex within an undeveloped coastal area defined by low topography north of Palisades Park (USGS 1927). The PNP Complex is first depicted on 1981 *Covert, MI.*, though resources documented during survey date to ca. 1967-1979 (USGS 1981).

SEARCH identified 13 newly recorded historic age resources within the Survey Area. One of these newly recorded resources, the PNP Building, consists of five interconnected facilities. Buildings and structures within the PNP Complex possess Industrial Vernacular style elements or possess no architectural style. Industrial vernacular style is "used to describe buildings constructed to facilitate the needs of industry" (The Spruce 2022). Overall, the resources are utilitarian in design and possess little to no exterior ornamentation. The buildings were constructed to serve utilitarian purposes within the PNP complex.

History of the District/Complex

Provide information on previous owners, land use, construction and alteration dates in a narrative format. <u>This is required</u> for all intensive level surveys and recommended for other identification efforts.

The complex consist of resources constructed between ca. 1967 and ca. 1979. The Chesapeake and Ohio Railroad segment within the complex was built ca. 1967 to facilitate construction, and infilled with concrete at an undetermined date post-1981. The PNP Building consists of five ca. 1971-1979 facilities. By the 1980s the area north of the PNP building consists of several buildings or structures, though many have been demolished or replaced. The complex's historic cooling towers have also been replaced south of the PNP building. A large grouping of nonhistoric industrial buildings are located north of the East Radwaste building on Palisades Power Plant Road. Additional nonhistoric waste storage is also located north of that facility.

Statement of Significance/Recommendation of Eligibility

Provide a detailed explanation of the district/complex's eligibility for the National Register, including an evaluation under the four criteria, discussion of the seven aspects of integrity, and recommendations about eligibility. <u>This is required for all districts/complexes.</u>

The PNP Complex is not the first nuclear plant constructed in Michigan. The PNP Complex as a whole represents a mid-twentieth century nuclear plant with a PWR used for power generation. The complex is not associated with events that have made a significant contribution to the broad patterns of history and is recommended not significant under Criterion A. Background research indicates the complex lacks association with any person(s) significant in history and is recommended not significant under Criterion B. Resources within the plant are industrial in design and utilitarian in use. The PNP Building's Containment Building is recommended individually eligible for NRHP inclusion under Criterion C as the first post-tensioned concrete reactor building constructed within the US. However, the other resources surveyed within the PNP Complex were not built using this construction method and do not share this association. The other historic-age resources surveyed within the PNP Complex represent common mid-to-late twentieth century Industrial Vernacular buildings found at both nuclear plants and industrial locations broadly. Historic aerial photographs indicate construction expanded within the parcel throughout the 1980s and 1990s as necessary. Other facilities were demolished or replaced throughout the PNP's history of use. Purpose-built resources, such as the Chesapeake and Ohio Railroad Spur and the Post-Tensioning Testing Structure, were abandoned in place and permanently disused after fulfilling construction needs (NETR 1976, 1980, 1981, 1997). For these reasons, SEARCH determined the PNP Complex's development lacks a significant concentration of buildings and structures "unified historically or aesthetically by plan or physical development". (NPS 1997:5). The PNP Complex as a whole generally lacks architectural or engineering distinction, and is recommended not significant under Criterion C. The PNP Complex is recommended not significant under Criterion D because it lacks the potential to yield further information of historical importance. SEARCH recommends the PNP Complex is not eligible for NRHP inclusion as a historic district.

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List references used to research and evaluate the district/complex.

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District Inventory

Complete this form for the district as well as individual Michigan SHPO Architectural Resource Identification Form for each individual address.

STREET ADDRESS	CITY/TOWNSHIP	COUNTY	YEAR BUILT	CONTRIBUTING? (YES OR NO)
Palisades Nuclear Plant Building, 27780 Blue Star Highway, Covert MI 49043	Covert MI 49043	Van Buren	ca. 1971- 1979	N/A
Water Storage Tank, 27780 Blue Star Highway, Covert MI 49043	Covert MI 49043	Van Buren	ca. 1979	N/A
Feedwater Purity Building, 27780 Blue Star Highway, Covert MI 49043	Covert MI 49043	Van Buren	ca. 1979	N/A
Discharge Structure, 27780 Blue Star Highway, Covert MI 49043	Covert MI 49043	Van Buren	ca. 1968	N/A
Cooling Tower Pump House, 27780 Blue Star Highway, Covert MI 49043	Covert MI 49043	Van Buren	ca. 1968	N/A
South Radwaste Building, 27780 Blue Star Highway, Covert MI 49043	Covert MI 49043	Van Buren	ca. 1979	N/A
Switchyard, 27780 Blue Star Highway, Covert MI 49043	Covert MI 49043	Van Buren	ca. 1971	N/A
Security Building, 27780 Blue Star Highway, Covert MI 49043	Covert MI 49043	Van Buren	ca. 1979	N/A
East Storage Building, 27780 Blue Star Highway, Covert MI 49043	Covert MI 49043	Van Buren	ca. 1979	N/A
East Radwaste Building, 27780 Blue Star Highway, Covert MI 49043	Covert MI 49043	Van Buren	ca. 1979	N/A
Meteorological Tower, 27780 Blue Star Highway, Covert MI 49043	Covert MI 49043	Van Buren	ca. 1979	N/A
Containment Building Materials Testing Structure, 27780 Blue Star Highway, Covert MI 49043	Covert MI 49043	Van Buren	ca. 1967	N/A
Chesapeake and Ohio RR Spur, 27780 Blue Star Highway, Covert MI 49043	Covert MI 49043	Van Buren	ca. 1967	N/A

Exempted from Disclosure by Statute - Withheld Under 10 CFR 2.390(a)(3)



Turbine Building_a Facing S



Turbine Building_b Facing E



Turbine Building_c Facing NE



Turbine Building (right)_d Facing SW



Turbine Building_e Facing NE



Turbine Building_f Facing SW

Exempted from Disclosure by Statute - Withheld Under 10 CFR 2.390(a)(3)





Auxiliary Building (center)_a Facing NW

Exempted from Disclosure by Statute

Auxiliary Building (center)_b Facing NW



Service Building_a Facing N



Service Building_b Facing NW



Service Building (center)_c Facing SE



Service Building_d Facing E

Exempted from Disclosure by Statute - Withheld Under 10 CFR 2.390(a)(3)



Containment Building_b Facing N



Containment Building_d Facing NE



Containment Building_a Facing NW



Water Storage Tank (center left)_a Facing S



Water Storage Tank (center)_b Facing S



Feedwater Purity Building_a Facing S



Feedwater Purity Building_b Facing S



Feedwater Purity Building_c Facing E



Feedwater Purity Building_d Facing SW



Discharge Structure_a Facing N



Discharge Structure_b Facing N



Discharge Structure_c Facing NW



Discharge Structure_d Facing NE



Cooling Tower Pump House_a Facing SW



Cooling Tower Pump House_b Facing N



Cooling Tower Pump House_c Facing N



Cooling Tower Pump House_d Facing NW



Cooling Tower Pump House_e Facing SE


South Radwaste Building_a Facing SW



South Radwaste Building_b Facing SW



South Radwaste Building (left)_c Facing S...



South Radwaste Building_d Facing NE



Switchyard_a Facing E



Switchyard_b Facing SE



Switchyard_c Facing NE



Switchyard_d Facing NE



Security Building_a Facing NW



East Storage Building_a Facing W



East Storage Building_b Facing SE



East Storage Building_c Facing NW



East Storage Building_d Facing S



East Radwaste Building_a Facing NE



East Radwaste Building_b Facing N



East Radwaste Building_c Facing N



Meteorological Tower_a Facing W



Meteorological Tower_b Facing NW



Testing Structure_a Facing NE



Testing Structure_b Facing N



Testing Structure_c Facing NW



Testing Structure_d Facing SE



Chesapeake and Ohio Spur_c Facing SE



Chesapeake and Ohio Spur_a Facing NW



Chesapeake and Ohio Spur_b Facing E





Michigan SHPO Architectural Properties Identification Form

Property Overview and Location



Street Address	27780 Blue Star Hig	nway		
City/Township, State, Zip Code	Covert, MI 49043	Covert, MI 49043		
County	Van Buren			
Assessor's Parcel #	80-07-005-002-00			
Latitude/Longitude (to the 6th dec	cimal point) Lat: 42	2.322983°	Long: -86.314303°	
Ownership Private	Public-Local	Public-State	Public-Federal	Multiple

(Insert primary photograph below.)

Property Type

Building 🖾 select sub-type below	Structure
Commercial	
Residential	Object
Industrial 🖂	-
Other	

Architectural Information

Construction Date	Ca. 1971-1979
Architectural Style	Industrial Vernacular
Building Form	Irregular
Roof Form	Flat
Roof Materials	Concrete, Composite,
	Metal
Exterior Wall Materials	Metal
Foundation Materials	Concrete
Window Materials	N/A
Window Type	N/A
Outbuildings	Yes 🗌 No 🖾
Number/Type:	

Exempted from Disclosure by Statute

Eligibility

Individually Eligible	Criterion A		Criterion B		Criterion C	Crit	erion D	
Criteria Consider	ations:		a. 🗌 b. 🗌] c. [d.		g. 🗌	
Component of a Historic District	Contributin district	g to a	Non-contributo a district	uting	Historic District Na	me:	Palisades Nu Complex; Red NRHP eligible	clear Plant commended not
Not Eligible 🛛								
Area(s) of Signific	cance	N/A						
Period(s) of Sign	ificance	cance N/A						
Integrity – Does t	he property	oossess	integrity in all	or son	ne of the 7 aspects?)		
Location	Design	Mate	rials 🗌 W	orkmar	nship 🗌 Setting		Feeling	Association
General Integrity:		Intact Altered Moved Date(s):						
Historic Name		Palisades Nuclear Plant						
Current/Common	n Name	Palisades Nuclear Plant						
Historic/Original	Owner	Palisad	les Nuclear P	lant				
Historic Building	Use	Industrial						
Current Building	Use	Industrial						
Architect/Enginee	er/Designer	/Designer Unknown						
Builder/Contracto	or	Unknown						
Survey Date 6	6/19/2024	Rec	orded By	Angelio	que Theriot	Ag	gency Report #	

For SHPO Use Only SHPO Concurrence?: Y / N

Date:

Narrative Architectural Description

Provide a detailed description of the property, including all character defining features and any accessory resources.

The PNP Building is a ca. 1971-1979 Industrial Vernacular style building comprised of five interconnected historicage facilities with primary and auxiliary functions for electrical power generation. The 800-megawatt plant operated a single unit pressurized water reactor (PWR) between 1971 and its 2022 decommission. A CE 2LP (DRYAMB) Westinghouse turbine generator generates power at PNP when:

- 1. "The core inside the reactor vessel creates heat;
- 2. Pressurized water in the primary coolant loop carries the heat to the steam generator;
- 3. Inside the steam generator, heat from the primary coolant loop vaporizes the water in a secondary loop, producing steam; and
- 4. The steamline directs the steam to the main turbine, causing it to turn the turbine generator, which produces electricity" (NRC 2023).

The reactor houses fuel assemblies, or groups of fuel rods consisting of metal tubes containing fissionable material. It is cooled using water from Lake Michigan. This water is circulated by pumps within the Containment Building. The PNP has supplied 232.35 terawatt hours (TW.h) of electricity since 1971 (IAEA 2024). The PNP building covers approximately 2.31 ac (.93 ha), and its five interconnected historic-age facilities are described below. The facilities comprising the PNP building are Industrial Vernacular in style, utilitarian in design, and feature minimal exterior ornamentation. The Turbine Building, Administration Building, Auxiliary Building, and Service Building are described below. **The Containment Building is described in detail and evaluated for NRHP eligibility on a separate form.**

The **Turbine Building** is a ca. 1971 Industrial Vernacular "Design Class 3" facility attached to the Containment Building on its east façade. The Turbine Building houses the Auxiliary Feedwater Pump Room, Electrical Penetration Enclosure, main turbine generator, and other infrastructure (Garcia 2015). The Turbine Building is combined reinforced concrete and structural steel frame construction. Its exterior is clad with factory metal panel and its flat roof is covered with composite materials.

The **Administration Building** is a two-story ca. 1971 Industrial Vernacular style facility attached to the Auxiliary Building on its west façade. The building is clad with concrete and rests on a concrete slab foundation. The building's flat roof is covered by a concrete deck. Fenestration includes fixed-pane metal frame and casement windows on the east façade. The building is reinforced concrete construction. Full height pilasters below a deep overhang divide the east façade, and its upper story is clad with enameled metal panels. The building is clad with smooth concrete on the north and south facades. The main entrance is offset on the east façade and enclosed by double metal frame doors.

The **Auxiliary Building** is a ca. 1971 multi-story Industrial Vernacular style facility attached to the Administration Building on its east façade, and to the Containment Building on its south façade. The facility houses "the spent fuel pool, radioactive waste treatment facilities, engineered safeguards components, heating and ventilating system components, the emergency diesel generators, switchgear, laboratories, offices and the control room" (No Author 2005: 147). The facility is combined reinforced concrete and structural steel frame construction. Its exterior is clad with factory metal panel and its flat roof is covered with composite materials. The former ca. 1967 Chesapeake and Ohio Railroad Spur terminated at a central bay located behind a security fence on the facility's east façade. Subsequent additions are depicted on the building's northeast end by 1976 (NETR 1976; No Author 2005).

The **Service Building** is a ca. 1979 multi-story Industrial Vernacular style facility attached to the Auxiliary Building's north façade. The facility is combined reinforced concrete and structural steel frame construction. Its exterior is clad with factory metal panel and its flat roof is covered with composite materials. The facility's main entrance is located on the south end of the east façade within a vestibule accessed by an elevated catwalk. Fenestration consists of linear banks of square fixed pane metal frame windows separate by full-height pilaster-like metal panel. A ca. 1997 addition is located at the north end of the facility's west façade.

History of the Resource

Provide information on previous owners, land use, construction and alteration dates in a narrative format. This is required for all intensive level surveys and designation and recommended for other identification efforts.

The building also consists of a nonhistoric ca. 1997 service building addition on the Service Building's northwest facade (NETR 1997). A ca. 1997 addition is located at the north end of the Service Building's west facade. Construction on the site began in 1967, and PNP began operations on December 31, 1971.

Statement of Significance/Recommendation of Eligibility

Provide a detailed explanation of the property's eligibility for the National Register, including an evaluation under at least one of the four criteria, discussion of the seven aspects of integrity, and recommendations about eligibility. This is required for all properties.

The PNP Building consists of five interconnected historic-age facilities: the Containment Building, Turbine Building, Administration Building, Auxiliary Building and Service Building. The facilities are not associated with events that have made a significant contribution to the broad patterns of history, and are recommended not significant under Criterion A. Background research indicates the plant lacks association with any person(s) significant in history, and is recommended not significant under Criterion B. The Turbine Building, Administration Building, Auxiliary Buildings and Service buildings generally lack generally lack architectural or engineering distinction and are recommended not significant under Criterion C. The facilities are recommended not significant under Criterion D because they lack the potential to yield further information of historical importance.

The Containment Building is recorded on a separate form.

References

List references used to research and evaluate the individual property.

International Atomic Energy Agency (IAEA) "Palisades: Permanent Shutdown." Electronic document, 2022 https://pris.iaea.org/PRIS/CountryStatistics/ReactorDetails.aspx?current=616, accessed June 2024. Nationwide Environmental Title Research (NETR) Online 1976 Aerial Imagery of the PNP, Covert Township, MI. Electronic document, https://historicaerials.com/viewer, accessed June 2024. 1980 Aerial Imagery of the PNP, Covert Township, MI. Electronic document, https://historicaerials.com/viewer, accessed June 2024. 1997 Aerial Imagery of the PNP, Covert Township, MI. Electronic document, https://historicaerials.com/viewer, accessed June 2024. No Author 2005 "Applicant's Environmental Report: Operating License Nuclear Plant. Palisades Nuclear Plant. Nuclear Management Company. Docket No. 50-255. License No. DPR-20". US Nuclear Regulatory Commission (NRC) n.d. FSAR Chapter 2: Site and Environment. Electronic document, https://www.nrc.gov/docs/ML1915/ML19154A248.pdf, accessed June 2024. 2023 "Pressurized Water Reactors." Electronic document, https://www.nrc.gov/reactors/power/pwrs.html accessed June 2024.



Containment Building_b Facing N



Containment Building_c Facing W



Containment Building_d Facing NE



Containment Building_a Facing NW



Turbine Building_a Facing S



Turbine Building_b Facing E



Turbine Building_c Facing NE



Turbine Building (right)_d Facing SW



Turbine Building_e Facing NE



Turbine Building_f Facing SW

Exempted from Disclosure by Statute - Withheld Under 10 CFR 2.390(a)(3)







Auxiliary Building (center)_b Facing NW



Service Building_a Facing N



Service Building_b Facing NW



Service Building (center)_c Facing SE



Service Building_d Facing E







Michigan SHPO Architectural Properties Identification Form

Property Overview and Location



Street Address	27780 Blue Star Hig	27780 Blue Star Highway		
City/Township, State, Zip Code	Covert, MI 49043			
County	Van Buren			
Assessor's Parcel #	80-07-005-002-00			
Latitude/Longitude (to the 6th dec	cimal point) Lat: 42	2.322983°	Long: -86.314303°	
Ownership Private 🛛	Public-Local	Public-State	Public-Federal	Multiple

Property Type

Building 🖾 select sub-type below	Structure
Commercial	
Residential	Object
Industrial 🖂	-

(Insert primary photograph below.)

Architectural Information

Construction Date	Ca. 1971
Architectural Style	Industrial Vernacular
Building Form	Cylindrical
Roof Form	Domed
Roof Materials	Concrete, Metal
Exterior Wall Materials	Post-Tensioned
	Concrete
Foundation Materials	Concrete
Window Materials	N/A
Window Type	N/A
Outbuildings	Yes 🗌 🛛 No 🖾
Number/Type:	

Exempted from Disclosure by Statute

Eligibility

Individually Eligible	Criterion A		Criterion B	Criterion C	Criterion D	
Criteria Consider	ations:		a. 🗌 b. 🗌 c.	d e f.	g	
Component of a Historic District	Contributin district	g to a	Non-contributing to a district	Historic District Na	ne: Palisades Nuclear Plant Complex; Recommended NRHP eligible	not
Not Eligible						
Area(s) of Signifi	cance	Archite	cture, Engineering			
Period(s) of Sign	ificance	ca. 197	71			
Integrity – Does t	the property	oossess	integrity in all or s	ome of the 7 aspects?		
Location	Design 🛛	Mate	erials 🛛 🛛 Workm	anship 🛛 Setting	🖾 Feeling 🖾 Association	n 🛛
General Integrity	:	Intact Altered Moved Date(s):				
Historic Name		Contai	nment Building			
Current/Commor	n Name	Contai	nment Building			
Historic/Original	Owner	Palisad	des Nuclear Plant			
Historic Building	Use	Industrial				
Current Building	Use	Industrial				
Architect/Enginee	er/Designer	Unkno	wn			
Builder/Contracto	or	Unkno	wn			
Survey Date	6/19/2024	Rec	orded By Ange	lique Theriot	Agency Report #	

For SHPO Use Only SHPO Concurrence?: Y / N

Date:

Form date: 6/25/2019

Narrative Architectural Description

Provide a detailed description of the property, including all character defining features and any accessory resources.

The PNP Building is a ca. 1971-1979 Industrial Vernacular style building comprised of five interconnected historicage facilities with primary and auxiliary functions for electrical power generation. The **Containment Building** is a ca. 1971 multi-level Industrial Vernacular style building providing nuclear containment at PNP. The building has a cylindrical plan and is covered by a low pitched dome roof. The building "houses the nuclear steam supply system (NSSS), including the reactor, steam generators, primary coolants pumps and motors, pressurizer and quench tank...reactor auxiliaries, hydrogen recombiners, and containment building air coolers" (No Author 2005: 146).

Previous documentation indicates "the inside diameter is 116 ft; the inside height is 189 ft. The containment walls are 3.5 ft thick, the dome is 3 ft thick, and the base slab varies in thickness between 8 ft and 13 ft...The containment building was the first in the US to be post-tensioned, in both directions, with fully prestressed walls and dome" (Liaw and Tsai 1981: 2). The building's interior is concrete lined with .25 in carbon steel plates. The Containment Building's post-tension system includes:

- "Three groups of 55 dome tensions oriented at 120 degrees to each other for a total of 165 tendons anchored at the vertical face of the dome ring girder;
- 180 vertical tendons anchored at the top surface of the ring girder and at the bottom of the base slab;
- Six groups of 87 hoop tendons enclosing 120 degree of arc for a total of 522 tendons anchored at the six vertical buttresses" (Liaw and Tsai 1981: 2).

History of the Resource

Provide information on previous owners, land use, construction and alteration dates in a narrative format. <u>This is required</u> for all intensive level surveys and designation and recommended for other identification efforts.

Containment structures played a critical role in US nuclear facility construction, as safety was considered paramount in the development of nuclear power. Considerations about the need for containing nuclear materials in the event of reactor failure date to the earliest organized AEC activities. In 1947, the AEC organized the Reactor Safeguards Committee, later known as the Advisory Committee on Reactor Safeguards (ACRS) (NRC 2020). At its first meeting that year, the committee discussed the role containment structures needed to play and considered them critical to the protection of locals living near these sites (Tanguy 1988).

From the outset of US nuclear power plant construction, concrete served as the primary building material for containment structures to prevent radioactive material release in the event of failure. Researchers introduced the use of post-tensioned concrete to increase the strength and durability of concrete containment structures. Using steel-reinforced concrete, these systems use high-strength steel tendons in wire, strand, or bar form, which are "installed, tensioned, and then anchored to the hardened concrete ... to apply compressive forces to the concrete to provide increased resistance to concrete cracking" (Naus 2007:12-13). Post-tensioning provides an active system, with the anchored tendons strengthening the already reinforced concrete structure. Tendons are anchored by conduits or ducts within the containment structure and can then be post-tensioned for one or both ends. Once the tendons are in place, buttonheads, wedges, or nuts can be used as anchors, which are then protected from corrosion through bonded (cement grout) or unbonded (grease) methods (Naus et al. 1992:4).

The PNP's Containment Building was the first concrete containment building constructed for a nuclear facility that was "post-tensioned, in both directions, with fully prestressed walls and dome" (Liaw et al. 1981:2). Following the Palisades project, newly constructed nuclear facilities frequently used post-tensioned concrete containment structures. Though this did not become a standard practice for all new nuclear sites, post-tensioned concrete structures came to represent the "single largest class of containment structures," with 37 of the 100 operational sites nuclear sites using this type of facility in 2014 (Jones et al. 2015:1-1).

Statement of Significance/Recommendation of Eligibility

Provide a detailed explanation of the property's eligibility for the National Register, including an evaluation under at least one of the four criteria, discussion of the seven aspects of integrity, and recommendations about eligibility. <u>This is required for all properties</u>.

The Containment Building is not associated with events that have made a significant contribution to the broad patterns of history, and is recommended not significant under Criterion A. Background research indicates the Containment Building lacks association with any person(s) significant in history, and is recommended not significant under Criterion B. The Containment Building was the first post-tensioned concrete reactor building constructed within the US. Currently, post-tensioned concrete construction containment structures represent the most common type of containment structures found at US nuclear plants. SEARCH recommends the Containment Building is significant under Criterion C for this association. The Containment Building lacks the potential to yield further information of historical importance and is recommended not significant under Criterion D.

The Containment Building is located within its original footprint as an interconnected facility within the PNP Building and retains integrity of *location* and *setting*. The facility's post-tensioned concrete construction remains intact and retains integrity of *design*, *workmanship*, and *materials*. The facility retains its integrity of *feeling* and *association* as an integral part of PNP's past nuclear generating operations within the PNP Building footprint. The facility retains sufficient integrity to convey its significance under Criterion C (Architecture/Engineering). SEARCH recommends the Containment Building is eligible for NRHP inclusion.

References

List references used to research and evaluate the individual property.

Jones, Christopher A., Lili A.A. Heitman, and Robert Dameron

2015 *Study on Post Tensioning Methods*. Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, DC.

Liaw, C.Y. and N.C. Tsai

1981 "Structural Review of the Palisades Nuclear Power Plant Unit 1 Containment Structure Under Combined Loads for the Systemic Evaluation Program." Prepared for Office of Nuclear Reactor Regulation.

Naus, Dan J., C. Barry Oland, Bruce Ellingwood, Yasuhiro Mori, and E. Gunter Arndt

1992 Aging of Concrete Containment Structures in Nuclear Power Plants. Oak Ridge National Laboratory. Research sponsored by the Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, DC.

No Author

2005 "Applicant's Environmental Report: Operating License Nuclear Plant. Palisades Nuclear Plant. Nuclear Management Company. Docket No. 50-255. License No. DPR-20".

Tanguy, Pierre

1988 *Three decades of nuclear safety.* Special report: Nuclear plant safety. International Atomic Energy Agency. Vienna, Austria.

US Nuclear Regulatory Commission (NRC)

2020 ACRS History. Electronic document, https://www.nrc.gov/about-nrc/regulatory/advisory/ acrs/history.html, accessed June 2024.



Containment Building_b Facing N





Containment Building_d Facing NE



Containment Building_a Facing NW







Michigan SHPO Architectural Properties Identification Form Property Overview and Location



Street Address	27780 Blue Star Hig	7780 Blue Star Highway		
City/Township, State, Zip Code	Covert, MI 49043	Covert, MI 49043		
County	Van Buren			
Assessor's Parcel #	80-07-005-002-00			
Latitude/Longitude (to the 6th dec	cimal point) Lat: 4	2.323931°	Long: -86.313918°	
Ownership Private 🛛	Public-Local	Public-State	Public-Federal	Multiple

Property Type

Building Select sub-type below	Structure
Commercial	
Residential	Object
Industrial 🗌	
Other	

Architectural Information

Construction Date	Ca. 1979
Architectural Style	No Style
Building Form	Cylindrical
Roof Form	Dome
Roof Materials	Metal
Exterior Wall Materials	Metal
Foundation Materials	Concrete
Window Materials	n/a
Window Type	n/a
Outbuildings	Yes 🗌 🛛 No 🖾
Number/Type:	



Eligibility

	-								
Individually	Criterion A		Criterion B		Criterion C		Criterion D		
Eligible									
Criteria Considerations:			a. 🗌 b. [c. [] d. 🗌 e	e. 🗌 f. [g. 🛄		
Component of a	Contributin	Contributing to a		Non-contributing		Historic District Name:		Palisades Nuclear Plant	
Historic District	district	district					Complex	Complex; Recommended not	
						NRHP el	NRHP eligible		
Not Eligible									
	(°	. / .							
Area(s) of Significance n/a		n/a	<u>ገ/a</u>						
Period(s) of Significance n/a			a						
Integrity – Does the property possess integrity in all or some of the 7 aspects?									
Location Design Mate		terials 🔲 Workmanship 🔲 Setting 🗌 Feeling 🔲 Association 🗌				Association			
General Integrity:		Intact Altered Moved Date(s):							
Historic Name V		Water Storage Tank							
Current/Common Name		Water Storage Tank							
Historic/Original Owner Pa		Palisa	Palisades Nuclear Plant						
Historic Building Use Sto		Storag	Storage						
Current Building Use Stor		Storag	Storage						
Architect/Engineer/Designer Unkr		Unkno	Unknown						
Builder/Contractor Unk		Unkno	Jnknown						
Survey Date	6/19/2024	Red	corded By	Angeli	que Theriot		Agency Rep	oort #	

For SHPO Use Only	SHPO Concurrence?: Y / N	Date:

Narrative Architectural Description

Provide a detailed description of the property, including all character defining features and any accessory resources.

The ca. 1979 water storage tank located on the north side of the Service Building addition is cylindrical, galvanized style construction and rests on a concrete slab foundation. The structure is utilitarian in design and features no exterior ornamentation

History of the Resource

Provide information on previous owners, land use, construction and alteration dates in a narrative format. <u>This is required</u> for all intensive level surveys and designation and recommended for other identification efforts.

The resource is an ancillary feature within the Palisades Nuclear Plant property. The building was constructed ca. 1979 for a support function. The structure does not appear altered or moved.

Statement of Significance/Recommendation of Eligibility

Provide a detailed explanation of the property's eligibility for the National Register, including an evaluation under at least one of the four criteria, discussion of the seven aspects of integrity, and recommendations about eligibility. <u>This is required</u> for all properties.

The water storage tank is an ancillary structure and is not associated with events that have made a significant contribution to the broad patterns of history. SEARCH recommends the resource is not significant under Criterion A. Background research indicates the resource lacks association with any person(s) significant in history, and is recommended not significant under Criterion B. The resource's design is minimal, utilitarian, generally lacks architectural or engineering distinction and is recommended not significant under Criterion D because it lacks the potential to yield further information of historical importance. SEARCH recommends the resource is not eligible for NRHP inclusion.

References

List references used to research and evaluate the individual property.

Nationwide Environmental Title Research (NETR) Online

1976	Aerial Imagery of the PNP, Covert Township, MI. Electronic document, https://historicaerials.com/viewer, accessed
	June 2024.

No Author

2005 "Applicant's Environmental Report: Operating License Nuclear Plant. Palisades Nuclear Plant. Nuclear Management Company. Docket No. 50-255. License No. DPR-20".



Water Storage Tank (center left)_a Facing S



Water Storage Tank (center)_b Facing S






Street Address	27780 Blue Star	Highway	
City/Township, State, Zip Code	Covert, MI		
County	Van Buren		
Assessor's Parcel #	80-07-005-002-00		
Latitude/Longitude (to the 6th dec	cimal point) La	t: 42.323835°	Long: -86.314403°
Ownership Private 🛛	Public-Local	Public-State	Public-Federal 🗌 Multiple 🗌

Property Type

Building 🖾 select sub-type below	Structure
Commercial	
Residential	Object
Industrial 🖂	-
Other	

Architectural Information

Construction Date	Ca. 1979
Architectural Style	Industrial Vernacular
-	
Building Form	Rectangular
Roof Form	Flat
Roof Materials	Composite/Concrete
Exterior Wall Materials	Metal Factory Panel
Foundation Materials	Concrete
Window Materials	N/A
Window Type	N/A
Outbuildings	Yes 🗌 🛛 No 🖂
Number/Type:	



Individually Eligible	Criterion A		Criterion B		Criterion C		Criterion D]
Criteria Conside	erations:		a. 🗌 b. [C.		. 🗌 f. 🗌] g. []	
Component of a	a Contributin	g to a	Non-contri	outing	Historic Dis	trict Name	e: Palisades	Nuclear Plant
Historic District	district	-	to a district				Complex;	Recommended not
							NRHP elig	ible
Not Eligible 🖂								
Area(s) of Signi	ficance	N/A			·			
Period(s) of Sig	nificance	N/A						
Integrity – Does the property possess integrity in all or some of the 7 aspects?								
Location	Design	Mate	erials 🗌 🛝	Norkma	nship 🗌 🗄	Setting [Feeling	Association
General Integrit	y:	Intact D	\triangleleft	Altered		Moved	1	Date(s):
Historic Name		Feedw	ater Purity B	uilding				
Current/Commo	on Name	Feedwater Purity Building						
Historic/Origina	l Owner	Palisa	des Nuclear	Plant				
Historic Building	g Use	Palisad	des Nuclear	Plant				
Current Building	g Use	Industrial						
Architect/Engin	eer/Designer	er Unknown						
Builder/Contrac	tor	Unknown						
Survey Date	6/19/2024	Rec	corded By	Angeli	que Theriot		Agency Repo	rt #

For SHPO Use Only SHPO Concurrence?: Y / N	Date:
--	-------

Provide a detailed description of the property, including all character defining features and any accessory resources.

The Feedwater Purity Building is a ca. 1979 multi-story Industrial Vernacular style building located northwest of the Service Building addition. The building is alternately referred to as the "Condensate and Makeup Demineralizer Building". The building houses the "raw water filtration system, the reverse osmosis pretreatment system, the makeup demineralizer system, regeneration chemicals handling system, feedwater purity air compressors, and related facilities" (No Author 2005: 147). The facility combines reinforced concrete and steel construction. Its exterior is clad with factory metal panel and its flat roof supports a concrete deck behind a low parapet. Fenestration includes louvered vents located along the building's upper story. A loading dock area on the northwest façade consists of a wide loading bay above a concrete ramp enclosed by a sliding single track door, a loading bay above a recessed ramp enclosed by a roll-down garage door, and a cushion dock shelter above a concrete ramp. A small addition with a loading bay is located on northwest façade's east end. The building rests on an elevated concrete foundation. The building's northwest façade is enclosed by a security perimeter fence. Prefabricated metal observation booths are located on the building's flat roof at the northeast and southwest corners. The building is utilitarian in design and features no exterior ornamentation.

History of the Resource

Provide information on previous owners, land use, construction and alteration dates in a narrative format. <u>This is required</u> for all intensive level surveys and designation and recommended for other identification efforts.

The building was constructed ca. 1979 as an ancillary building within the Palisades Nuclear Plant property. The building does not appear to have been altered or moved since its construction.

Statement of Significance/Recommendation of Eligibility

Provide a detailed explanation of the property's eligibility for the National Register, including an evaluation under at least one of the four criteria, discussion of the seven aspects of integrity, and recommendations about eligibility. <u>This is required</u> for all properties.

The feedwater purity building is an ancillary building and is not associated with events that have made a significant contribution to the broad patterns of history. SEARCH recommends the structure is not significant under Criterion A. Background research indicates the resource lacks association with any person(s) significant in history, and is recommended not significant under Criterion B. The resource's design is minimal, utilitarian, generally lacks architectural or engineering distinction and is recommended not significant under Criterion D because it lacks the potential to yield further information of historical importance. SEARCH recommends the resource is not eligible for NRHP inclusion.

References

List references used to research and evaluate the individual property.

Nationwide Environmental Title Research (NETR) Online

1976 Aerial Imagery of the PNP, Covert Township, MI. Electronic document, https://historicaerials.com/viewer, accessed June 2024.

1980 Aerial Imagery of the PNP, Covert Township, MI. Electronic document, https://historicaerials.com/viewer, accessed June 2024.

No Author

2005 "Applicant's Environmental Report: Operating License Nuclear Plant. Palisades Nuclear Plant. Nuclear Management Company. Docket No. 50-255. License No. DPR-20".



Feedwater Purity Building_a Facing S



Feedwater Purity Building_b Facing S



Feedwater Purity Building_c Facing E



Feedwater Purity Building_d Facing SW







Street Address	27780 Blue Star Hi	ghway		
City/Township, State, Zip Code	Covert, MI 49043			
County	Van Buren			
Assessor's Parcel #	80-07-005-002-00			
Latitude/Longitude (to the 6th dec	cimal point) Lat: 4	42.323337°	Long: -86.315563°	
Ownership Private 🛛	Public-Local	Public-State	Public-Federal	Multiple

(Insert primary photograph below.)

Property Type

Building Select sub-type below	Structure
Commercial	
Residential	Object
Industrial 🗌	-
Other	

Architectural Information

Construction Date	ca. 1968
Architectural Style	No Style
Building Form	Irregular
Roof Form	N/A
Roof Materials	N/A
Exterior Wall Materials	Metal; Concrete
Foundation Materials	Metal; Concrete
Window Materials	N/A
Window Type	N/A
Outbuildings	Yes 🗌 🛛 No 🖂
Number/Type:	

Eligibility

Individually Eligible	Criterion A		Criterion B	Criterion C	Crit	terion D	
Criteria Consider	ations:		a. 🗌 b. 🗌 c.	d e	f. 🗌	g. 🗌	
Component of a Historic District	Contributin district	g to a	Non-contributing to a district	Historic District	Name:	Palisades Nucle Complex; Reco NRHP eligible	ear Plant mmended not
Not Eligible 🛛							
Area(s) of Signifi	cance	N/A					
Period(s) of Sign	ificance	N/A					
Integrity – Does the property possess integrity in all or some of the 7 aspects?							
Location	Design 🗌	Mate	erials 🗌 Workm	anship 🗌 Sett	ting 🗌	Feeling	Association
General Integrity		Intact D	Altere	d 🗌	Moved] Date(s):
Historic Name		Discha	rge Structure				
Current/Common	n Name	Discha	rge Structure				
Historic/Original	Owner	Palisad	des Nuclear Plant				
Historic Building	Use	Industr	ial				
Current Building	Use	Industrial					
Architect/Enginee	chitect/Engineer/Designer Unknown						
Builder/Contracto	or	Unkno	wn				
Survey Date	6/19/2024	Rec	corded By Ange	lique Theriot	A	gency Report #	

For SHPO Use Only	SHPO Concurrence?: Y / N	Date:

Provide a detailed description of the property, including all character defining features and any accessory resources.

The ca. 1968 Discharge Structure is located west of the Cooling Tower Pump House on Lake Michigan. The structure releases wastewater into Lake Michigan. The structure consists of steel interlocking driven sheet piles supporting an encircling concrete platform. Water intake occurs "from a depth of about 20 ft, 3,500 feet offshore, raising its temperature as it is used for service water and dilution of cooling tower blowdown" (NRC n.d.:11). The pilings enclose the structure's makeup basin and mixing basin. The structure is enclosed by various secured chain link perimeter fences. The structure possesses no style, is utilitarian in design, and features no exterior ornamentation.

History of the Resource

Provide information on previous owners, land use, construction and alteration dates in a narrative format. <u>This is required</u> for all intensive level surveys and designation and recommended for other identification efforts.

The resource is an ancillary feature within the Palisades Nuclear Plant property. The structure was built ca. 1968 for a support function. The structure does not appear altered or moved.

Statement of Significance/Recommendation of Eligibility

Provide a detailed explanation of the property's eligibility for the National Register, including an evaluation under at least one of the four criteria, discussion of the seven aspects of integrity, and recommendations about eligibility. <u>This is required</u> for all properties.

The discharge structure is an ancillary structure not associated with events that have made a significant contribution to the broad patterns of history. SEARCH recommends the structure is not significant under Criterion A. Background research indicates the resource lacks association with any person(s) significant in history, and is recommended not significant under Criterion B. The resource's design is minimal, utilitarian, generally lacks architectural or engineering distinction and is recommended not significant under Criterion D because it lacks the potential to yield further information of historical importance. SEARCH recommends the resource is not eligible for NRHP inclusion.

References

List references used to research and evaluate the individual property.

Nationwide Environmental Title Research (NETR) Online

1976 Aerial Imagery of the PNP, Covert Township, MI. Electronic document, https://historicaerials.com/viewer, accessed June 2024.

US Nuclear Regulatory Commission (NRC)

n.d. FSAR Chapter 2: Site and Environment. Electronic document,

https://www.nrc.gov/docs/ML1915/ML19154A248.pdf, accessed June 2024.



Discharge Structure_a Facing N



Discharge Structure_b Facing N



Discharge Structure_c Facing NW



Discharge Structure_d Facing NE







				1.1
Street Address	27780 Blue Star H	lighway		
City/Township, State, Zip Code	Covert, MI 49043			
County	Van Buren			
Assessor's Parcel #	80-07-005-002-00			
Latitude/Longitude (to the 6 th dec	cimal point) Lat	42.323208°	Long: -86.315119°	
Ownership Private 🛛	Public-Local	Public-State	Public-Federal 🗌 Multiple 🗌	

Property Type

Building 🛛 select sub-type below	Structure
Commercial	
Residential	Object
Industrial 🖂	
Other	

Architectural Information

Construction Date	Ca. 1968
Architectural Style	Industrial Vernacular
Building Form	Rectangular
Roof Form	Flat
Roof Materials	Concrete
Exterior Wall Materials	Metal
Foundation Materials	Concrete
Window Materials	Metal
Window Type	Louvered Vents
Outbuildings	Yes 🗌 🛛 No 🖂
Number/Type:	



Individually Eligible	Criterion A		Criterion B		Criterion C	Crit	erion D		
Criteria Conside	rations:		a. 🗌 b. [C. [d. 🔄 e. 🗌] f. 🗌	g. 🗌		
Component of a Historic District	Contributing to a district		Non-contril to a district	outing	Historic District Name:		Palisades Nuclear Plant Complex; Recommended not NRHP eligible		
Not Eligible									
Area(s) of Signif	icance	N/A							
Period(s) of Sigr	nificance	N/A							
Integrity – Does	the property	possess	integrity in a	all or sor	ne of the 7 aspe	cts?			
Location	Design 🗌	Mate	erials 🔲 🛽	<u>Vorkma</u>	nship 🔲 Set	tting 🗌	Feeling	Association	
General Integrity	General Integrity: Intact			Altered Moved			Date	(s):	
Historic Name		Coolin	g Tower Pun	np Hous	е				
Current/Commo	n Name	Coolin	g Tower Pun	np Hous	е				
Historic/Original	Owner	Palisad	des Nuclear	Plant					
Historic Building	Use	Palisad	des Nuclear	Plant					
Current Building	Use	Industr	ial						
Architect/Engineer/Designer Unknown									
Builder/Contract	wn								
Survey Date	6/19/2024	Rec	orded By	Angeli	que Theriot	Ag	gency Report #		

For SHPO Use Only	SHPO Concurrence?: Y / N	Date:

Provide a detailed description of the property, including all character defining features and any accessory resources.

The cooling tower pump house is a multi-story ca. 1968 Industrial Vernacular style ancillary building centrally located northwest of the Turbine Building. The building "contains two vertical pumps to circulate the tube side condenser cooling water to the cooling towers for the Circulating Water System, a warm water recirculation pump to allow circulating warm discharge effluent back to the intake structure for the service water pumps during winter months, and a chemical addition system to combat biofouling in the Circulating Water System" (No Author 2005:147). The facility is combined reinforced concrete and steel frame construction. Its exterior is clad with factory metal panel and its flat roof supports multiple large industrial vent hoods. Fenestration consists of louvered vents on the upper story, and entrances on the south and east facades enclosed by solid metal doors. A utilitarian full height ladder attached to the south façade provides roof access. Intake or discharge ductwork is fixed to the building is utilitarian in design and features no exterior ornamentation. The cooling towers associated with this building south of the plant were replaced ca. 2014-2016.

History of the Resource

Provide information on previous owners, land use, construction and alteration dates in a narrative format. <u>This is required</u> for all intensive level surveys and designation and recommended for other identification efforts.

The resource is an ancillary feature within the Palisades Nuclear Plant property. The building was constructed ca. 1968 for a support function. The structure does not appear altered or moved.

Statement of Significance/Recommendation of Eligibility

Provide a detailed explanation of the property's eligibility for the National Register, including an evaluation under at least one of the four criteria, discussion of the seven aspects of integrity, and recommendations about eligibility. <u>This is required for all properties</u>.

The cooling tower pump house is an ancillary structure not associated with events that have made a significant contribution to the broad patterns of history. SEARCH recommends the structure is not significant under Criterion A. Background research indicates the resource lacks association with any person(s) significant in history, and is recommended not significant under Criterion B. The resource's design is minimal, utilitarian, generally lacks architectural or engineering distinction and is recommended not significant under Criterion D because it lacks the potential to yield further information of historical importance. SEARCH recommends the resource is not eligible for NRHP inclusion.

References

List references used to research and evaluate the individual property.

Nationwide Environmental Title Research (NETR) Online

- 1976 Aerial Imagery of the PNP, Covert Township, MI. Electronic document, https://historicaerials.com/viewer, accessed June 2024.
- US Nuclear Regulatory Commission (NRC)
- n.d. FSAR Chapter 2: Site and Environment. Electronic document,
 - https://www.nrc.gov/docs/ML1915/ML19154A248.pdf, accessed June 2024.



Cooling Tower Pump House_a Facing SW



Cooling Tower Pump House_b Facing N



Cooling Tower Pump House_c Facing N



Cooling Tower Pump House_d Facing NW



Cooling Tower Pump House_e Facing SE







Street Address	27780 Blue Star Hig	27780 Blue Star Highway						
City/Township, State, Zip Code	Covert, MI 49043							
County	Van Buren							
Assessor's Parcel #	80-07-005-002-00							
Latitude/Longitude (to the 6th dee	cimal point) Lat: 4	2.322039°	Long: -86.315449°					
Ownership Private	Public-Local	Public-State	Public-Federal	Multiple				

Property Type

Building 🖾 select sub-type below	Structure
Commercial	
Residential	Object
Industrial 🗌	-
Other	

Architectural Information

Ca. 1979						
Industrial Vernacular						
Rectangular						
Gabled						
Metal						
Metal						
Concrete						
Metal						
Louvered Vents						
Yes 🗌 No 🖂						



Individually Eligible	Criterion A		Criterion B		Criterion C [riterion D	
Criteria Conside	rations:		a. 🗌 b. [C. [d. 🔄e. [f. 🗌	g. 🗌	
Component of a	Contributin	g to a	Non-contri	outing	Historic District Name:		Palisades Nucl	ear Plant
Historic District	district	district					Complex; Reco	mmended not
Not Eligible								
Area(c) of Signi	licanco	NI/A						
Area(s) of Sign	aificanco	N/A						
Period(S) of Sign	the property		intogritulin		no of the 7 cone	a ata 2		
Integrity – Does	the property	possess						A
	Design	INIAte	eriais 🔄 🛝	/vorkma	nsnip 📋 Se	etting		Association
General Integrity	General Integrity: Intact			Altered		Moved	_ Date	(s):
Historic Name South			Radwaste B	uilding				
Current/Commo	n Name	South	Radwaste B	uilding				
Historic/Original	Owner	Palisad	des Nuclear	Plant				
Historic Building	Use	Industr	ial					
Current Building	Use	Industr	ial					
Architect/Engine	Architect/Engineer/Designer Unknown							
Builder/Contractor Unkno			wn					
Survey Date	6/19/2024	Rec	corded By	Angeli	que Theriot		Agency Report #	

For SHPO Use Only	SHPO Concurrence?: Y / N	Date:

Provide a detailed description of the property, including all character defining features and any accessory resources.

The south radwaste building is a single-story ca. 1979 Industrial Vernacular style warehouse located southwest of the Turbine Building. The building houses storage for radioactive waste. The small building rests on a concrete foundation and is prefabricated metal construction. The building is covered by a metal front gabled roof with low pitch. Fenestration consists of small louvered vents and a narrow bay above a low concrete ramp on the south façade. The bay is enclosed by a roll-down metal door. The building is utilitarian in design and features no exterior ornamentation.

History of the Resource

Provide information on previous owners, land use, construction and alteration dates in a narrative format. <u>This is required</u> for all intensive level surveys and designation and recommended for other identification efforts.

The resource is an ancillary feature within the Palisades Nuclear Plant property. The building was constructed ca. 1979 for a support function. The structure does not appear altered or moved.

Statement of Significance/Recommendation of Eligibility

Provide a detailed explanation of the property's eligibility for the National Register, including an evaluation under at least one of the four criteria, discussion of the seven aspects of integrity, and recommendations about eligibility. <u>This is required</u> for all properties.

The south radwaste building is an ancillary building not associated with events that have made a significant contribution to the broad patterns of history. SEARCH recommends the building is not significant under Criterion A. Background research indicates the resource lacks association with any person(s) significant in history, and is recommended not significant under Criterion B. The resource's design is minimal, utilitarian, generally lacks architectural or engineering distinction and is recommended not significant under Criterion C. The resource is recommended not significant under Criterion D because it lacks the potential to yield further information of historical importance. SEARCH recommends the resource is not eligible for NRHP inclusion.

References

List references used to research and evaluate the individual property.

Nationwide Environmental Title Research (NETR) Online

1976 Aerial Imagery of the PNP, Covert Township, MI. Electronic document, https://historicaerials.com/viewer, accessed June 2024.

Exempted from Disclosure by Statute - Withheld Under 10 CFR 2.390(a)(3)



South Radwaste Building_a Facing SW



South Radwaste Building_b Facing SW





South Radwaste Building_d Facing NE







Street Address	27780 Blue Star Hig	27780 Blue Star Highway						
City/Township, State, Zip Code	Covert, MI 49043							
County	Van Buren							
Assessor's Parcel #	80-07-005-002-00							
Latitude/Longitude (to the 6th dec	cimal point) Lat: 42	2.321237°	Long: -86.306487°					
Ownership Private	Public-Local	Public-State	Public-Federal	Multiple				

Property Type

Building Select sub-type below	Structure
Commercial	
Residential	Object
Industrial 🗌	-
Other	

Architectural Information

Construction Date	Ca. 1971
Architectural Style	No Style
Building Form	N/A
Roof Form	N/A
Roof Materials	N/A
Exterior Wall Materials	N/A
Foundation Materials	N/A
Window Materials	N/A
Window Type	N/A
Outbuildings	Yes 🛛 No 🗌
Number/Type:	1/Switchyard Control
	House



Individually Eligible	Criterion A		Criterion B		Criterion C		Crite	erion D]	
Criteria Conside	erations:		a. 🗌 b. [C. [de	e. 🗌 f.		g. 🗌		
Component of a	Contributin	g to a	Non-contril	outing	Historic District Name:		Palisades	Nucl	ear Plant	
Historic District	district	-	to a district					Complex;	Reco	mmended not
								NRHP elig	jible	
Not Eligible										
Area(s) of Signi	ficance	N/A								
Period(s) of Sig	nificance	N/A								
Integrity – Does	the property	possess	integrity in a	all or sor	ne of the 7 a	spects?				
Location	Design	Mate	erials 🗌 🛝	Norkma	nship 🗌	Setting		Feeling [Association
General Integrit	y:	Intact		Altered 🖂 Moved 🗌] Date(s):ca. 2016			
Historic Name		Switch	yard							
Current/Commo	on Name	Switch	yard							
Historic/Original	Owner	Palisad	des Nuclear	Plant						
Historic Building	j Use	Industi	rial							
Current Building	j Use	e Industrial								
Architect/Engineer/Designer Unknown										
Builder/Contrac	wn									
Survey Date	6/19/2024	Rec	corded By	Angeli	que Theriot		Ac	ency Repo	rt #	

For SHPO Use Only	SHPO Concurrence?: Y / N	Date:

Provide a detailed description of the property, including all character defining features and any accessory resources.

The ca. 1971 345 kV Switchyard is located approximately 0.57 km (0.36 mi) southeast of the PNP building. The switchyard is located on a paved access road south of Palisades Power Plant Road. The Switchyard is airinsulated, with powerlines suspended above the large outdoor space. The gantry structure configuration appears similar to its depiction on 1976 aerial photographs (NETR 1976). The Switchyard features a maintained gravel fill lot enclosed by an electrified perimeter fence. Security access restricted any survey within the perimeter fence. The facility is utilitarian in design and features no exterior ornamentation. A ca. 1971 one-story switchyard control house is located at the switchyard's west boundary. The building is concrete construction on a concrete slab foundation with rectangular plan. The building is covered by a flat concrete roof. Fenestration on the west façade consists of louvered vents and a metal door with small upper light. Its north and east facades are obscured from view from the Right of Way.

History of the Resource

Provide information on previous owners, land use, construction and alteration dates in a narrative format. <u>This is required</u> for all intensive level surveys and designation and recommended for other identification efforts.

The resource provides a link between PNP and the plant's transmission lines, serving to link the power produced there to the grid. Previous documentation indicates "power output from the Palisades main generator is fed to the transmission grid via an overhead circuit between the main transformer...and the Palisades Switchyard" (No Author 2005: 153). The switchyard is depicted on aerial photos in 1976 as approximately 5.47 ac (2.21 ha) in size. A ca. 2016 expansion increased the switchyard to approximately 7.30 ac (2.95 ha)(NETR 1976, 2016).

Statement of Significance/Recommendation of Eligibility

Provide a detailed explanation of the property's eligibility for the National Register, including an evaluation under at least one of the four criteria, discussion of the seven aspects of integrity, and recommendations about eligibility. <u>This is required for all properties</u>.

The switchyard is an ancillary facility not associated with events that have made a significant contribution to the broad patterns of history. SEARCH recommends the building is not significant under Criterion A. Background research indicates the resource lacks association with any person(s) significant in history, and is recommended not significant under Criterion B. The resource's design is minimal, utilitarian, generally lacks architectural or engineering distinction and is recommended not significant under Criterion D because it lacks the potential to yield further information of historical importance. SEARCH recommends the resource is not eligible for NRHP inclusion.

References

List references used to research and evaluate the individual property.

Nationwide Environmental Title Research (NETR) Online

- 1976 Aerial Imagery of the PNP, Covert Township, MI. Electronic document, https://historicaerials.com/viewer, accessed June 2024.
- 2016 Aerial Imagery of the PNP, Covert Township, MI. Electronic document, https://historicaerials.com/viewer, accessed June 2024.

US Nuclear Regulatory Commission (NRC)

n.d. FSAR Chapter 2: Site and Environment. Electronic document, https://www.nrc.gov/docs/ML1915/ML19154A248.pdf, accessed June 2024.



Switchyard_a Facing E



Switchyard_b Facing SE



Switchyard_c Facing NE



Switchyard_d Facing NE







Street Address	27780 Blue Star Hig	hway		
City/Township, State, Zip Code	Covert, MI 49043			
County	Van Buren			
Assessor's Parcel #	80-07-005-002-00			
Latitude/Longitude (to the 6th dec	cimal point) Lat: 4	2.323029°	Long: -86.313129°	
Ownership Private 🛛	Public-Local	Public-State	Public-Federal	Multiple

Property Type

Building 🖾 select sub-type below	Structure
Commercial	
Residential	Object
Industrial 🖂	
Other	

Architectural Information

Construction Date	Ca. 1979		
Architectural Style	Industrial Vernacular		
Building Form	Irregular		
Roof Form	Gable		
Roof Materials	Metal		
Exterior Wall Materials	Metal		
Foundation Materials	Concrete		
Window Materials	N/A		
Window Type	N/A		
Outbuildings	Yes 🗌 🛛 No 🖂		
Number/Type:			



Individually Eligible	Criterion A		Criterion B		Criterion C	Criterion D
Criteria Considerations:		a. 🗌 b. 🗌	c. [d. 🗌 e. 🗌 f.	g	
Component of a	nponent of a Contributing to a		Non-contrib	uting	Historic District Nan	ne: Palisades Nuclear Plant
Historic District	district		to a district			Complex; Recommended not NRHP eligible
Not Eligible						
Area(s) of Significance N/A						
Period(s) of Significance N/A						
Integrity – Does the property possess integrity in all or some of the 7 aspects?						
Location	Design 🗌	Mate	erials 🗌 V	/orkma	nship 🗌 Setting	Feeling Association
General Integrity: Intact D		Altered Moved Date(s):		ed Date(s):		
Historic Name		Securi	ty Building			
Current/Commo	n Name	Securi	ty Building			
Historic/Original	Owner	Palisad	des Nuclear F	Plant		
Historic Building	Use	Industr	ial			
Current Building	Use	Industr	ial			
Architect/Engine	er/Designer	Unkno	wn			
Builder/Contractor Unkno		wn				
Survey Date	6/19/2024	Rec	orded By	Angeli	que Theriot	Agency Report #

For SHPO Use Only	SHPO Concurrence?: Y / N	Date:

Provide a detailed description of the property, including all character defining features and any accessory resources.

The Security Building is a one-story ca. 1979 Industrial Vernacular style building located northwest of the Administration Building. Due to access permissions, no photographs of the Security Building's exterior were allowed during survey. The prefabricated metal building rests on a concrete slab foundation with an irregular plan. The building possesses no fenestration on the north, east, and south facades. The main entrance is offset on the north façade within a small vestibule sheltered by an attached canopy. An electrified fence encloses the building's low pitched gabled roof. The building's roof is covered with metal factory panel. The building is utilitarian in design and features no exterior ornamentation.

History of the Resource

Provide information on previous owners, land use, construction and alteration dates in a narrative format. <u>This is required</u> for all intensive level surveys and designation and recommended for other identification efforts.

The resource is an ancillary feature within the Palisades Nuclear Plant property. The building was constructed ca. 1979 for a support function. The structure does not appear altered or moved

Statement of Significance/Recommendation of Eligibility

Provide a detailed explanation of the property's eligibility for the National Register, including an evaluation under at least one of the four criteria, discussion of the seven aspects of integrity, and recommendations about eligibility. <u>This is required</u> for all properties.

The Security Building is an ancillary facility not associated with events that have made a significant contribution to the broad patterns of history. SEARCH recommends the building is not significant under Criterion A. Background research indicates the resource lacks association with any person(s) significant in history, and is recommended not significant under Criterion B. The resource's design is minimal, utilitarian, generally lacks architectural or engineering distinction and is recommended not significant under Criterion D because it lacks the potential to yield further information of historical importance. SEARCH recommends the resource is not eligible for NRHP inclusion.

References

List references used to research and evaluate the individual property.

Nationwide Environmental Title Research (NETR) Online

1976 Aerial Imagery of the PNP, Covert Township, MI. Electronic document, https://historicaerials.com/viewer, accessed June 2024.



Security Building_a Facing NW






Street Address	27780 Blue Star Hig	hway		
City/Township, State, Zip Code	Covert, MI 49043			
County	Van Buren			
Assessor's Parcel #	80-07-005-002-00			
Latitude/Longitude (to the 6th dec	cimal point) Lat:		Long:	
Ownership Private 🛛	Public-Local	Public-State	Public-Federal	Multiple

Property Type

Building 🛛 select sub-type below	Structure
Commercial	
Residential	Object
Industrial 🖂	-
Other	

Architectural Information

Construction Date	Ca. 1979
Architectural Style	Industrial Vernacular
Building Form	Rectangular
Roof Form	Gable
Roof Materials	Metal
Exterior Wall Materials	Metal
Foundation Materials	Concrete
Window Materials	N/A
Window Type	N/A
Outbuildings	Yes 🗌 🛛 No 🖾
Number/Type:	



Eligibility

Individually Eligible	Criterion A		Criterion B		Criterion C	Crit	erion D
Criteria Considera	ations:		a. 🗌 b. 🗌	c. [] d. 🗌 e. 🗌 f		g. 🗌
Component of a Historic District	Contributin district	g to a	Non-contribution to a district	ng	Historic District Na	ame:	Palisades Nuclear Plant Complex; Recommended not NRHP eligible
Not Eligible 🛛							
Area(s) of Signific	cance	N/A					•
Period(s) of Signi	ificance	N/A					
Integrity – Does t	he property	oossess	integrity in all o	r son	ne of the 7 aspects?	>	
Location	Design	Mate	rials 🗌 Wor	kmar	nship 🗌 Setting		Feeling Association
General Integrity:		Intact [Alt	tered	Mo	ved 🗌	Date(s):ca. 2014
Historic Name		East Storage Building					
Current/Common	Name	East Storage Building					
Historic/Original (Owner	Palisades Nuclear Plant					
Historic Building	Use	Industrial					
Current Building	Use	Industrial					
Architect/Enginee	/Engineer/Designer Unknown						
Builder/Contracto	Builder/Contractor Unknown						
Survey Date 6	6/19/2024	Rec	orded By Ar	ngelic	que Theriot	Ag	gency Report #

Form date: 6/25/2019

Provide a detailed description of the property, including all character defining features and any accessory resources.

The East Storage Building is a one-story ca. 1979 Industrial Vernacular style warehouse located on the south side of Palisades Power Plant Road. The prefabricated metal building rests on a concrete slab foundation with a rectangular plan. Bays enclosed by roll-down metal doors are located on the east, west, and north facades. An entrance enclosed by a solid metal door below a small wood portico is located on the south façade. The building's gabled roof is covered with metal factory panel. The building is utilitarian in design and features no exterior ornamentation.

History of the Resource

Provide information on previous owners, land use, construction and alteration dates in a narrative format. <u>This is required</u> for all intensive level surveys and designation and recommended for other identification efforts.

The resource is an ancillary feature within the Palisades Nuclear Plant property. The building was constructed ca. 1979 for a support function. The structure does not appear altered or moved. The building's exterior and roof are clad with nonhistoric replacement metal factory panel.

Statement of Significance/Recommendation of Eligibility

Provide a detailed explanation of the property's eligibility for the National Register, including an evaluation under at least one of the four criteria, discussion of the seven aspects of integrity, and recommendations about eligibility. <u>This is required for all properties</u>.

The East Storage Building is an ancillary facility not associated with events that have made a significant contribution to the broad patterns of history. SEARCH recommends the building is not significant under Criterion A. Background research indicates the resource lacks association with any person(s) significant in history, and is recommended not significant under Criterion B. The resource's design is minimal, utilitarian, generally lacks architectural or engineering distinction and is recommended not significant under Criterion C. The resource is recommended not significant under Criterion D because it lacks the potential to yield further information of historical importance. SEARCH recommends the resource is not eligible for NRHP inclusion.

References

List references used to research and evaluate the individual property.

Nationwide Environmental Title Research (NETR) Online

1976 Aerial Imagery of the PNP, Covert Township, MI. Electronic document, https://historicaerials.com/viewer, accessed June 2024.



East Storage Building_a Facing W



East Storage Building_b Facing SE



East Storage Building_c Facing NW



East Storage Building_d Facing S







Street Address	27780 Blue Star Hig	hway		
City/Township, State, Zip Code	Covert, MI 49043			
County	Van Buren			
Assessor's Parcel #	80-07-005-002-00			
Latitude/Longitude (to the 6th dec	cimal point) Lat: 4	2.323560°	Long: -86.304738°	
Ownership Private 🛛	Public-Local	Public-State	Public-Federal	Multiple

Property Type

Building 🖾 select sub-type below	Structure
Commercial	
Residential	Object
Industrial 🖂	
Other	

Architectural Information

Construction Date	Ca. 1979
Architectural Style	Industrial Vernacular
Building Form	Rectangular
Roof Form	Gable
Roof Materials	Metal
Exterior Wall Materials	Metal
Foundation Materials	Concrete
Window Materials	N/A
Window Type	N/A
Outbuildings	Yes 🗌 🛛 No 🖂
Number/Type:	



Eligibility

Individually Eligible	Criterion A		Criterion B		Criterion C [Crit	erion D	
Criteria Conside	rations:		a. 🗌 b. [C. [de	f	g. 🗌	
Component of a	Contributin	g to a	Non-contri	buting	Historic Distric	ct Name:	Palisades Nucl	ear Plant
Historic District	district		to a district				NRHP eligible	ommended not
Not Eligible								
Area(s) of Signif	ficance	N/A						
Period(s) of Sigr	nificance	N/A						
Integrity – Does	the property	possess	integrity in a	all or sor	ne of the 7 aspe	ects?		
Location	Design 🗌	Mate	erials 🗌 🛝	Norkma	nship 🗌 Se	etting	Feeling	Association
General Integrity	y:	Intact Altered Moved Date(s):ca. 1997				(s):ca. 1997		
Historic Name		East Radwaste Building						
Current/Commo	n Name	East Radwaste Building						
Historic/Original	Owner	Palisades Nuclear Plant						
Historic Building	Use	Industrial						
Current Building	Use	Industrial						
Architect/Engine	er/Designer	Unknown						
Builder/Contract	tor	Unknown						
Survey Date	6/19/2024	Rec	orded By	Angeli	que Theriot	Ag	gency Report #	

For SHPO Use Only	SHPO Concurrence?: Y / N	Date:

Provide a detailed description of the property, including all character defining features and any accessory resources.

The East Radwaste Building is a one-story ca. 1979 Industrial Vernacular style warehouse located north of the Switchyard on a paved access road. The building houses storage for radioactive waste. The building is located on a paved lot behind a perimeter fence. The prefabricated metal building rests on a concrete slab foundation with a rectangular plan. The building's gabled roof is covered with metal factory panel. Full height bays on the southwest and southeast facades are enclosed by roll-down metal doors. A main entrance is centrally located on the southwest façade next to the full-height bay and is enclosed by a metal door with an upper light. The building is utilitarian in design and features no exterior ornamentation.

History of the Resource

Provide information on previous owners, land use, construction and alteration dates in a narrative format. <u>This is required</u> for all intensive level surveys and designation and recommended for other identification efforts.

The resource is an ancillary feature within the Palisades Nuclear Plant property. The building was constructed ca. 1979 for a support function. A ca. 1997 rear addition nearly doubled the building's footprint (NETR 1976, 1997).

Statement of Significance/Recommendation of Eligibility

Provide a detailed explanation of the property's eligibility for the National Register, including an evaluation under at least one of the four criteria, discussion of the seven aspects of integrity, and recommendations about eligibility. <u>This is required</u> for all properties.

The East Radwaste Building is an ancillary facility not associated with events that have made a significant contribution to the broad patterns of history. SEARCH recommends the building is not significant under Criterion A. Background research indicates the resource lacks association with any person(s) significant in history, and is recommended not significant under Criterion B. The resource's design is minimal, utilitarian, generally lacks architectural or engineering distinction and is recommended not significant under Criterion D because it lacks the potential to yield further information of historical importance. SEARCH recommends the resource is not eligible for NRHP inclusion.

References

List references used to research and evaluate the individual property.

Nationwide Environmental Title Research (NETR) Online

- 1976 Aerial Imagery of the PNP, Covert Township, MI. Electronic document, https://historicaerials.com/viewer, accessed June 2024.
- 1997 Aerial Imagery of the PNP, Covert Township, MI. Electronic document, https://historicaerials.com/viewer, accessed June 2024.



East Radwaste Building_a Facing NE



East Radwaste Building_b Facing N



East Radwaste Building_c Facing N







Street Address	Blue Star Highway	/		
City/Township, State, Zip Code	Covert, MI 49043			
County	Van Buren			
Assessor's Parcel #	80-07-004-004-00			
Latitude/Longitude (to the 6th dec	cimal point) Lat:	42.324130°	Long: -86.299263°	
Ownership Private 🛛	Public-Local	Public-State	Public-Federal	Multiple

Property Type

Building 🗌 select sub-type below	Structure 🛛
Commercial 🗌	
Residential	Object
Industrial 🗌	-
Other	

Architectural Information

Construction Date	Ca. 1979
Architectural Style	No Style
	-
Building Form	N/A
Roof Form	N/A
Roof Materials	N/A
Exterior Wall Materials	N/A
Foundation Materials	N/A
Window Materials	N/A
Window Type	N/A
Outbuildings	Yes 🗌 🛛 No 🖾
Number/Type:	



Eligibility

Individually Eligible	Criterion A		Criterion B		Criterion C	Crit	erion D	
Criteria Consider	rations:		a. 🗌 b. 🛛	□ c. [d. ∏ e. ∏ f.	Π	q. 🗌	
Component of a Historic District	Contributin district	g to a	Non-contrib to a district	Non-contributing Historic District Name:		ne:	Palisades Nuclear Plant Complex: Recommended not NRHP Eligible	
Not Eligible								
Area(s) of Signifi	icance	N/A			·		·	
Period(s) of Sign	ificance	N/A						
Integrity – Does	the property	possess	integrity in a	ll or sor	ne of the 7 aspects?			
Location	Design 🗌	Mate	erials 🗌 V	Vorkma	nship 🗌 Setting		Feeling Association	
General Integrity	' :	Intact D		Altered	□ Mov	ed 🗌] Date(s):	
Historic Name		Meteor	ological Tow	'er				
Current/Commor	n Name	Meteor	Meteorological Tower					
Historic/Original	Owner	Palisad	des Nuclear I	Plant				
Historic Building	Use	Meteorological Tower						
Current Building	Use	Meteorological Tower						
Architect/Engine	er/Designer	Unknown						
Builder/Contracte	or	Unknown						
Survey Date	6/19/2024	Rec	orded By	Angeli	que Theriot	Ag	gency Report #	

For SHPO Use Only	SHPO Concurrence?: Y / N	Date:

Provide a detailed description of the property, including all character defining features and any accessory resources.

The ca. 1979 Meteorological Tower is located approximately 0.40 km (0.25 mi) east of the East Radwaste Building adjacent to the Blue Star Highway. The aluminum tower is located on hilly terrain within red oak, white ash, sassafras, and sugar maple forest (No Author 2005). The tower is 10 m (32.80 ft) in height and provides data such as wind speed, wind direction, and temperature. This data is used to determined atmospheric stability and atmospheric mixing heights (No Author 2005). The structure is utilitarian in design and features no exterior ornamentation.

History of the Resource

Provide information on previous owners, land use, construction and alteration dates in a narrative format. <u>This is required</u> for all intensive level surveys and designation and recommended for other identification efforts.

The resource is an ancillary feature within the Palisades Nuclear Plant property. The building was constructed ca. 1979 for a support function. The structure does not appear altered or moved.

Statement of Significance/Recommendation of Eligibility

Provide a detailed explanation of the property's eligibility for the National Register, including an evaluation under at least one of the four criteria, discussion of the seven aspects of integrity, and recommendations about eligibility. <u>This is required</u> for all properties.

The Meteorological Tower is an ancillary facility not associated with events that have made a significant contribution to the broad patterns of history. SEARCH recommends the resource is not significant under Criterion A. Background research indicates the resource lacks association with any person(s) significant in history, and is recommended not significant under Criterion B. The resource's design is minimal, utilitarian, generally lacks architectural or engineering distinction and is recommended not significant under Criterion D because it lacks the potential to yield further information of historical importance. SEARCH recommends the resource is not eligible for NRHP inclusion.

References

List references used to research and evaluate the individual property.

No Author

2005 "Applicant's Environmental Report: Operating License Nuclear Plant. Palisades Nuclear Plant. Nuclear Management Company. Docket No. 50-255. License No. DPR-20".



Meteorological Tower_a Facing W



Meteorological Tower_b Facing NW







Street Address		27780 Blue Star H	Highway				
City/Township, State,	, Zip Code	Covert, MI 49043					
County	,	Van Buren					
Assessor's Parcel #		80-07-005-002-00					
Latitude/Longitude (to	o the 6 th decir	mal point) Lat:	:: 42.329489° Long: -86.308707°				
Ownership Private		Public-Local	Public-State Public-Federal Multiple				
Property Type			(Insert primary photograph below.)				
Building Select su Commercial C Residential I Industrial O Other C	ıb-type below	Structure Object					
Architectural Inform	nation						
Construction Date	Ca. 196	67					
Architectural Style	No Styl	е					
Building Form	N/A						
Roof Form	N/A						
Roof Materials	N/A						
Exterior Wall Materia	ls Concre	te					
Foundation Materials	Concre	te					
Window Materials	N/A						
Window Type	N/A						
Outbuildings	Yes						
Number/Type:							
Eligibility							
Individually Cr	iterion A	Criterion B	Criterion C C Criterion D				
Eligible							
Criteria Consideration	ns:	a. 🔄 b. 🗌] c. 📋 d. 🔄 e. 🔄 f. 🔄 g. 🔄				
Component of a Co	ontributing to	a Non-contribut	uting Historic District Name: Palisades Nuclear Plant				

Individually Eligible	Criterion A	Criterion A			Criterion C	Crit	erion D	
Criteria Conside	erations:		a. 🗌 b. 🛛	C. [d. e. f.	. 🗌	g. 🗌	
Component of a	Contributin	g to a	Non-contrib	outing	Historic District Na	me:	Palisades Nucl	ear Plant
Historic District	district		to a district				Complex; Reco	mmended not
							NRHP eligible	
Not Eligible								
Area(s) of Signif	ficance	N/A	•		•			
Period(s) of Sig	nificance	N/A						
Integrity – Does the property possess integrity in all or some of the 7 aspects?								
Location	Design	Mate	erials 🗌 V	Vorkma	nship 🗌 Setting		Feeling	Association
General Integrity	y:	Intact Altered Moved Date(s):				(s):		
Historic Name		Post-T	Post-Tensioning Testing Structure					
Current/Commo	n Name	Post-T	Post-Tensioning Testing Structure					
Historic/Original	Owner	Palisad	des Nuclear I	Plant				
Historic Building	l Use	Palisades Nuclear Plant						
Current Building	j Use	Industrial						
Architect/Engine	er/Designer	Unknown						
Builder/Contract	tor	Unknown						
Survey Date	6/19/2024	Rec	corded By	Angeli	que Theriot	A	gency Report #	

For SHPO Use Only	SHPO Concurrence?: Y / N	Date:
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Form date: 6/25/2019

Provide a detailed description of the property, including all character defining features and any accessory resources.

The ca. 1967 post-tensioning testing structure is located approximately 0.77 km (0.48 mi) north of the PNP building in a forested area offset west of Palisades Power Plant Road. The approximately 46.63 m (153 ft) semicircular concrete structure was built to test the tensioning system within the Containment Building prior to its construction. After its use for this purpose, it was abandoned in place.

History of the Resource

Provide information on previous owners, land use, construction and alteration dates in a narrative format. <u>This is required</u> for all intensive level surveys and designation and recommended for other identification efforts.

The resource is an ancillary feature within the Palisades Nuclear Plant property. The building was constructed ca. 1967 prior to the containment building's construction for the utilitarian purpose of testing its building materials. The structure does not appear altered or moved.

Statement of Significance/Recommendation of Eligibility

Provide a detailed explanation of the property's eligibility for the National Register, including an evaluation under at least one of the four criteria, discussion of the seven aspects of integrity, and recommendations about eligibility. <u>This is required for all properties</u>.

The resource is a minor piece of construction-related infrastructure. The ancillary structure is not associated with events that have made a significant contribution to the broad patterns of history. SEARCH recommends the resource is not significant under Criterion A. Background research indicates the resource lacks association with any person(s) significant in history, and is recommended not significant under Criterion B. The resource's design is minimal, utilitarian, generally lacks architectural or engineering distinction and is recommended not significant under Criterion C. The resource is recommended not significant under Criterion D because it lacks the potential to yield further information of historical importance. SEARCH recommends the resource is not eligible for NRHP inclusion.

References

List references used to research and evaluate the individual property.

Nationwide Environmental Title Research (NETR) Online
1976 Aerial Imagery of the PNP, Covert Township, MI. Electronic document, https://historicaerials.com/viewer, accessed June 2024.



Testing Structure_a Facing NE



Testing Structure_b Facing N



Testing Structure_c Facing NW



Testing Structure_d Facing SE







Street Address	27780 Blue Star Hig	27780 Blue Star Highway					
City/Township, State, Zip Code	Covert, MI 49043	Covert, MI 49043					
County	Van Buren						
Assessor's Parcel #	80-07-005-002-00						
Latitude/Longitude (to the 6 th dec	cimal point) Lat: 4	2.322721°	Long: -86.308555°				
Ownership Private 🛛	Public-Local	Public-State	Public-Federal	Multiple			

Property Type

Building Select sub-type below	Structure
Commercial	
Residential	Object
Industrial 🗌	-
Other	

Architectural Information

Ca. 1967
No Style
N/A
Yes 🗌 🛛 No 🖾



Eligibility

Individually Eligible	Criterion A		Criterion B		Criterion C		Criteri	ion D]
Criteria Consider	ations:		a. 🗌 b. [C. [d e	e. 🗌 f. [g	. 🗌	
Component of a Historic District	Contributin district	Contributing to a district		outing	Historic District Name:		ne: F C	Palisades Nuclear Plant Complex; Recommended not NRHP eligible	
Not Eligible 🛛									
Area(s) of Signific	cance	N/A							
Period(s) of Sign	ificance	N/A							
Integrity – Does t	he property	oossess	integrity in a	Ill or sor	ne of the 7 a	spects?			
Location	Design	Mate	rials 🗌 V	Vorkmai	nship 🗌	Setting	l F	Feeling [Association
General Integrity:		Intact [Altered	\boxtimes	Move	d 🗌		Date(s):
Historic Name		Chesa	beake and C	hio Rail	road Spur				
Current/Common	Name	Palisades Power Plant Road, Van Buren Trail							
Historic/Original	Owner	Chesapeake and Ohio Railroad							
Historic Building	Use	Industrial, Transportation							
Current Building	Use	Industrial, Transportation							
Architect/Enginee	er/Designer	Unknown							
Builder/Contracto	or	Unkno	wn						
Survey Date 6	6/19/2024	Rec	orded By	Angelio	que Theriot		Age	ncy Repo	ort #

For SHPO Use Only	SHPO Concurrence?: Y / N	Date:

Provide a detailed description of the property, including all character defining features and any accessory resources.

The Chesapeake and Ohio Railroad (C&O) comprised approximately 150 smaller railroad lines incorporated between 1836 and the 1960s (C&O Historical Society 2024). The mainline is depicted as the Pere Marquette Railway east of the PNP plant on the earliest topographic quadrangle map of the area, 1927 *South Haven, MI* (USGS 1927). The C&O merged with the Pere Marquette Railway in 1947 (C&O Historical Society 2024). The track remained in place until at least 1981, as it is depicted on the 1981 *Covert, MI* USGS topographic quadrangle map (USGS 1981). Within the survey area, the spur measured approximately 1.51 km (0.94 mi) between the Blue Star Highway and the PNP's Auxiliary Building.

History of the Resource

Provide information on previous owners, land use, construction and alteration dates in a narrative format. <u>This is required</u> for all intensive level surveys and designation and recommended for other identification efforts.

The ca. 1967 Chesapeake and Ohio Railroad (C&O) Spur alignment formerly linked the PNP building with the C&O main line in southwest South Haven, Michigan. The resource is a minor spur track built to facilitate PNP construction between 1967 and 1971. An approximately 19.51 (64 ft) segment of track infilled with concrete remains east of the Auxiliary Building's main bay behind a perimeter fence. Survey did not identify extant track within the survey area along Palisades Power Plant Road or northeast of the East Radwaste Building. Outside the survey area, a segment of the former alignment has been replaced by the Van Buren Multi-Use Trail in Van Buren State Park.

Statement of Significance/Recommendation of Eligibility

Provide a detailed explanation of the property's eligibility for the National Register, including an evaluation under at least one of the four criteria, discussion of the seven aspects of integrity, and recommendations about eligibility. <u>This is required</u> for all properties.

The track represents a minor spur track built for PNP construction between 1967 and 1971. The resource is associated with the Containment Building's on-site construction and with the PNP's construction overall via regional transportation link. SEARCH recommends the resource is significant under Criterion A for this association. Within the survey area, the resource has been either removed or over paved by Palisades Power Plant Road and the Palisades Access Road. An approximately 19.51 (64 ft) segment of track infilled with concrete remains east of the Auxiliary Building. The segment represents the only remaining portion identified of the former 1.51 km (0.94 mi) within the Survey Area. The resource no longer retains its integrity of *location, design, workmanship* or *materials*. The resource remains within the PNP complex, and retains its integrity of *setting*. The resource no longer retains sufficient integrity to convey its significance. SEARCH recommends the resource is not eligible for NRHP inclusion.

References

List references used to research and evaluate the individual property.

C&O Historical Society

- 2024 "History of the C&O Railway". Electronic document, https://cohs.org/history/, accessed June 2024. US Geological Survey (USGS)
- 1927 South Haven, MI topographic quadrangle map (1:250000). Electronic document, https://ngmdb.usgs.gov/, accessed June 2024.
- 1981 *Covert, MI* topographic quadrangle map (1:250000). Electronic document, https://ngmdb.usgs.gov/, accessed June 2024.



Chesapeake and Ohio Spur_c Facing SE



Chesapeake and Ohio Spur_a Facing NW



Chesapeake and Ohio Spur_b Facing E



