FEASIBILITY AND PLAN OF OPERATION REPORT

Siemens Energy, Inc.
Rothchild, Wisconsin

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ABBREVIATIONS

ACS	American Community Survey
CFR	Code of Federal Regulations
DOT	Department of Transportation
Facility	Siemens Energy
FEMA	Federal Emergency Management Agency
FPOR	Feasibility and Plan of Operations Report
HW	Hazardous Waste
MOC	Materials of Construction
NAICS	North American Industry Classification System
NHI	Natural Heritage Inventory
NR	Natural Resources
OSHA	Occupational and Safety and Health Administration
PACT	Powdered Activated carbon and Activated Sludge Treatment
PPE	Personal Protective Equipment
RCRA	Resource Conservation and Recovery Act
SCFM	Standard Cubic Feet Per Minute
SDS	Safety Data Sheet
SWMU	Solid Waste Management Unit
THC	total hydrocarbons
USEPA	United States Environmental Protection Agency
VO	Volatile Organic
WAO	Wet Air Oxidation
Warehouse	Hazardous Waste Storage Warehouse
WDNR	Wisconsin Department of Natural Resources
WPDES	Wisconsin Pollution Discharge Elimination System
WWTU	Wastewater Treatment Unit
ZEO	Zimpro Electro Oxidation

A. GENERAL REQUIREMENTS

A.1 INTRODUCTION

The purpose of this Feasibility and Plan of Operation Report (FPOR) is to meet the requirements of NR 670, Wis. Adm. Code and to evaluate the potential environmental risks and alternatives associated with an application by Siemens Energy Inc. (Siemens) located at 301 W. Military Road, Rothschild, WI 54474 to relicense their hazardous waste storage facility (the Facility). Previously the site was licensed for hazardous waste treatment and hazardous waste storage in tanks and containers. Licensed hazardous waste treatment and tank storage no longer occur. This FPOR describes the current operations to remain licensed, which consist of hazardous waste container storage in two units: the Hazardous Waste Storage Warehouse and the Pilot Plant. There are no public funds involved with the relicensing of this hazardous waste storage facility.

The Facility's (NAICS Code 333249) expertise is in the development, sales, design and construction of water and wastewater treatment systems. Characterization tests and feasibility study activities are conducted at the Facility to support sales, develop, and improve products, and support engineering of wastewater treatment system designs. This facility was established in 1961 (as Zimpro) and currently serves as Siemens' Water Solutions Business Unit headquarters. Siemens Water Solutions currently has two facilities in the United States, with the other (located in Broussard, Louisiana) specializing in offshore equipment installation and service.

Storage and treatment of non-hazardous solid waste will be performed and controlled in the same manner as hazardous waste treatment and storage in order to achieve an equivalent level of environmental protection. Administrative requirements unique to the hazardous waste regulations (such as manifesting and annual hazardous waste reporting) will not be mandatory for non-hazardous waste management activities. In this way, Siemens Energy is not proposing to separately obtain solid waste management facility licensing pursuant to NR 502.

The FPOR is generally organized to follow the DNR completeness and technical evaluation checklist which is provided in Appendix K. The FPOR also incorporates the informational elements established in the DNR's July 25, 2019 letter which is provided in Appendix O.

The EPA's Hazardous Waste Permit Part A form is provided in Appendix J. The operator of the facility is Siemens Energy, inc which is a publicly traded company located at 301 W. Military road, Rothschild WI 54474. The general facility contact phone number is 715-359-7211. The owner of the property is also Siemens Energy, Inc, with an address of 4400 N. Alafaya Trail, Orlando FL 32826 listed on the deed. The general contact phone number for this address is 407-736-2084. The facility is located on private property and not on Indian lands. The site is located on 26.8 acres of land with a latitude of 44.878175 degrees North and a longitude of 89.635582 degrees West, and is in Section 26, Township 28N, Range 07E.

A.2 SITE DESCRIPTION

The Facility is located at 301 West Military Road on 26.8 acres of land in the Village of Rothschild just east of the Wisconsin River. Approximately 13,000 square feet are involved in the licensed waste storage areas. The Facility also houses a Pilot Plant for feasibility studies and product development, laboratories for characterization and feasibility study support, metal fabrication operations, and administrative areas.

The present land use at the facility is the same as the intended use following re-licensing of the facility. The Facility is involved in the development, sale, design and construction of waste and wastewater treatment systems. Specialized waste and wastewater treatment equipment is manufactured at this site. Characterization tests and feasibility study activities are conducted at the Facility to support sales, develop and improve products, and support engineering of wastewater treatment system designs.

The area to the north and east of the site is mainly residential, with some light commercial development. Zimpro Park, owned by Village of Rothschild, is located immediately north of the facility.

The area to the south of the facility is forest and scrub brush, which is currently undeveloped. A whey processing plant is located approximately 4,000 feet south of the facility. West of the facility, the land is used for light density residence, agriculture, and forest. There are no known historic sites that would be affected by this facility. The only known archaeological sites are to the southeast, about 2,000 to 4,000 feet south of the facility. There are no nursing homes or hospitals within 1/2 mile of the facility.

A.3 GENERAL OPERATIONS

Hazardous and non-hazardous wastes are received from clients desiring the Facility to evaluate possible waste and wastewater treatment technologies and equipment. Wastes received by the facility are either designated for either characterization testing or feasibility studies. Pursuant to the Analytical Sample exemption, NR 661.0004(4), small volumes (<3 gallons) of waste samples for characterization testing work in Siemens Energy's on-site laboratory are conditionally exempt from the hazardous waste requirements in NR 661 to NR 670. Wastes for feasibility studies include Treatability Study exempt waste, Hazardous waste undergoing wastewater treatment unit (WWTU) treatment, Non-hazardous waste, and Process fluids (non-solid waste) that is received to evaluate our treatment technologies.

Waste undergoing treatability studies are conditionally exempt from certain hazardous waste requirements by s.NR 661.0004(6), although remain hazardous wastes. Samples that conform to the conditions in NR 661.0004(6)(a)-(k) (such as volume and time constraints) are exempt from hazardous waste manifesting, storage, and treatment regulations (including licensing) and from import requirements in NR 662 Subch. H.

Hazardous waste, while undergoing treatment in a wastewater treatment unit (WWTU) as defined in NR 660(141), are excluded from all hazardous waste treatment and disposal requirements by s.NR 664.0001(7)(f), although they remain hazardous wastes. This exclusion does not apply prior to and after such treatment.

Feasibility studies performed on non-hazardous wastes and process fluids/products are not subject to NR 600 to NR679 pursuant to NR661.0003(1) and NR661.0002(1) respectively. As addressed in Section A.1, non-hazardous wastes will be controlled in the same manner as hazardous waste.

The facility will use a form labeled "Customer Sample/Waste Receipt Guidance form" to ensure waste is brought in properly and that appropriate documentation is maintained. The "Customer Sample/Waste Receipt Guidance form" is provided in the Waste Analysis Plan (Appendix F). This form is completed for all characterization and feasibility samples brought into the facility and will be maintained for 5 years following the last entry. It is used to properly identify which category the waste will be received under: Characterization, Treatability Study, Hazardous waste, non-hazardous waste, or Process fluid. The form is also used to ensure that the proper documentation is received, such as manifests, and as applicable that regulatory agency notifications occur.

Upon receipt of the waste sample the pertinent information is entered into the "Active Waste Inventory" form provided in Appendix D. This form tracks the waste received by category and, along with the Waste Characterization (WAP

Appendix F) and Customer Sample/Waste Receipt Checklist forms, ensures the facility properly identifies the type of waste received and treatment to be performed. The Active Waste inventory form is reviewed quarterly to ensure all wastes received were indeed entered into the spreadsheet upon receipt. The receipt dates of the active wastes are also reviewed quarterly to ensure that the proper procedures are implemented if the wastes are to be retained for longer than one (1) year. If the need to retain any waste received, with volumes >3 gallons, for longer than one (1) year is identified a letter will be generated notifying the DNR of the need to retain the waste. The letter will include a description of the waste, quantity, and reason for the need for a longer retention period. The Active Waste Inventory form will be maintained in the operating record for three years following the last review date.

Upon receipt all containers containing feasibility study wastes (>3 gallons) will be labeled with the following information to properly define their regulatory status and type of treatment planned.

1.) Regulatory Status labeled as one of the following: Hazardous Waste, non-Hazardous Waste, or non-solid waste, process fluid
2.) Treatment (for Hazardous waste) to occur labeled as either: WWTU treatment or Treatability Study Testing

A “Sample Usage Form”, provided in Appendix N, is attached to all waste containers over 3 gallons immediately upon storage in either the Pilot Plant or Hazardous Waste Storage Warehouse. This form tracks how much of the waste was removed from the containers on what days.

Initial characterization samples are generally small volumes (3 gallons or less) to determine the characteristics and composition of the waste. If the initial characterization testing indicates that the waste may be applicable to one of the facilities’ treatment technologies, a larger scale feasibility study may be performed in the Pilot Plant or laboratory bench scale. Following such characterization testing and feasibility studies, a sales proposal may be created. Ultimately, Siemens may design and construct wastewater treatment equipment for the client’s use. No commercial waste storage or treatment activities are performed at the facility.

Wastes are normally received in containers, which range in size from less than three (3) gallons (for characterization samples) to 55-gallon drums and 275-gallon totes. Containers are off-loaded at the shipping and receiving loading dock or Pilot Plant loading dock. Locations of these loading docks can be found in Appendix A, figure B-10. Smaller samples (<3 gallons) are delivered directly to the lab. Larger waste containers are staged in the Pilot Plant or Hazardous Waste Storage Warehouse while sampling and other waste acceptability reviews are conducted. Once accepted, the containers are stored in the appropriate storage area (typically the Hazardous Waste Storage Warehouse) until treatment activities are planned in the Pilot plant. Wastes or wastewaters are only rarely received in bulk (e.g. tanker truck) deliveries. Historically, all bulk deliveries have been non-hazardous waste. Hazardous waste will not be accepted in bulk deliveries.

A.4 STORAGE

The Facility’s operational needs require the ability to store hazardous waste in containers prior to and after feasibility studies. Hazardous waste feasibility samples may potentially be received in excess of the treatability exemption threshold of 1,000 kilograms non-acute hazardous waste for a single treatability test. Likewise, portions of a feasibility study sample may be held for more than the one-year holding time threshold, with DNR approval. Therefore, the facility is required to be a licensed storage facility. Totes, drums, and pails will be stored in the Hazardous Waste Storage Warehouse and Pilot Plant which comprise the designated licensed storage areas. The Pilot Plant area may be used for storage of totes, drums, or pails for waste that are being used in conjunction with a feasibility study. Containers can

only be stored in the designated areas. The facility's licensed storage capacity allows storage of up to 20,112 gallons of containerized hazardous waste in the Hazardous Waste Storage building and Pilot Plant. In anticipation of a flood event, up to 22,400 gallons of non-hazardous and hazardous containerized solid waste can be moved from the Pilot Plant and other areas of the facility to the Hazardous Waste Storage building to prevent impacts to flood waters. Total facility inventory of hazardous and non-hazardous waste, containerized and in the process of being treated, will not exceed 22,400 gallons.

Feasibility and characterization samples will be stored in containers in good condition. The material of construction of the containers will be compatible with the stored material. Containers will always be kept closed, except when adding or removing sample from the container. All containers will be properly labeled. Inspections of the storage areas will occur at least weekly and be documented.

No tank storage is required. The existing tanks regulated under the 2006 approval dated Nov. 28, 2006 are either associated with the WWTU test units (therefore not a licensed unit), being used in conjunction with a Treatability Study, or have been from licensed service.

The designated storage of hazardous and non-hazardous waste is limited to the following units:

a. Hazardous Waste Storage Warehouse: The Hazardous Waste Storage Warehouse is comprised of a main area of eight 3-level pallet racks and two flammables storage cabinets; a paint and flammables storage room; and a cooler room for materials that may require refrigeration (primarily raw materials). In the event of a spill there is a 1000 gallon holding tank (ST-6) in a separate containment area that can be used to pump waste into. Secondary containment capacities are 3,092 gallons for the main area storage, 494 gallons for the Flammable room, and 1,283 gallons for the ST-6 area.

b. Pilot Plant: The Pilot Plant has a total secondary containment capacity of 12,698 gallons (excluding the bermed-in area). The Pilot Plant containment system is constructed with curbs and foam thresholds at access/egress locations, to provide additional secondary containment. The Pilot Plant also has a bermed-in area with a containment capacity of 2,943 gallons that is constructed with a 6-inch concrete curb that provides hydraulic separation from the remaining portion of the Pilot Plant building.

A.5 FEASIBILITY STUDIES AND CHARACTERIZATION TESTING

Characterization testing occurs in the on-site lab. Feasibility studies occur in the Pilot Plant Building or as small bench scale studies in the on-site lab.

Characterization testing in the lab utilizes smaller samples (generally three (3) gallons or less) to identify the sample characteristics and composition which may include autoclave oxygen demand (AOD) and corrosion testing. Pursuant to NR661.0004(4), samples received at the facility for characterization testing and which are <3 gallons are conditionally exempt from the hazardous waste requirements in NR661 to NR670. Other than typical analyses that determine the characteristics or composition of a sample (i.e.: Flash point, pH, COD, sulfide, etc.) Siemens does perform bench scale autoclave testing to determine the Autoclave Oxygen Demand (AOD) and corrosion characteristics of a waste. It has been established that some compounds contained in the hazardous waste received at Siemens are not accurately analyzed by traditional wastewater analysis (COD, TOC, etc.). The AOD test is performed to verify the accuracy of

the other analysis that are performed during the characterization of the sample. Samples larger than 1 gallon can be needed for determining composition and characteristics depending on the sample and what analyses are required. Some analytical testing, such as EPA 8270, can require 3 liters alone. The AOD analysis can consume up to 1 liter as well as up to 2 liters for determining the corrosion characteristics.

The results of these analysis are used to screen potential waste or wastewater treatment methods and define larger feasibility study test parameters. Typically, characterization testing in the lab occurs before any feasibility study occurs in the Pilot Plant building or laboratory. The characterization testing has the added benefit of detecting the existence of incompatible wastes and materials of construction in a controlled laboratory environment. These characterization tests fall under the sample exclusion of NR 661.0004(4). The on-site Siemens lab is certified by Wisconsin DNR under NR 149. The most recent laboratory certification can be found in Appendix E.

Feasibility studies in the Pilot Plant or laboratory rely on the use of larger batches of customer wastes and wastewaters. Multiple types of treatment technologies, vessels, and equipment may be deployed in customized combinations and applications.

The feasibility study of hazardous waste at the Facility is exempt from hazardous waste treatment licensing and treatment facility requirements due to complying with the following exemptions.

1. Waste Water Treatment Unit (WWTU) exemption (NR 664.0001 (7)(f) and NR 670.001(3)(b)5., Wis. Admin. Code. “Wastewater treatment unit" is defined in NR 660.10(141). The treated wastewater from the feasibility studies is typically sent to the Village of Rothschild sanitary sewer in compliance with local discharge regulations (Appendix M) and is exempt under NR 661.0004(1)(a)2.
2. Treatability Study exemption (NR 661.0004(6) Wis. Admin. Code. “Treatability Study” is defined in NR 660.10(126).

Wastes received for Feasibility studies will be categorized as follows:

Treatability study exempt wastes must meet the requirements of NR 661.0004(6) (a) thru (k). Utilization of the Sample Receipt Checklist and Active Waste Inventory forms will ensure that wastes received under the Treatability Study exemption are identified properly and that proper documentation is generated and retained. The Active Waste Inventory form will be used to generate the Annual treatability report per NR 661.0004(6)(i) which will be submitted to the WI DNR by March 15th for all Treatability studies performed the previous year.

Hazardous waste received from offsite that does not meet the Treatability Study exemption requirements. These wastes will be treated under the WWTU exemption in ss. NR 664.0001(7)(f) and NR 670.001(3)(b).5 and treatment will meet the qualifications in ss. NR 660.10(141). The facility will utilize the Sample Receipt Checklist and Waste Characterization Form to properly identify incoming wastes as hazardous. US EPA will be notified through the WIETS or successor system at least 60 days prior to shipment of hazardous waste from a foreign source. The facility will not take management of any foreign hazardous waste until an Acknowledgement of Consent letter is received from the EPA. All other requirements regarding receiving hazardous waste from a foreign source required by NR 662.084 and NR 664.0012 will be followed. This would include, but not be limited to, proper maintenance of the movement document listed in NR664.084 (4) and Import Contract Requirements found in NR662.084 (6). The use of the Customer Sample/Waste Receipt Guidance form will ensure that these requirements are considered and met for foreign hazardous waste shipments.

If hazardous waste is received unmanifested the facility will submit a report to the WI DNR within 15 days according to NR 664.0076.

The facility will mail a copy of the manifest to the EPA and submit a copy in the e-manifest system if hazardous waste is received from a foreign source to the US EPA according to NR 664.0071(1)(c) within 30 days of receipt.

Non-Hazardous waste, neither a characteristic nor listed hazardous waste but still a solid waste, is received from offsite. These wastes will be treated under the WWTU exemption in ss. NR 664.0001(7)(f) and ss. NR 670.001(3)(b).5 and treatment will meet the qualifications in ss. NR 660.10(141).

Process Fluids/non-solid wastes are received from offsite and can potentially be hazardous material. Upon completion of the treatment of process fluids the remaining untreated material and treated material will be disposed of properly, either by sewering if non-hazardous and sewer ordinance compliant, by sending off-site to a disposal facility if deemed hazardous or be returned to the client. If the material is hazardous and is not being returned to the client after completion of the study, the material will be re-classified as hazardous waste generated by the facility.

Technologies used for Feasibility studies include:

- Pressure filtration
- Sand filtration
- Oil Water Separation
- Wet air oxidation (thermal)
- Electro oxidation (thermal)
- Hydrothermal treatment (thermal)
- Chemical oxidation
- PACT (powdered activated carbon and activated sludge)
- Granular carbon adsorption
- Absorptive resins
- Membrane treatment
- Heavy metals precipitation
- Neutralization

The hazardous wastes that are processed for feasibility study at the Facility are generally waste caustic solutions that contain high concentrations of long-chained organic compounds. These wastes have a pH greater than 12.5 and are therefore characteristically hazardous for corrosivity (D002). The wastes will often contain elevated levels of cyanide or sulfide compounds, which means the wastes are characteristically hazardous for reactivity (D003). These wastes are candidates for one of two pretreatment processes developed by the Facility. These processes are wet air oxidation (WAO) and Zimpro Electro Oxidation (ZEO). Both technologies reduce or eliminate the Chemical Oxygen Demand (COD) of the waste to levels that can be handled by conventional biological waste systems. The pH of the waste is neutralized by the process and the sulfides and cyanides are fully oxidized. Therefore, waste from feasibility pilot studies can typically be sent to the Village of Rothschild sanitary sewer in compliance with local discharge regulations. The Facility assures that the local discharge regulations are met prior to discharge by holding the effluent in a container or tank and testing the effluent in the on-site laboratory for the necessary parameters.

The facility has two WAO test systems; one larger unit (Pilot WAO), and a mini-WAO system. In the WAO systems, the wastewater is mixed with compressed air which then flows through a reactor. The wastewater is subjected to high temperatures and pressures, which allow the hydrocarbons, cyanides, and sulfides to be oxidized to carbon dioxide, water, and non-toxic compounds within the reactor. Following the reactor, the wastewater flows through a gas and liquid separator. The air is vented, and the effluent is collected for testing, then discharged to the sewer.

The large WAO systems can operate at a rate of about 15 gallons per hour, or about one tote of wastewater per day. Historically, the facility has performed one or two tests per year on the large WAO systems, though no such testing has been performed in the past three years.

The smaller WAO system has an inlet pump rated at 5 ½ liters per hour, with a maximum process throughput of about 25 gallons per day. The Facility performs three to four small WAO feasibility studies per year.

The WAO testing is performed over a period of two or three weeks on several batches of client wastewater. This feasibility study that is performed allows the engineers to determine proper temperatures, pressures, residence time, catalyst life, and catalyst type for each unique wastewater stream. Following each feasibility study interval, the entire system is flushed with city water to fully purge the unit and assure that residual contamination from one feasibility study will not interfere with the subsequent study to be performed on the unit. Additionally, most of the tubing (from the air injection point to the gas/liquid separator) is removed and properly recycled. Prior to the next test, the system is rebuilt. New tubing and fittings are put into place. The entire system is pressurized with city water to assure that there are no leaks and the system is prepared for the next test. The proper materials of construction for the reactor and tubing are determined during the characterization testing. The Facility has reactor vessels made from different metals, including Inconel and titanium, which are selected based on their compatibility with the client wastewater.

During each feasibility study, the system is visually monitored by the test engineer and continuously monitored for operating flowrate, temperature, and pressure. Relief valves prevent the system from over-pressurization. The tubing and the reactors are certified for pressures far in excess of the operating and relief pressures. An oxygen sensor on the outlet gas assures that sufficient air has been added to complete the oxidation process. A solenoid ball valve will shut down the system should an emergency be detected. The operator can manually shut down the system when issues are detected. The WAO systems are in the Pilot Plant building which provides secondary containment in the case of a release. No discharge can be made to the sanitary sewer directly from the WAO feasibility study testing system unless the study is being performed on a non-hazardous waste that already meets the local sewer ordinances. The effluent is collected and analyzed to make sure sewer discharge requirements are being met.

There are two ZEO pilot units, a large unit and a small unit. Both units are operated on a batch treatment basis. The small unit has a 55-gallon holding tank and normally operates with a 20-gallon batch. The larger unit has a 1,000 liter (250 gallon) holding tank and processes about 500 liters (132 gallons) per test. The pilot tests take up to 10 days to complete. Therefore, each of the units has a throughput less than 250 kg per day (about 65 gallons per day). The ZEO process operates at lower pressure and temperatures than the WAO units. The ZEO process takes advantage of the conductivity of the briny wastewaters that are optimal for the treatment technology. An electric current flowing through the system creates hydroxyl radicals from the water, which react with and destroy organic compounds in the wastewater stream. Both units are housed in the bermed containment area within the Pilot Plant, which provides secondary containment for the units. As with the WAO systems, the systems are flushed with city water between feasibility studies to assure no cross contamination between test runs.

In summary, after the feasibility study system is assembled in the Pilot Plant building, testing and verification of the equipment’s soundness and operability are performed using city water. Any equipment or process deficiencies are noted and corrected before feasibility study occurs. Feasibility study work is then performed, during which the system

is monitored, treatment samples and instrument readings are collected to verify the process is being conducted correctly, and to determine the efficacy of the treatment. At the completion of the treatment study, the treatment system is decontaminated and inspected, and the waste residuals are characterized and properly disposed.

Because the Facility is carefully evaluating treatment system performance for potential off-site, scaled-up commercial use, the pilot-scale testing processes and results are carefully developed and closely monitored. Detailed waste stream-specific test procedures are developed in written Project Run Instructions and treatment performance data are recorded in a Project Logbook. Prior to initiating a feasibility study project, a Pre-run Meeting and Briefing and associated training occurs with the participation of process designers and operators. Materials of Construction (MOC) testing is completed prior to full scale pilot testing if there are concerns regarding waste compatibility. Multiple runs using varying protocols may be performed during each Project, and each run is similarly controlled. The level of detail of this planning, monitoring and documentation exceeds the scope of most commercial waste treatment activities.

The Facility does operate process vents subject to Subchapter AA of NR 664. Section P addresses applicable emissions-related requirements in Subchapters BB and CC of NR 664

The following annual reports will be completed to show adherence to the WWTU and Treatability Study exemptions.

1) NR 664.0075 Annual report. The owner or operator shall prepare and submit a single copy of an annual report to the department by March 1 of each year. The annual report shall be submitted on department forms, shall cover facility activities during the previous calendar year and shall, at a minimum, include all the following:

(1) The EPA identification number, name and address of the facility.

(2) The calendar year covered by the report.

(3) For off-site facilities, the EPA identification number of each hazardous waste generator from which the facility received a hazardous waste during the year. For imported shipments, the report shall give the name and address of the foreign generator.

(4) A description and the quantity of each hazardous waste the facility received during the year. For off-site facilities, this information shall be listed by EPA identification number of each generator.

(5) The method of treatment, storage, or disposal for each hazardous waste.

(7) The most recent closure cost estimate under s. NR 664.0142, and, for disposal facilities, the most recent long-term care cost estimate under s. NR 664.0144.

(8) For generators who treat, store, or dispose of hazardous waste on-site, a description of the efforts undertaken during the year to reduce the volume and toxicity of waste generated.

(9) For generators who treat, store or dispose of hazardous waste on-site, a description of the changes in volume and toxicity of waste actually achieved during the year in comparison to previous years to the extent the information is available for the years prior to 1984.

(10) The certification signed by the owner or operator of the facility or an authorized representative.

2) NR 661.0004(6) Exclusions.

(i) The facility prepares and submits a report to the department by March 15 of each year that includes all the following information for the previous calendar year:

1. The name, address and EPA identification number of the facility conducting the treatability studies.
2. The types (by process) of treatability studies conducted.
3. The names and addresses of persons for whom studies have been conducted (including their EPA identification numbers).
4. The total quantity of waste in storage each day.
5. The quantity and types of waste subjected to treatability studies.
6. When each treatability study was conducted.
7. The final disposition of residues and unused sample from each treatability study.

The Facility is required to complete a one-time written notification to WDNR of its intent to provide Treatability Study testing. This FPOR will serve as the one-time notification.

A.6 STORAGE AND TREATMENT CAPACITY

The maximum allowable storage and treatment quantities are summarized below and will not be exceeded at any time.

a) Hazardous waste storage in containers facility wide will not exceed 20,112 gallons.

b) During flood conditions, containers of hazardous and non-hazardous waste in the Hazardous Waste Storage Warehouse will not exceed 22,400 gallons.

c) The maximum quantity of hazardous waste stored in containers in the laboratory will not exceed 200 gallons.

d) The site-wide sum of hazardous and non-hazardous waste will not exceed 22,400 gallons. This includes containerized storage, Treatability Study samples, laboratory samples, and waste in the process of being treated in the WWTU's.

e) The maximum quantity of hazardous and non-hazardous waste being stored for use in Feasibility studies in the Pilot Plant will not exceed 6,839 gallons.

A.7 SECONDARY CONTAINMENT

The Hazardous Waste Storage Warehouse is constructed to provide secondary containment for waste containers stored in the Warehouse. The epoxy cement exterior walls act as a containment structure for the warehouse. All joints between the cement block walls and the warehouse floor are sealed with silicone and/or epoxy paint. Two-inch-high roll curb (Appendix A, Figure B-18, detail 5/4) at the door openings complete the main containment structure. The ST-6 holding tank area has separate containment from the rest of the building which consists of an epoxy sealed cement outer wall and a 2-foot-high epoxy sealed cement block dike. The flammable storage room also has separate secondary containment within the Hazardous Waste Storage Warehouse. The flammables area is separated from the main part of the warehouse by a painted/sealed cement block wall and a sloped 2-inch threshold in the doorway which allows a

forklift to be used in the room while still maintaining containment. The location of the sloped threshold, roll curbs, and locations of the ST-6 and Flammable storage containment areas can be found in Appendix A, Figure B-29.

The Hazardous Waste Storage Warehouse floor is sloped to facilitate the draining of spilled liquids to one of 6 PVC floor drains. After entering a floor drain the liquid flows to a PVC sump area and is automatically pumped into ST-6. ST-6 is a 1000 gallon stainless steel holding tank that is only used for sump liquids. In the event of a spill, the waste (hazardous or non-hazardous) would then be pumped from the holding tank to appropriate totes or drums and disposed of properly. The location of the sump area can be found in Appendix A, figure B-29.

Secondary containment in the Pilot Plant building is provided by cement floors, 4 inch curbing, painted block walls, and foam thresholds. Some walls in the Pilot Plant are constructed with curbs (Appendix A, figure B-28, Section A-A) while others are painted cement block on top of the cement floor. Appendix A, figure B-31 indicates which walls are 4 inch curb and which are painted cement block. All joints between the floor and both the curbing and cement block are sealed with epoxy, silicone, or similar material. There are 2” foam thresholds maintained at access/egress locations which are attached to the floor using a heavy-duty construction adhesive and are sealed at the ends, either to the floor or adjacent barrier with silicone caulk. Any cracks or holes in the cement floor are sealed with epoxy or similar material. The Pilot Plant Building is constructed with floor drains that drain to the sanitary sewer system. While hazardous or non-hazardous wastes are being stored or handled within the Pilot Plant, plumbers’ plugs or stand pipes are installed in all floor drains that drain to the sanitary sewer to prevent waste from entering the sewer system. In order to allow temporary access to the sewer system for operationally necessary releases of dischargeable liquids, a plumber’s plug can be replaced with a stand pipe (through which the discharge occurs) to prevent any liquids spilled on the floor from entering the floor drain and sewer system. The stand pipes that are inserted into the floor drains have a gasket that provides a watertight seal with the drain. In all cases the stand pipe will extend at least 6 inches above grade. There are three floor drains that drain to the trench which is directly below the column 7 header on Appendix A, Figure B-31. These three drains, labeled F.D/T on Appendix A, Figure B-31, do not have to be plugged during operation. The drain vents in the Pilot Plant are at a minimum 9” above grade and the clean outs all have screw in threaded plugs to prevent waste from entering the sewer. The locations of the foam threshold barriers, floor drains, stand pipes, drain vents, curbing, and clean outs can be found in Appendix A, figure B-31.

There is also a bermed-in area within the Pilot Plant (that is also shown on figure B-31) can serve as additional tertiary containment. There are no floor drains within this area and the only access to the sewer is through permanent stand pipes. The permanent stand pipes extend at least 9 inches above the grade. The bases of the curbing and permanent stand pipes are sealed with epoxy and the whole area has a coat of epoxy coating to provide watertight containment. There is a sump pit in the bermed-in area but it is not connected to the sewer system. Appendix A, figures B-25A through B-25D and B-31 provide dimensions of the bermed-in area and locations of the stand pipes and sump pit. Drawings are labeled “Pilot Plant Concrete Curb Barrier S-3A” but this is the one and the same as the bermed-in area.

The small sample containers stored in the laboratory are under three (3) gallons each and are typically stored in a plastic tray that acts as secondary containment. These samples are stored inside buildings which act as further containment.

Secondary containment volume calculations are included in Appendix P. A summary of the secondary containment totals is provided below. Comparison of the secondary containment volumes to storage capacity of the various areas can be found in sections O.1.2.1 and O.1.2.2.

Location	Secondary containment volume (gallons)
Hazardous Waste Storage Warehouse - Flammable Waste Room	494
Hazardous Waste Storage Warehouse - ST6 Room	1,283
Hazardous Waste Storage Warehouse - Main Storage	3,092
Pilot Plant, excluding Bermed-in Area	12,698
Pilot Plan Bermed-in Area	2,943

A.8 POST-TREATMENT RESIDUALS

Unused waste and post-treatment residuals that remain after feasibility studies are completed are disposed of by (a) returning materials to the generator, (b) utilizing the services of waste transportation and disposal services firms, or (c) after appropriate on-site pretreatment to ensure conformance with wastewater discharge criteria, disposal in the Village of Rothschild sewer system for treatment. A sewer form, which is provided in the WAP (Appendix F), has to be filled out and approved by either the EHS manager, Laboratory manager, or Pilot Plant manager before disposal can be conducted to ensure that the waste can be properly sewered This process is discussed in section G of the WAP (appendix F).

A.9 FLOOD PLAN

The Facility is located within the 100-year flood plain. As required by NR 670.014(2)(k)3 and 4, the Facility has developed an Emergency Flood Contingency Plan (Appendix L) to be executed in advance of potential flooding. This plan requires and describes the steps taken in advance of expected flood conditions including the containerization and relocation of all hazardous and non-hazardous wastes from the Pilot Plant and lab to the licensed Hazardous Waste Storage Warehouse (Warehouse). The floor of the Warehouse is about 1-1/2 feet above the 100-year flood elevation published by FEMA. The total on-site quantity of hazardous and non-hazardous wastes at any time is limited to the maximum storage capacity (22,400 gallons) of Hazardous Waste Storage Warehouse.

A.10 WASTE ANALYSIS

The on-site lab is certified by the Wisconsin Department of Natural Resources (WDNR) under NR 149. The lab's activities include testing to properly characterize incoming and outgoing wastes and analysis of samples obtained during pilot feasibility study project runs. For analytical tests that are not covered by the on-site laboratory WDNR certification, testing may be completed off-site by a NR 149 certified laboratory (as required). Detailed information regarding sample receipt and waste analysis can be found in the Waste Analysis Plan provided in Appendix F. The most recent laboratory certification can be found in Appendix E.

A.11 OTHER ACTIVITIES

The previously licensed pipeline located in the utility tunnel between the Hazardous Waste Storage Warehouse and the Pilot Plant building has been disconnected and is no longer in use. The pipeline was constructed to allow the Facility to pump wastewater from the Pilot Plant to the Hazardous Waste Storage Warehouse in anticipation of a flood event. The pipeline was never used for that purpose. The only use of the pipeline was to pump groundwater that accumulated in the utility tunnel to Tank ST-6. With the pipeline disconnected, groundwater that may collect in the utility tunnel will be pumped directly to the sanitary sewer.

B. NONCOMPLIANCE WITH PLANS OR ORDERS

The Facility is wholly owned by Siemens Energy, Inc. There are no other solid or hazardous waste facilities for which Siemens is named in or subject to an order or plan approval issued by the Department. There are no other Wisconsin solid or hazardous waste facilities which are owned by persons, including corporations and partnerships, in which Siemens owns or previously owned a 10% or greater legal or equitable interest or a 10% or greater interest in the assets.

Therefore, no statement is required by Siemens indicating whether all plan approvals and orders are being complied with.

C. ENVIRONMENTAL IMPACT REVIEW

C.1 RELEVANT LOCAL, STATE, AND FEDERAL APPROVALS

The Facility is not a new facility, an interim facility, nor expanding. Based on this, there was no need to include approval requirements for this renewal application. The is no local special use permit associated with the Facility.

C.2 IMPACTS OF PROPOSED PHYSICAL CHANGES

Since the Facility is an existing facility, the probable adverse and beneficial impacts already exist.

C.2.1 Terrestrial Resources

Land

The Village of Rothschild is in Marathon County, Wisconsin, with a total area of 6.90 square miles, of which 6.53 square miles is land and 0.37 square mile is water. The Site, which is located on 26.8 acres of land with a latitude of 44.878175 degrees North and a longitude of 89.635582 degrees West, is in Section 26, Township 28N, Range 07E.

The immediate area around the Facility is a mixture of land uses. The area to the north and east of the Site is mainly residential, with some light commercial development. Zimpro Park, owned by the Village of Rothschild, is located immediately north of the Site. The area to the south of the Facility is forest and scrub brush, which is currently undeveloped. A whey processing plant is located approximately 4,000 feet south of the Facility. West of the Facility, the land is used for light density residence, agriculture, and forest.

The WDNR Natural Heritage Inventory (NHI) identifies Township 28N, Range 07E as having northern mesic forest, northern sedge meadow and shrub-carr as historic landcover. Northern mesic forest forms the base for other land coverage in northern Wisconsin with sugar maple the dominant tree type. Northern sedge meadow is dominated by sedges and grasses and occurs in depressions where there is groundwater movement and internal drainage, on the shores of some drainage lakes, and on the margins of streams and large rivers. Shrub-carr is a wetland community defined as having few trees and greater than 50% cover of shrubs.

The WDNR NHI also identifies Township 28N, Range 07E as a possible location for two Wisconsin Special Concern plants. Missouri Rock-cress can be found in soil pockets on acidic cliffs. Drooping Sedge can be found in sedge meadows.

The present land use at the Facility is the same as the intended use following relicensing of the Facility. As the Facility has already been constructed, there will be no additional impact to the land coverage.

Wildlife

The WDNR NHI identifies Township 28N, Range 07E as a bird rockery or nesting area. The WDNR NHI identifies American Bittern is a Special Concern bird species in Wisconsin which can be found in shallow marshes, meadows and wetlands of many sizes but prefers large open marshes and meadows. During the breeding season, it nests in areas with thick, emergent vegetation like cattails, sedges, reed, and bulrushes. The Acadian Flycatcher, a State Threatened bird, prefers to nest in lowland deciduous forests and heavily wooded hillsides. The Peregrine Falcon, a bird listed as Endangered in Wisconsin, prefers relatively inaccessible rock ledges on the sides of steep bluffs. As the Facility has already been constructed, there will be no additional impact to these nesting areas.

The WDNR NHI identifies Township 28N, Range 07E as possible habitat for the Blanding's turtle, a Species of Special Concern in Wisconsin, and Wood turtles, a Threatened Species in Wisconsin. Blanding's turtles utilize deep and shallow marshes, shallow bays of lakes and impoundments where areas of dense emergent and submergent vegetation exists and sedge meadows and wet meadows adjacent to these habitats. Wood turtles prefer rivers and streams with adjacent riparian wetlands and forage in shrub-carr habitats. As the Facility has already been constructed, there will be no additional impact to the turtle-preferred habitat.

C.2.2 Water Resources

Natural contours exist to hold back flood waters until they reach an elevation of 1150 feet (Figure 14, Appendix A). The site has been graded to facilitate movement of storm water to the storm sewers, although the porosity of the sand underneath the site minimizes the volume of storm water.

C.2.3 Flood Plain

The Facility is located completely within a 100-year flood plain as determined by a Federal Flood insurance study. Copies of the flood plain maps for the Village of Rothschild (555577C) and Marathon County (550245-0375B) are included in Appendix A, Figure B-3. The flood plain elevation is approximately 1158.6 feet MSL (as determined by the WDNR and US Army Corps of Engineers in 1990 per the Rothschild Village Clerk on October 13, 2005). Special flooding factors, which might result in wave action or washout at the site, were investigated.

The floor of the Hazardous Waste Storage Warehouse is located at an elevation of 1160.3 feet MSL. This is 1½ feet above the 100-year flood elevation. The berm surrounding the warehouse is composed of compacted fill, which was carefully selected to prevent the incorporation of rocks and organic material. The berm extends outward 15 feet from walls of the building. The slope of the berm was kept to a 1-foot rise per 3 feet of run. The fill was covered with a 6-inch layer of topsoil and sodded to prevent erosion. The lawn is maintained throughout the growing season.

Since all hazardous and non-hazardous waste will be removed from the Pilot Plant and moved to the Hazardous Waste Storage Warehouse prior to intrusion of flood waters, no analysis was made of the hydrodynamic or hydrostatic forces acting on components within the Pilot Plant. A detailed analysis of the hydrodynamic and hydrostatic forces acting on the storage warehouse was made and is included in Appendix B – Flood Scour Evaluation. This analysis clearly shows that wave action is not a significant problem and that the velocity of the floodwaters near the storage warehouse is below the velocity required to initiate washout. The hydrodynamic analysis indicates that the foundation can withstand the expected forces.

There is no additional construction scheduled at the Facility. As the Facility has already been constructed, the relicensing will not impact the flood plain.

C.2.4 Air Resources

The potential for damage from air emissions is very small. Waste containers are kept closed when not adding or removing material. Marathon County is defined as an attainment area for all National Ambient Air Quality Standards. The Facility is a minor source of air emissions and maintains compliance with state air operating permit 737053130-ROPA.

In general, the atmospheric characteristics of the Rothschild/Wausau area include a prevailing wind from the northwest. The average wind speed is highest in the spring. Conditions that would influence particulate emission and dispersal of gases also include humidity and precipitation. Average relative humidity in mid-afternoon is about 60 percent with humidity higher at night. Average humidity at dawn is about 80 percent. Annual precipitation is about 32 inches with approximately 23 inches, or 70 percent, occurring April through September.

C.3 SOCIOECONOMIC IMPACTS

The Village of Rothschild has portions of Interstate 39 (I-39) and Business Highway 51 going North/South along the West side of the Village and Highway 29 going East/West along the North edge of the Village. Dominant employment sectors include public administration, health care, manufacturing, and retail trade.

According to the U.S. Census Bureau's 2012-2016 American Community Survey (ACS), the total population within a one-mile radius of the Facility, the study area, is 1,103 of which 94% are white. Since the 2000 U.S. Census, the general population has decreased by 15.0% and the white population has decreased by 5.1%. The population of under 18-year-olds is slightly lower (18%) than the state of Wisconsin (22.6%) but the population older than 65-year-olds is higher (20.3%) than Wisconsin (15.2%). The median household income for the study area was $49,483, compared to the state of Wisconsin's median of $54,610. Of the 502 homes within the study area, 88.1% are single family detached homes compared to 74.4 % in the County and 66.6% in Wisconsin.

C.4 FEASIBILITY AND NEEDS ANALYSIS

The Facility is looking to continue current operations and not looking for expansion. A feasibility and needs analysis is not needed.

D. GROUNDWATER PROTECTION

Additional information regarding protection of groundwater, including a groundwater monitoring plan, is required for regulated units. A regulated unit is a surface impoundment, waste pile, land treatment unit, or landfill. The Facility is a storage facility, not a regulated unit; therefore, a groundwater monitoring plan is not required.

E. CORRECTIVE ACTION AND SOLID WASTE MANAGEMENT UNITS

All hazardous and non-hazardous waste activity takes place within the Pilot Plant or the Hazardous Waste Storage Warehouse. There have been no reported spills or releases on site associated with hazardous waste activity. These facilities have secondary containment to prevent the migration of hazardous waste to the soil and groundwater. Therefore, it is not necessary to sample the soil, groundwater, strata, or water on the site. In 2014, the containment area within the Pilot Plant was rebuilt. Samples taken below the concrete containment area indicated that no impacts were identified from waste activities in the Pilot Plant. A description of the rebuilt bermed-in area and discussion on containment capabilities can be found in Section A.7. (page A.10)

There are waste activities associated with the operations on the production side of the business that are not under the scope of this FPOR and the licensed hazardous waste storage operations at the Facility.

E.1 SOLID WASTE MANAGEMENT UNITS (SWMU)

E.1.1 Current and previous SWMUs

There has never been a release of hazardous wastes or hazardous constituents from any existing or historical SWMU's at the facility

a) The following areas are currently in use as SWMUs at the Facility:

- Hazardous Waste Storage Building (detailed information provided in Section O) – operating since the early 1980's
- Pilot Plant – waste storage cabinets (small container storage) and diked containment area (detailed information provided in Section O) – operating since at least the early 1980's.

b) The following areas have been historically identified as SWMUs at the Facility:

- A subsurface pipe was located within a utility conduit connecting the Pilot Plant to the Hazardous Waste Storage Building that could allow fluid to be transferred between the Hazardous Waste Storage Building and the Pilot Plant, in the case of an emergency such as a flood. Electrical wires and other utilities are also contained in the conduit. The waste transfer pipe was never used to convey hazardous waste between the buildings. Groundwater that seeped into the utility conduit would occasionally be pumped out to a tank located in the Hazardous Waste Storage Building (former hazardous waste storage tank ST-6). The waste transfer pipe was removed from service in 2018. The pipe was cleaned and formally delicensed. It has been physically disconnected at both ends and the ends of the pipe were capped and sealed. Therefore, the pipe is no longer in use. Groundwater that accumulates in the utility conduit is pumped to the sanitary sewer.
- Storage tank located outside directly adjacent to the east wall of the Pilot Plant. The storage tank (designated as ST-7) has a nominal capacity of 4,200 gallons and had a licensed storage capacity of 3,780 gallons. The tank was delicensed in 2021. The tank was last used pre 1996 and, other than water, only ever contained sewage sludge.
- Feasibility study equipment associated with solid and hazardous waste systems (WWTU's), including tanks, piping, reactor vessels, pumps, and valves. This equipment only holds waste materials during feasibility studies and is cleaned and purged before and after each use. Since the Pilot Plant operates as a research

facility, the Facility must ensure that the systems are fully purged prior to and after each feasibility study to avoid interferences between test batches. This equipment is used inside of the Pilot Plant building (a current SWMU).

- Testing laboratory has bench-top testing equipment that is used for small bench-scale feasibility studies. The equipment only holds waste materials during on-going feasibility studies and is cleaned and purged before and after each use. The volumes used for the bench-scale feasibility studies of hazardous waste is typically under three (3) gallons. Since the laboratory operates as a research facility, the Facility must ensure that the systems are fully purged prior to and after each use to avoid interferences between test batches.

E.1.2 Wastes Managed in the SWMUs

Due to the nature of research and testing activities at the Facility, specific waste characteristics are variable for the wastes stored on site. The Part A form (Appendix J) lists the various types of hazardous wastes that may be considered for acceptance. The Facility can receive wastes from a wide variety of industrial sources for feasibility studies. As stated before, much of the feasibility studies are performed on non-hazardous wastewaters.

Hazardous waste feasibility studies in the WAO and ZEO systems is primarily performed on waste caustic solutions (D002) which contain high levels of long-chain organic compounds and may also include high concentrations of sulfides or cyanide (D003). These wastewaters are not amenable to conventional biological treatment systems without pre-treatment as provided by the WAO and ZEO systems. The organic compounds will present a high Chemical Oxygen Demand (COD) that can overwhelm a typical biological aeration system; likewise, the high pH, and sulfide concentrations will either upset or pass-through the client's biological treatment systems. Similar listed waste streams include acrylonitrile wastewater (K011 to K014) and stripper bottom wastes from petroleum refineries. The WAO and ZEO systems neutralize the pH and fully oxidize the COD, sulfides, and cyanides to allow discharge to a biological treatment system or direct discharge to a water body.

The Facility has already provided services to the following types of industries:

- Petrochemical
- Dye manufacturing
- Pharmaceutical
- Mining
- Petroleum
- Paper production
- Organic chemicals
- Metal finishing
- Steel production

F. LOCATION STANDARDS

F.1 100-YEAR FLOOD PLAIN

As stated in Section C.2.3, the Facility is in the 100-year flood plain of the Wisconsin River. A Flood Plan has been developed and is included in Appendix L. Primarily this plan involves moving hazardous chemicals and wastes to the Hazardous Waste Storage Warehouse or to shelving, which is located at an elevation above the 100-year flood level. The Facility also takes measures to curtail or reduce inflow into the buildings by closing all entrances and placing barriers, such as sandbags along doorways.

F.2 PHYSICAL ENVIRONMENT

The unconsolidated glacial outwash deposits make up the most widely used aquifer in the region. The municipal wells for the Village of Rothschild, located more than a mile north of the site, utilize water from the unconsolidated aquifer, as do private supply wells located in the region near the Wisconsin River.

The crystalline bedrock, generally considered to be impermeable, is often used for low-capacity wells, especially for residences, in areas where the unconsolidated deposits are thinner and contain more clay.

The depth to groundwater varies across the region but is relatively shallow in the outwash plains along the river and generally increases away from the river as the general elevation increases. The depth to groundwater at the site is estimated at 10 to 20 feet. The Facility is not located in a wetland.

No releases to groundwater have been documented for the site. The quality of groundwater at the site has not been impacted by site activities. Because of this, the existing groundwater quality is anticipated to be impacted only by natural activities and potentially other activities up gradient of the site.

Contaminated sites with documented groundwater impact within about 1/2-mile of the Facility include the Amoco gas station (now a Mobil station) at 603 Grand Avenue and the Union 76 gas station at 407 S. Grand Avenue (tanks and building removed earlier in 2015). These sites are both northeast and up gradient of the Facility. Both sites are listed on the DNR GIS Registry of Closed Contaminated Sites and noted to have residual petroleum-related groundwater contamination. The documented groundwater contamination from these sites is far enough from the Facility that they do not impact the Facility. The contaminated groundwater plumes at each site are documented to extend into the roadway right-of-way. Because of the type of contamination and its tendency to degrade naturally, as well as the fact that the sites were closed by the state agency with jurisdiction, it is concluded that these sites are not expected to impact the Facility in the future.

Groundwater in the region flows toward the Wisconsin River and the few smaller streams and rivers tributary to the Wisconsin River. The direction of groundwater flow adjacent to the river can be reversed during seasons of higher river flow and lower base groundwater flow.

The Village of Rothschild well field is generally located about 1.5 miles northeast of the Facility, near the State Highway 29 and Business 51 interchange. The well field has three active wells that list recorded normal pump rates of 360,000 to 720,000 gallons per day. Two wells are registered for the former Weyerhaeuser / current Domtar plant north of the Facility. The precise locations of these wells are unknown but are estimated to be about 0.6 miles north of the Facility. The pumping rates of these wells are unknown.

The Village of Rothschild allows private well use by permit but has indicated the village is not aware of residential wells in use within the village boundaries. All the documented residential wells in Section 26 of T28N, R7E are located west of the Wisconsin River. The Wisconsin River is a hydrogeological barrier and the potable wells on the western side of the river will not be impacted by activities at the Facility.

The zoning maps are included in Appendix A, Figures B-5, and B-6.

The Facility is located adjacent to the Wisconsin River. Potable water and sewer service are provided to the Facility by the Village of Rothschild. Therefore, there is no risk to on-site employees or visitors from the groundwater at the site. Groundwater flow from the site is expected to be to the Wisconsin River based on regional mapping. Therefore, no other sites would be impacted by groundwater migration from the Facility. Because the Facility has not impacted the groundwater with its operation, the river does not receive waste constituents from the site via groundwater. Therefore, users of the river have little to no potential for health risks from the groundwater passing beneath the Facility and discharging to the river.

Potential damage or impairment by the Facility to the above-listed targets from groundwater or subsurface vectors is minor to none. Secondary spill containment areas, in addition to standardized containment measures, minimize this potential. The condition of the concrete containment is noted weekly during site inspections. When deficiencies are noted, the floor is repaired.

The topography of the surrounding area is addressed by the topographic map in Appendix A, figure B-14.

The climate at the Facility could be considered humid and continental. Summers are warm with mean temperatures of 65.5 degrees F. Maximum rainfall amounts occur during August, 4.0 inches average rainfall, and September, 4.3 inches average rainfall.

The summary of average climatic conditions in the area near the Facility is as follows (taken from Wausau FAA AP, Wisconsin, information).

Climatic Conditions

Precipitation	**Inches**
Average Annual	32.2
Average Winter (December-February) (Liquid equivalent)	3.40
Average Spring (March-May)	7.70
Average Summer (June-August)	11.80
Average Fall (September-November)	9.40

Because the Facility does not withdraw groundwater or discharge to the groundwater, the Facility does not appear to have potential to impact the quantity, quality, or direction of groundwater flow at the Facility or within the surrounding area. The Facility is extensively covered by impermeable surfaces, including buildings and pavement, which reduces the seepage of precipitation to groundwater throughout the Facility.

The areas around the buildings where tests are performed are paved and the pavement is maintained in good condition. Should a release occur that escapes a building or containment system, the pavement will prevent infiltration of much of the waste to the subsurface soils and groundwater. Such a release would likely be captured by the Facility sewer system which can be isolated from the village system so the waste can be collected and appropriately handled.

The Wisconsin River is located approximately 500 feet west of the Pilot Plant.

The most prominent surface water near the Facility is the Wisconsin River. The Facility does not discharge to the river and does not hold a WPDES permit to discharge to surface waters. Therefore, reissuance of the license for this Facility does not appear to present water quality standard issues for current or potential users of the Wisconsin River. Although this stretch of river is not on the 303d list as a State-designated impaired waterway, the WDNR currently has fish consumption advisories for the following species based upon potential contamination: channel catfish, carp, and redhorse. All other species are subject to the safe-eating guidelines that also recommend limited intake. No surface or subsurface connection from the active portion of the Facility to this waterway is known. On-site containment and maintenance of a 200+-foot buffer from the river mitigate impacts to the river during normal operations.

No impacted surface soils are known to exist on the Facility. Current containment structures and other standard operating procedures described in this document make the chances of impact to the surface soils from spills remote.

The apparent closest site with a documented soil contamination event is the Wausau Tile site at 9001 Business 51, just southeast of the Facility. However, this was an isolated incident in 2001 related to the accidental release of 100 gallons of oil to Cedar Creek. The spill was remediated. This spill did not impact the Facility. Other sources of surface water or soil contamination are not known to exist in the immediate area of the Facility.

The hazardous waste streams handled by the Facility are typically wastewaters with low to no concentration of volatile organic compounds. Residents are unlikely to come into contact with waste constituents through air emissions, such as dust or evaporative emissions. However, hazardous waste shipments are intermittent with an average of one per month or less. The Facility SOPs for handling chemical shipments also make the potential for spillage very low. Since the Facility is gated and fenced this exposure potential would be expected to be minimal as well.

The existing buffer surrounding the plant consists of a mixture of coniferous and deciduous trees that form an effective buffer area and screening effect to the surrounding residential area (north), commercial areas (east), and undeveloped areas (south).

F.3 TRAFFIC PATTERNS

Hazardous and non-hazardous waste samples and test materials are transported to and from the Facility exclusively by truck. Small laboratory characterization samples are usually delivered by small trucks (or vans) like those used by UPS. Drums or totes of feasibility study material are typically delivered by semi-trailer.

On-site transportation of hazardous and non-hazardous waste samples and test material from building-to-building is conducted by hand truck for small samples and by fork truck for material in drums or totes.

Access to the Facility is from U.S. Highway 51 (Beltline) north on Business Highway 51 approximately 1 mile, then left on W. Military Road. The Facility is located approximately two blocks west of the junction of W. Military Road and Business Highway 51. Access and internal roads and traffic patterns are shown on Appendix A, Figure B-10. The Facility has two access gates off Military Road, both entering the north side of the property. The westerly access gate is for employees and visitors only. Truck traffic through this gate is prohibited. The easterly access gate is designated for employees and deliveries. The Facility is fenced in on all four (4) sides. The west side is posted with no trespassing signs.

All internal roads and parking lots are two-way. Large truck traffic is limited to the road that lies along the east side of the Pilot Plant building to access the loading dock area on the south end of the Pilot Plant building and the loading dock on the north side of Shipping and Receiving. The loading and unloading area to the south and southeast of the Pilot Plant building is approximately 60 feet wide, which allows ample room to maneuver semi-trucks safely. Up to three semi-trailers can be loaded or unloaded without obstructing through traffic.

During normal working hours, cars are parked in designated parking lots and are seldom moved. Most employee car traffic occurs from 7:15 to 8:15 A.M. and from 4:00 to 5:00 P.M. Traffic during these times moves freely and is seldom congested. Traffic during working hours consists of an occasional fork truck moving around the manufacturing and Pilot Plant buildings and 4 to 5 small trucks making routine daily deliveries. A moderate amount of pedestrian traffic also occurs between manufacturing and the main building (10-15 people per day). Approximately two semi-trailer pickups or deliveries are made on an average day. More than 95 percent of the pickup and deliveries made at the Facility have nothing to do with the feasibility studies. Tank truck deliveries are rare. Tank-truck loads of hazardous wastes are not handled at this Facility.

Traffic volume on Military Road is light to moderate. The Facility accounts for virtually all the truck traffic on this road. Car and truck traffic as a result of the Facility's operation causes no significant traffic congestion problems on Military Road.

Traffic on Business Highway 51 is usually quite heavy. As noted on the traffic information map, Business Highway 51 is four (4) lanes north of the Military Road intersection, which relieves traffic congestion at the Military Road junction.

The Canadian National/Wisconsin Central Railroad crosses Military Road approximately 60 feet from Business Highway 51. Railroad crossing signals have been installed to warn of any oncoming trains. Visibility in both directions at the railroad junction is good. Only three or four trains use these tracks on an average day.

There are no turns across traffic lanes within the Facility property. Turns at the junctions of the two Facility driveways and Military Road may require crossing a single traffic lane. Turns at the junction of Military Road (two lanes) and Business Highway 51 (4 lanes) may involve crossing two traffic lanes.

All internal roads and parking lots are constructed of 2½ inches of bituminous concrete pavement (blacktop) consisting of 1½ inches of bituminous concrete base material covered by 1 inch of bituminous concrete surface material. The blacktop overlays a 5-inch compacted aggregate base.

All internal roads are designed to meet a load-bearing capacity of 40,000 pounds per tandem axle. The maximum allowable gross vehicle weight for semi-trailers and tank trucks in Wisconsin is 80,000 pounds, which is 40,000 pounds per tandem axle.

F.4 GENERAL FACILITY REQUIREMENTS

The Facility maintains a wide variety of various types of personal protective equipment in sufficient quantity to provide for the protection of human health during routine operations as well as during emergency situations. Detailed information on the types, amounts and locations of personnel protection equipment is contained in the Emergency Equipment section of the Contingency Plan in Appendix C.

In the event of a power outage, Wisconsin Public Service will be notified. Refer to Emergency Procedures in the Contingency Plan, Appendix C.

Hazardous and non-hazardous waste containers too large to easily handle by hand (over 5 gallons) are loaded and unloaded at the Pilot Plant or Shipping & Receiving docks using a fork truck. The Pilot Plant loading dock is constructed of concrete with a gradually sloping approach ramp that is free of bumps, holes or uneven surfaces. A steel pipe railing on the Pilot Plant dock guards against personnel or the fork truck running off the ramp. The ramp is kept free of ice and snow during the winter months. The location of the Pilot Plant dock location can be found on drawing B-31 and the location of Shipping and receiving in drawing B-10. Dimensions of the Pilot Plant Loading dock can be found on drawing B-28, Section C-C.

Trucks are spotted against the loading dock bumpers, wheels are chocked, and the dock board is properly positioned prior to commencing any loading or unloading activities.

Only trained personnel are authorized to operate fork trucks. Fork truck drivers are required to report any spills immediately to the primary emergency coordinator or Pilot Plant supervisor. Spill control equipment and personnel are immediately available in the Pilot Plant area to handle any spills that may occur.

Upon completion of loading or unloading operations, the loading dock and surrounding area is inspected. Waste loading/unloading areas where hazardous and non-hazardous wastes are handled are inspected for spills, leaks, or deterioration that could cause or lead to environmental damage or threaten human health.

G. WASTE ANALYSIS PLAN REQUIREMENTS

Due to the nature of the Facility research and testing activities, specific waste characteristics vary.

Procedures described in the Waste Analysis Plan are used to ensure waste received is what was expected and manifested, used to determine waste storage requirements and to formulate the run instructions for feasibility studies. The Waste Analysis Plan describes procedures for bringing in waste to the facility, analyses performed, analytical methods, waste acceptance, and sampling methods. A copy of the Waste Analysis Plan is presented in Appendix F.

H. SECURITY REQUIREMENTS

The Facility has chosen to employ a barrier and means to control entry in lieu of a 24-hour surveillance system. The Facility is completely fenced in with an internal fence to prevent unauthorized entry to the manufacturing and waste handling areas. All wastes are stored inside locked buildings to prevent access by the public or wildlife. Access to the inner fenced area is restricted to approved employees and visitors escorted by approved employees. Designated gates and doors are equipped with card scanners that will only allow approved employees to enter. All doors will allow personnel to leave in an emergency.

The Facility is totally fenced, and access is restricted. The active portions of the Facility including the Hazardous Waste Storage Warehouse, Pilot Plant, Research Laboratories and Analytical Laboratory are completely indoors. Existing building walls and restricted access provide a reasonably secure barrier to ensure against unknowing or unauthorized entry. The location of the fencing and above mentioned buildings can be found in Figure B-10 (Site Plan) in Appendix A.

The Facility's normal operating day runs from 6:45 A.M. to 5:00 P.M. Access is restricted utilizing a fence and locked doors. Employees utilize card readers to gain access to the Facility either through locked doors or gates.

Visitors are required to enter through the main entrance on the west side of the Facility and cannot gain access without an employee guide and signing in. A logbook is maintained of all visitors and visitor passes are issued. Visitors are not allowed to enter the Facility unless an employee of Facility escorts them. Escorted visitors are not allowed to enter active portions of the Facility (Pilot Plant or laboratories) without prior approval of the area supervisor.

Deliveries by truck to the shipping and receiving area enter through a gate on the East side of the Pilot Plant. The employees working in the area effectively control entry of unknowing or unauthorized personnel into an active portion of the Facility. Pilot Plant and laboratory personnel are instructed to immediately escort any unauthorized or unknowing individuals entering the active portion to the receptionist desk at the main entrance to determine the nature of their business and the appropriate person to be contacted for assistance.

Entry to the laboratory areas is restricted to qualified employees using card readers. During off-hours (before 6:45 A.M. and after 5:00 P.M.) and during weekends and holidays all entrances to the main Facility are locked. The main gate is electronically locked, and entry is allowed only with the use of an employee ID card. All employees requiring access outside of business hours have a copy of this key, as well as the Rothschild Police Department. The employees' gate is padlocked at the end of working hours each day and the only persons with the key are the Rothschild Police Department and the maintenance supervisor.

On occasion, 24-hour runs are conducted in the Pilot Plant area. During these periods only one or two doors are unlocked to the Pilot Plant building. All other entrances to the building remain locked. Pilot Plant personnel on duty control the unlocked entrances at all times.

All entrances to the Hazardous Waste Storage Warehouse always remain locked. Only authorized employees have access keys or cards. Keys to the warehouse are never loaned out. Warehouse door locks engage every time the doors are closed; therefore, doors remain locked even when authorized personnel are working inside. The overhead door is never left open unless an authorized person is present to guard against unknowing or unauthorized entry. All outside doors to the Pilot Plant, Hazardous Material Storage Warehouse and the analytical labs have signs with the legend, "Danger—Unauthorized Personnel Keep Out."

All outside entrance doors to the Pilot Plant bear the following signs:

STOP - Restricted Area Authorized Personnel Only
Caution - Eye Protection Required

Both outside doors to the Hazardous Waste Storage Warehouse bear the following signs:

Danger - Authorized Personnel Only
Notice - Safety Glasses Required Beyond This Point

The inside main entrance to the Pilot Plant bears the following sign:

Danger - Unauthorized Personnel KEEP OUT
Caution - Eye Protection Must be worn in this Area
Notice - No Eating, Drinking or Smoking in This Area

West main entrance door to the Analytical and Research Laboratories bears the following signs:

Danger - Unauthorized Personnel KEEP OUT
Eye Protection Required in Laboratories
Notice - No Food or Drink in This Area

The two main entrance doors from the hallway into the inorganic analytical laboratory bear the following signs:

Danger - Unauthorized Personnel KEEP OUT
Eye Protection Required in this Area
Notice - No Food or Drink in This Area

The main entrance double door to the Inorganic Laboratory also bears this sign:

Do Not Enter This Room When Warning Light Is On

The southern outside entrance to the analytical and Research Laboratories bears the following signs:

Eye Protection Required in Laboratories
No Admittance Employees Only
Vendors & Visitors Must Register at Main Office
No Smoking in Laboratories

All the above signs are in English and are legible from 25 feet. All signs are clearly visible to anyone approaching the active portions of this Facility.

I. GENERAL INSPECTION REQUIREMENTS

The Facility conducts routine inspections to ensure that all equipment, devices, and systems vital to prevent, detect or respond to environmental or human health hazards are properly maintained. Inspections include monitoring equipment, safety and emergency equipment, security devices, container storage, and secondary containment systems. Waste loading/unloading areas, container storage areas and other areas where hazardous and non-hazardous wastes are handled are also inspected for spills, leaks, or deterioration that could cause or lead to environmental damage or threaten human health.

Table 1 lists the inspection schedule. This schedule lists the equipment, structures, and areas subject to inspection, specific items to be inspected, inspection procedures or types of problems to look for and frequency at which inspections should be conducted. Note that inspections may be combined with other Facility checks for operational efficiency and/or performed on a more frequent schedule than listed. Inspections will be documented using forms or logs and will include the date and time of the inspection, name of the inspector(s), observations and date and description(s) of action(s) taken to correct any issue(s). Records will be kept for at least three years. Examples of forms that may be used to documents inspections are included in Appendix G.

J. CONTINGENCY PLAN REQUIREMENTS

The contingency plan describes the actions Facility personnel must take in response to fire, accidental release of hazardous waste/chemical spill or release, bomb threat, or flood to help minimize hazards to human health and the environment. The Contingency Plan may be implemented for circumstances that could lead to the development of incidents that may result from equipment failure, weather events or other occurrences. A copy of the Facility Contingency Plan is included in Appendix C.

The Plan will be reviewed at least annually and will be updated as necessary.

K. PERSONNEL TRAINING

The training program covers individuals directly responsible for hazardous and non-hazardous waste management activities including hazardous waste handling and shipping, feasibility study and characterization testing, and storage in the Pilot Plant and Hazardous Waste Storage Warehouse. The training program is designed to provide operators with the knowledge to be able to operate and maintain the facility in a safe manner and in compliance with hazardous waste requirements.

The Facility has identified four job descriptions for personnel that handle hazardous and non-hazardous waste within the facility. A description of job duties related to these activities is provided below.

1. Hazardous material handlers load and unload shipments, transport drums, totes and other containers between the loading docks, the Pilot Plant and the storage building. Personnel in this grouping are trained in the proper handling of containers and their role in identifying and reporting spills to the emergency coordinator.

2. Tier 1 Pilot Plant/R&D personnel are responsible for setting up and running WWTU or Treatability study equipment. They receive training relative to the marking of containers, proper management of the hazardous and non-hazardous waste within the Pilot Plant and Storage building and are part of the emergency response team.

3. Tier 2 Pilot Plant/R&D personnel receive additional training above what is required for Tier 1 Pilot Plant/R&D personnel. This includes RCRA and the proper shipping of hazardous waste and hazardous materials. This training would also include the proper procedures for importing hazardous waste from a foreign country. Typically this group are managers from the R&D department and are responsible for the other Pilot Plant/R&D personnel (Tier 1), proper operation of Feasibility Study equipment, and ensuring any waste is received and managed properly within the facility. They, along with the EHS manager, can sign off on sewer forms.

4. The fourth job description is the EHS manager who oversees the management of the environmental and safety programs at the Facility. The EHS manager is responsible for ensuring that all pertinent training is performed and records of training are maintained. The EHS manager does not necessarily perform all of the training themselves but is responsible for scheduling the training and ensuring it is completed in a timely manner. Inspections at the Facility are the main responsibility of the EHS manager with the personnel in group 3 providing back up if the EHS manager is unable to perform the inspections.

Training requirements are met with a combination of internal classroom training performed by qualified personnel or with the use of qualified outside vendors. The internal classroom training will consist of an annual review of the FPOR, WAP, Contingency Plan, Flood Plan, RCRA (for Tier 1 R&D), Chemical Hygiene Plan, and review of any associated forms and procedures. Classroom training will also be conducted whenever significant changes are made to the FPOR. The Facility contracts training classes with qualified outside vendors to conduct the Hazardous Waste Operator Training (HAZWOPER), DOT, IATA, and RCRA training. Any new employees hired or transferred into an affected position shall be given introductory and annual refresher classroom training within six months of the effective date of their employment or transfer. New employees will not be allowed to work in unsupervised positions until they have completed the applicable training requirements of this section.

Internal training performed covers all procedures and policy's, put forth in the Facility's FPOR/WAP/Contingency Plan/Flood Plan/Chemical Hygiene plan documents, in relation to the safe and proper handling, labeling, and storage of hazardous/non-hazardous waste as well as hazardous materials. This includes all forms related to the receipt, storage, and disposal of these activities. Personnel performing inspections or providing internal training receive additional formal outside vendor training.

Project run instructions for each feasibility study are developed which includes the test plan, the waste being tested, safety considerations, emergency procedures, and overall set up of the treatment unit. This plan is shared with all personnel involved in the study before any testing is performed. Proper handling of the waste, in respect to safety as well as containment, is reviewed with all pertinent personnel.

General Contingency Plan training is provided to everyone that works at the facility. More detailed Contingency Plan training is also provided to personnel that could possibly be working in the waste treatment unit or storage areas. This would include personnel that work for Siemens subcontracted property management or any other outside vendors such as electricians.

Training requirements for each job description are presented in Table 2.

The following documents are maintained at the facility. Documents that detail the job title for each position that relates to hazardous and non-hazardous waste management, names of employees filling those roles, written job descriptions for the job titles, description of introductory and continuing training required for each job title, and records that the training was completed per NR 664.0016 (4). Per NR 664.0016(5) training records on current personnel will be kept until closure of the facility. Training records on former employees shall be kept for at least 3 years from the date the employee last worked at the facility. Personnel training records may accompany personnel transferred within the company.

L. CLOSURE PLAN REQUIREMENTS

L.1 CLOSURE PLAN

The closure plan describes the measures that will be taken to close the active portions of the Facility if this becomes necessary. The plan only addresses the active portions of this Facility and covers only the steps required to terminate hazardous waste activity in those areas. The active, or regulated portions of this Facility are limited to the Pilot Plant and the Hazardous Waste Storage Warehouse. Hazardous waste samples handled by the analytical and research labs are exempt from the regulations, therefore, the laboratories are not included as part of this closure plan. However, to minimize the need for further maintenance, the closure plan and closure cost estimate includes provisions to dispose of a maximum of 200 gallons of hazardous waste samples that could conceivably be present in the laboratory areas at the time of closure. The proposed method of disposing of these samples would be lab packing in open top steel drums over packed with vermiculite.

The Facility maintains a copy of the approved closure plan and all revisions to the plan on-site. The owner of the Facility will notify the Wisconsin DNR at least 180 days prior to the expected date of closure. The Facility has no established or estimated closure date.

The Facility's closure cost estimate, presented in Appendix H, has been based upon outside companies performing all of the activities presented in section L.1.4.1. The closure plan and cost estimate include the disposal of both hazardous and non-hazardous solid wastes on site. Section L.1.3 provides estimated waste inventory at time of closure. It is not reasonably anticipated that closure activities will involve contaminated soil. The remote potential for significant soil contamination at this Facility does not warrant its inclusion as part of the closure plan. The ten percent contingency included in the financial responsibility for closure is considered more than sufficient to cover any recovery and disposal costs incurred should a small isolated release to the soil occur during closure.

L.1.1 Closure Performance Standard

The provisions of this closure plan ensure that the Pilot Plant building and the Hazardous Waste Storage Warehouse will be completely devoid of hazardous waste and all equipment and structures that remain will be free of hazardous waste residue. Upon completion of closure, post-closure maintenance or controls will not be necessary because no significant amount of hazardous waste will remain in these areas. If, during the course of closure, spills or leaks occur or evidence of earlier spills, leaks or releases are discovered they will be cleaned-up and, if necessary, samples will be taken and analyzed to determine the extent of contamination if such releases occur or have occurred on the ground (unpaved soil). Hazardous waste releases to the ground, surface waters or the atmosphere would be extremely unlikely during the course of closure because virtually all decontamination and hazardous waste handling has been and will be conducted within the confines of the Pilot Plant or the storage warehouse.

L.1.2 Partial Closure and Final Closure Activities

There is no intention to completely close any of its existing facilities in the foreseeable future nor is there any physical or environmental basis for establishing a specific closure date. However, if future circumstances or decisions result in termination of hazardous waste activity, closure of the warehouse and the Pilot Plant will be implemented. The Facility does not anticipate partial closure of one area without the other. Final closure will therefore be conducted in accordance with section L.1.4.1 when circumstances require closure or when the decision is made to terminate regulated hazardous waste activity.

L.1.3 Maximum Waste Inventory

During normal conditions, hazardous waste inventory facility wide will not exceed 20,112 gallons. This includes containerized storage, laboratory samples, and waste in the process of being treated.

During flood conditions, containers of hazardous and non-hazardous waste in the Hazardous Waste Storage Warehouse will not exceed 22,400 gallons. Therefore, the total facility wide inventory of containerized hazardous and non-hazardous waste, Treatability Study samples, Lab samples, and waste in the process of being treated in WWTU's will be maintained under 22,400 gallons. The maximum quantity of hazardous waste stored in small containers in the laboratory will not exceed 200 gallons. Estimated waste inventories provided below are based on maximum licensed storage amounts provided in section A.6. The breakdown of waste classifications are estimated based on historical data of wastes brought into the Facility over the last 10 years and wastes expected to be received during the next 10 year period.

20,112 gallons of Hazardous waste (maximum storage capacity) consisting of the following:

1,100 gallons (4-275 gallon totes) of D001 waste

200 gallons of small (1 Liter) haz waste samples, 5 gallons D001 and remainder D002, D003, D026

Remaining 18,812 gallons of hazardous waste, typically having codes D002, D003, and D026

2,288 gallons of non-hazardous waste:

Assuming we are at maximum capacity for hazardous waste and that the Facility cannot store more than a combined capacity of 22,400 gallons of Hazardous and non-hazardous solid wastes, the facility could store an additional 2,288 gallons of non-hazardous solid waste to be disposed of also. This waste is typically from later stages of biological treatment processes.

The majority of the Hazardous waste (D002, D003, and D026 classification) is high pH, high in sulfides, and cresols. This type of waste has and is expected to continue to make up the bulk of the wastes received at the Facility. The closure plan costs and clean-up activities provided in Appendix H and Section L of this document are based on these estimates.

L.1.4 Inventory Disposal, Removal and Decontamination of Storage Areas

Section L.1.4.1 outlines the procedure to be used to remove waste from the site and the process to ensure the Pilot Plant and Hazardous Waste Storage Warehouse has been properly decontaminated.

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L.1.4.1 Closure of Containers, Hazardous Waste Storage Warehouse, and Pilot Plant

Under the current license restrictions, the Facility is limited to 20,112 gallons of hazardous waste storage in containers in the Hazardous Waste Storage Warehouse and Pilot Plant. Containerized storage of hazardous and non-hazardous waste at the facility will not exceed 22,400 gallons, the amount that can be stored in the Hazardous Waste Storage Warehouse during a flood event. Considering these storage limitations, for closure purposes there is estimated to be at least 2,288 gallons of containerized non-hazardous solid waste to be disposed of. As the Facility will not accept or

store hazardous or non-hazardous waste in other than DOT approved containers, the same containers used to store the waste will also be used for shipping purposes if necessary.

Upon notification to the Wisconsin DNR that closure is anticipated (at least 180 days prior to the expected closure date), the Facility will begin reducing its hazardous waste inventory by shipping as many hazardous waste samples as possible back to the original generators (clients). (They are manifested if the client is licensed to accept them; otherwise they are usually shipped to a third party TSD such as Veolia). It is anticipated that some of the hazardous waste inventory can be removed in this manner. It is likely that a substantial amount, if not all, of the waste inventory that remains could be treated in the Pilot Plant WWTU's and discharged to the sewer in accordance with the local sewer discharge limitations. These waste inventory removal methods will be implemented during the 180-day period prior to the established closure date and likely will remove virtually all hazardous waste from the site. Within ninety (90) days of the closure date, any waste not able to be treated in a WWTU and sewered according to discharge requirements will be shipped to an approved hazardous waste disposal facility off-site. This would include the possible 200 gallons of small (1 L) lab samples of hazardous waste.

When the containerized hazardous and non-hazardous waste inventory has been either treated and sewered or sent offsite for disposal, the Hazardous Waste Storage Warehouse and Pilot Plant will be decontaminated. Virtually all of the wastes handled, treated or stored by the Facility are aqueous solutions or slurries. The generally accepted method for decontaminating equipment and structures encountering this type of material is rinsing with water or washing with detergent and water. Unless there is reason to believe that water is not an appropriate solvent, decontamination of equipment and structures will consist of washing contaminated surfaces with soap and water and thoroughly rinsing surfaces with fresh water. Special decontamination solvents other than water will not be used unless necessary.

All external surfaces where contamination is evident will be washed. Contamination on exposed surfaces of equipment and structures shall be determined by visual inspection. Absorbent material (e.g. spill absorbent, insulation, etc.) showing signs of contamination will be placed in plastic lined drums for disposal. All other equipment and structures showing signs of contamination will be cleaned. The entire floor surface and portions of drum racks, cabinets, equipment, and walls where visible contamination is evident will be washed with soap and water and hosed down with fresh water in both storage areas. All wash and rinse water will be collected for analysis before disposal.

In the Hazardous Waste Storage Warehouse the wash/rinse water will be collected through the floor drains and sump and collected in tank ST-6 (Appendix A, figure B-29 and B-24). This will also serve to flush out the floor drain lines, sump, and sump pump. When this is completed, an additional 50 gallons of fresh water will be flushed through each of the warehouse floor drains as a final rinse. The wash/rinse water collected in ST-6 will then be pumped into 275 gallon totes. In the Pilot Plant the wash/rinse water will be collected in the trenches (Appendix A, B-31) and pumped into 275 gallon totes. The wash/rinse water in the totes will be sampled for analytical testing.

Effective decontamination will be demonstrated when the final rinse water sample does not exceed any hazardous wastewater category standards identified in table titled "Treatment Standards for Hazardous Waste" provided in s.NR 668.40 and no visible contamination is evident in the warehouse. Unnecessary dilution will be avoided in the final rinse. At a minimum this analysis shall include pH, CN-, sulfide, and any other analyses that are applicable based on wastes treated at the facility.

It is expected that the first rinse will not exceed any sewer ordinance or hazardous wastewater category standards identified in table titled "Treatment Standards for Hazardous Waste" provided in s.NR 668.40 and will be able to be sewered. Rinsing will be repeated, if necessary, until the rinse water sample does not exhibit any hazardous waste characteristics identified above. It is standard procedure to triple rinse all tanks, transfer piping, containers, testing units and test equipment following each feasibility study project to avoid cross contamination of subsequent projects.

General safety and housekeeping policies at the Facility require that any spillage of wastes or accumulation of waste residue be immediately cleaned up when identified. Daily and weekly inspections of the storage areas include examination for contamination or leakage from waste containers. These day-to-day policies and procedures greatly reduce the possibility of contamination. In the event a rinse/wash water would exhibit hazardous characteristics identified in table titled “Treatment Standards for Hazardous Waste” provided in s.NR 668.40, it would then be disposed of at an off-site hazardous waste facility or possibly treated and sewered depending on the hazardous characteristics.

Upon completion of decontamination, all implements, and equipment used for decontamination (e.g. mops, sponges, disposable gloves, disposable garments, boots, etc.) will be placed in plastic lined drum(s) for disposal. If the analysis of rinse water indicates that the wash and rinse water collected during decontamination activities discussed previously in this section is a hazardous waste, then the drum(s) containing implements and equipment used for decontamination will also be considered hazardous and will be disposed of along with the wash and rinse water at an off-site hazardous waste disposal facility.

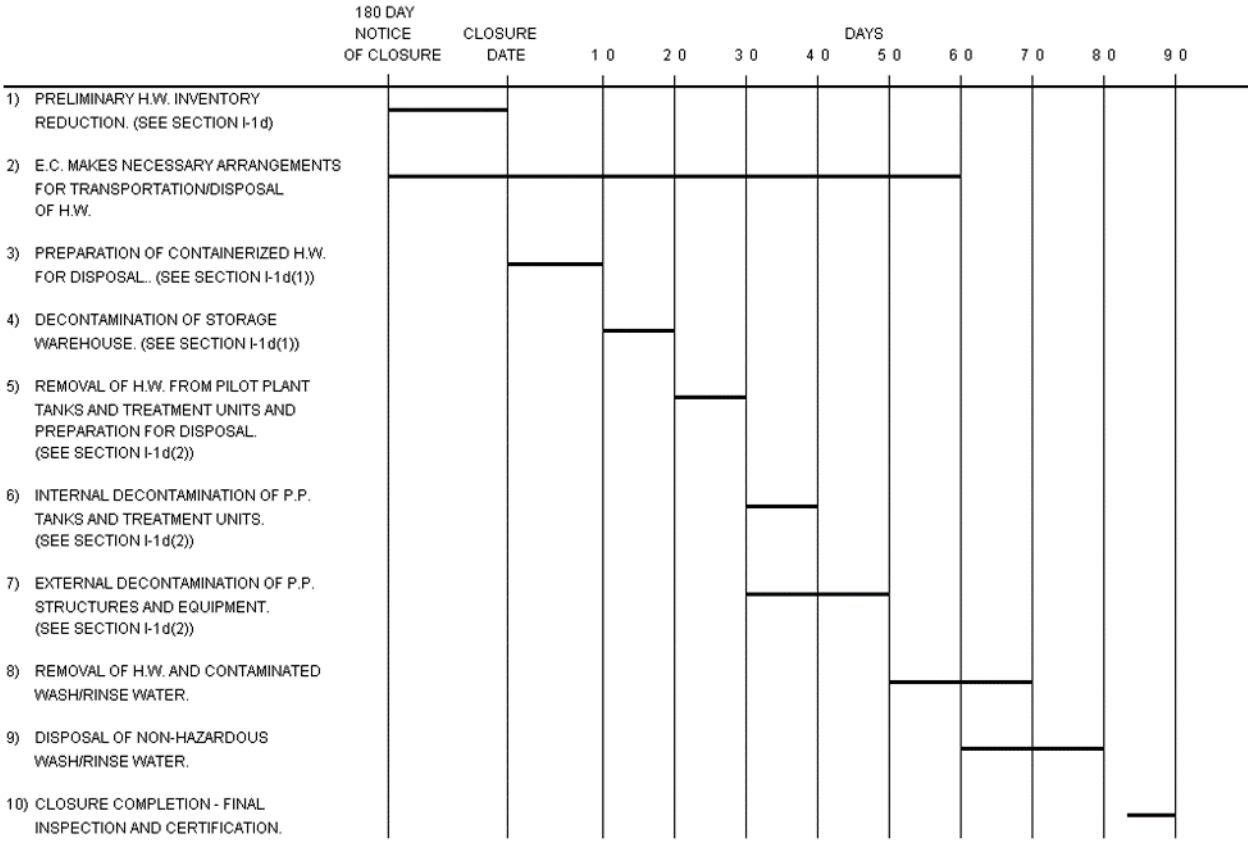
The Emergency Coordinator or Pilot Plant Manager shall be present during closure operations to ensure that the Facility is properly closed in accordance with this closure plan and all activities are conducted in such a way as to protect human health and the environment. The Emergency Coordinator shall also make all necessary arrangements for the proper transportation and disposal of hazardous and non-hazardous wastes resulting from closure. It is anticipated that the Facility’s Wisconsin licensed analytical laboratory will do all necessary sample analysis. Any analyses the Facility’s laboratory is not licensed to perform will be subcontracted to a suitable Wisconsin certified laboratory.

Within 60 days of completion of closure, the owner of the Facility will submit to the Wisconsin DNR certification both by the owner and by an independent registered professional engineer that the Facility has closed according to the provisions of the approved closure plan.

L.1.5 Schedule of Closure

The Facility has no intentions of completely closing any of its existing facilities in the foreseeable future nor is there any physical or environmental basis upon which an estimated closure date can be determined. The closure cost estimate has therefore been based on current costs and will be adjusted annually for inflation within 30 days after the anniversary of the approval date of this closure plan in accordance with NR 664.0142.

The summary schedule for the closure of the Pilot Plant and Hazardous Waste Storage Warehouse is shown below. This schedule indicates the total time required to close and the time required for each major step of the closure process. Upon completion of each major step indicated, the Emergency Coordinator and the supervising Pilot Plant engineer will conduct an inspection to determine if the work was done in accordance with the approved closure plan and closure schedule.



Being a research and test facility, the Facility only handles hazardous waste samples on a periodic basis. It is very possible to go more than ninety (90) days without receiving a regulated volume of hazardous waste at this Facility. Therefore, for closure plan purposes the date from which the ninety (90) day hazardous waste removal requirement is measured is assumed to be the closure date. It is anticipated and indicated on the closure schedule that all hazardous waste can be disposed of off-site and all closure activities can be completed within ninety (90) days of the closure date.

L.1.6 Extension for Closure Time

It is not expected that the Facility will require an extension for closure time. However, if circumstances beyond control of the Facility result in the need for more than ninety (90) days to remove and properly dispose of all hazardous waste, a written request for an extension will be filed with the Wisconsin DNR demonstrating why such extension is necessary. Since the Facility expects to be able to complete all closure activities within ninety (90) days of the closure date, it is anticipated that even if problems were encountered not more than 180 days would be required to complete closure.

L.2 POST CLOSURE

The Facility is not a disposal facility; therefore, the post closure requirements do not apply.

L.3 NOTICE IN DEED

The Facility is not a disposal facility, therefore, the Notice in Deed requirements do not apply.

M. CLOSURE COST ESTIMATE AND FINANCIAL RESPONSIBILITY

The cost estimate for closure activities is included in Appendix H.

Total Closure costs provided in Appendix H are based on all of the actions presented in section L.1.4.1 to be performed by outside personnel. The cost estimates further assume that no waste or closure residues will be treated or sewered on-site. A copy of the procedure outlined in section L.1.4.1 was provided to a representative from SET Environmental to base their cost estimate on. The representative also visited the facility and viewed the Pilot Plant and Hazardous Waste Storage Warehouse. Costs for the estimated waste disposal were obtained from Veolia North America. Waste amounts and composition that were provided to Veolia for disposal cost estimates are provided in section L.1.3. SET Environmental provided Veolia the rinsate volumes/composition anticipated from cleanup activities. The cost estimate from SET Environmental and a summary of the waste disposal costs to Veolia are provided in Appendix H. Email correspondence from Veolia regarding waste disposal costs are maintained on file. An additional cost, in the amount of 10% of the cleanup and waste disposal costs, was added to the total cost estimate to cover management costs that would be incurred by DNR personnel or a company hired by the DNR to oversee the closure. An additional 10$=% was then added as a contingency for unforeseen requirements.

A letter establishing an irrevocable line of credit is included in Appendix I.

N. POLLUTION LIABILITY INSURANCE

The Facility has obtained liability insurance for sudden and accidental occurrence in the amount of $5 million per occurrence with an annual aggregate of $8 million exclusive of legal defense costs. A copy of the certificate is included in Appendix I.

O. CONTAINERS

All hazardous and non-hazardous waste containers of 3 gallons or more in volume are stored in the Facility's on-site Hazardous Waste Storage Warehouse or Pilot Plant building.

The Hazardous Waste Storage Warehouse building is 60 feet long by 50 feet wide by 13 feet high at the eave. The floor is epoxy sealed concrete. The lower 7 feet of exterior walls are epoxy sealed cement block. The upper portion of exterior walls and the roof are insulated metal sheeting. Structural framing is steel. A 2-inch high roll curb is provided at all exterior door openings to provide secondary containment. All doors are constructed of enameled steel. The Warehouse building has no windows except for two small lights in the overhead door. Fluorescent ceiling lights provide ample interior lighting. The building has its own heating and ventilating system. The toilet is connected to the sanitary sewer; all other drains in the building are connected to a sump. Liquid from the sump can be pumped to a 1000-gallon stainless steel holding tank (ST-6) for additional spill containment volume. Both the sump and the holding tank are located inside the building. Waste container storage outside of the bermed-in area will be limited to what is needed for active feasibility studies. The contents of the tank are transferred to containers for disposal.

Within the warehouse, there is a flammable storage room, a walk-in cooler, a sump area, and a small bathroom. The sump area is isolated from the open storage area by a plastic splash curtain and a 6-inch concrete curb but is connected by drains that empty into the sump from the main storage area. A 6000 SCFM fan that draws from both the floor level and ceiling level to remove vapors that are heavier or lighter than air ventilates the sump area. The sump area also acts as a walk-in hood area that can be used for handling of ignitable, reactive, or flammable wastes. The area in which the ST-6 holding tank is located is isolated from the rest of the building by a 2-foot high concrete secondary containment wall and a plastic splash curtain. The Flammable Storage containment is separate from the main storage area as well. The remainder of the warehouse is open storage for raw materials, containerized waste, and equipment.

Pallet storage racks are used in the warehouse storage areas to allow stacking of palletized equipment and containers at 3 levels. All pallet racks are securely anchored to the floor.

Appendix A, figure B-29 is a floor plan of the Hazardous Waste Storage Warehouse showing pallet racks, Flammable storage room, bathroom, storage cabinets, holding tank ST-6 and sump area locations. The dimensions of each of the containment areas can be found in figure B-29 as well.

Small quantity (less than 3 gallons) hazardous and non-hazardous waste samples from feasibility studies are stored in stainless steel or plastic secondary containment trays in the Pilot Plant sample cabinets. Additionally, totes and/or drums used as the feedstock for feasibility studies in the Pilot Plant may be stored in the Pilot Plant bermed-in area for extended periods. When the waste is to be used for testing elsewhere in the Pilot Plant, the container will be moved to the testing location, if the entire quantity is needed. If smaller quantities are sufficient, a quantity of the waste will be removed from the drum or tote and is taken to the feasibility study area. Location of the Pilot Plant sample cabinet and bermed-in area are shown on Appendix A, Figure B-31.

All hazardous and non-hazardous waste containers at the Facility are typically managed as containers with free liquids.

NOTE: Hazardous waste samples received by the Facility for laboratory analysis/characterization testing are exempt from regulation under NR 661.0004(4). These samples are typically three (3) gallons or less. The samples would be subject to regulation if they would be taken out of the sample loop for any reason. These samples will either be consumed by the laboratory processes, returned to the customer, or excess quantities will be managed by the Facility as a hazardous waste generated by the Facility.

The Facility has implemented a self-imposed hazardous waste storage limit in containers of 20,112 gallons (366 full 55-gallon drums or 73 full 275-gallon totes). At no time during normal operation will the combined total of containerized hazardous waste, waste undergoing treatment, and hazardous lab samples exceed this amount for the entire Facility. Containers of hazardous and non-hazardous waste having a capacity of 3 gallons or more are normally stored in the Hazardous Waste Storage Warehouse unless they are required for feasibility studies conducted in the Pilot Plant building. Small quantity hazardous and non-hazardous waste samples (less than 3 gallons) are normally stored in metal sample cabinets in the Pilot Plant or the Hazardous Waste Storage Warehouse.

O.1.1 Container Inspections

Inspection requirements are discussed in Section I of this document.

O.1.2 Containment

O.1.2.1 Hazardous Waste Storage Warehouse

The epoxy cement block exterior walls act as a containment structure or curb for the storage warehouse. All joints between the cement block walls and the warehouse floor are sealed with silicone and/or epoxy paint. All joints or cracks in the cement block walls and floor are sealed with silicone sealant and/or epoxy paint. Two-inch high roll curbs (ramps) are provided at all exterior door openings to complete the main containment structure. Sealed cement block walls and a 2-inch sloped threshold (ramp) at the door opening provides separate containment for the Flammable Storage room. The ST-6 holding tank area has containment separate from that of the rest of the building as well. Secondary containment for the ST-6 holding tank area consists of the epoxy sealed cement block exterior building walls and a 2-foot high epoxy sealed cement block dike. Locations of the roll curbs, thresholds, and separate containment areas can be found in Appendix A, Figure B-29.

In accordance with sound engineering practices the containment base (warehouse floor) has several expansion joints. In addition, virtually any concrete slab is subject to a certain amount of cracking. To maintain the capability of the containment base to contain liquids, all such joints and cracks have been sealed with silicone caulking and/or epoxy paint. The containment base is routinely inspected and maintained to ensure all joints and cracks remain sealed.

To maintain imperviousness of the containment base, silicone caulk was selected and used to seal expansion joints and larger cracks. Epoxy enamel was selected and used as the overall surface coating. Both products are widely recognized as being among the best with respect to durability and resistance to chemical attack. The containment base was etched with muriatic acid prior to painting. All joints and cracks were then sealed with silicone caulk. The entire base was then given one coat of thinned epoxy enamel followed by two more coats of unthinned epoxy enamel. The cement block walls of the warehouse were given one coat of epoxy primer followed by one coat of unthinned epoxy enamel. After painting the containment base was inspected and is routinely inspected for cracks, scratches, or blisters in the epoxy coating. The enamel coating is redone when condition dictates.

The storage warehouse floor (containment base) is sloped to facilitate the draining of spilled liquids to one of the 6 PVC floor drains. After entering a floor drain the liquid flows to an unlined PVC sump chamber and is automatically pumped into a 1000-gallon stainless steel holding tank (ST-6), which is located in a separate containment area from the main warehouse. The capacity of the secondary containment for ST-6 is 1,283 gallons which is enough to contain the contents of the tank in case of a failure.

The largest containers that are normally stored in the warehouse are the nominal 55-gallon sized drums or 275-gallon totes. On very rare occasions special shipping containers of up to 330 gallons have been encountered. Hazardous and non-hazardous waste containers of over 275 gallons are not reasonably anticipated.

No more than 22,400 gallons of containerized hazardous and nonhazardous waste is stored at this Facility between the Hazardous Waste Storage Warehouse and Pilot Plant. Worst case scenario, during a flood emergency, all of the 22,400 gallons of containerized solid waste, both hazardous and non-hazardous, would be temporarily stored in the warehouse.

The Hazardous Waste Storage Warehouse containment structure capacity, not including the volume of drain lines, sump, Flammable Storage area, or holding tank, is 3,092 gallons which is well over 10 percent (2,240 gallons) of the total maximum volume of waste (22,400 gallons) in storage during a flood event. It is also larger that the volume of the largest container (330 gallons). In the extremely unlikely event that 10 percent of the maximum storage capacity of the warehouse would spill and at the same time the 1000-gallon holding tank (ST-6) would not be available, the maximum liquid depth in the containment base would be less than 2 inches. Since normal pallet height is approximately 5 inches, there would be no release to the environment and containerized waste on pallets setting on the floor would be sufficiently elevated to prevent contact with the accumulated liquids.

The Flammable Storage area also has separate containment from the main area of the Hazardous Waste Storage Warehouse. The flammable waste storage capacity, as provided in Appendix A, Figure B-29, is 2,145 gallons. The secondary containment capacity of the Flammable storage area is 494 gallons. The 494 gallon containment capacity is sufficient since the largest container that would be stored in this room would be a 330 gallon tote.

Calculations for Secondary containment volumes referenced in this section are included in Appendix P.

The storage warehouse is totally enclosed, and the floor elevation is above the 100-year flood level and is therefore not subject to precipitation run-off or flooding run-on.

O.1.2.2 Pilot Plant

The Pilot Plant may be used for feasibility studies and storage of containers when needed for these studies. The Pilot Plant has a bermed-in area with a containment capacity of 2,943 gallons that is constructed with a 6-inch concrete curb that provides hydraulic separation from the remaining portion of the Pilot Plant building. There are no drains in the bermed-in area. The bermed-in area may house feasibility study units and is used for storage of drums and/or totes before, during, and/or after feasibility studies or when shipments are first received before movement to the Hazardous Waste Storage Warehouse.

The remainder of the Pilot Plant is used for feasibility studies, including the WAO systems, and miscellaneous equipment storage. The Pilot Plant has a total secondary containment capacity of 12,698 gallons (excluding bermed-in area). The Pilot Plant containment system is constructed with curbs and foam thresholds at access/egress locations, to provide additional secondary containment. By installing thresholds with heavy duty construction adhesive and sealing the seams with silicone caulking, waste is effectively excluded from escaping the Pilot Plant building. The addition of the riser pipes in each trench drain prevents spillage from entering the sewers. Plumber's plugs are available on site and used when hazardous or non-hazardous wastes are being stored or handled in the Pilot Plant, which prevents the waste from getting into floor drains. All sewer drains are either plugged or will have stand pipes any time a hazardous or non-hazardous waste is being stored or handled in the Pilot Plant. Drum pallets and sample containment trays may also be used in the Pilot Plant for materials stored outside of the central containment area.

The proposed maximum storage capacity of hazardous and non-hazardous waste for the Pilot Plant is 6,839 gallons. The secondary containment capacities of the bermed-in area (2,943 gallons) and Pilot Plant (excluding bermed-in area) (12,698 gallons) provide sufficient containment to cover a spill well over 10% (683.9 gallons) of the storage capacity. The largest container that will be stored in the Pilot Plant would be 330 gallons. The largest tank that would be used in conjunction with a WWTU or Treatability study would be 1,000 gallons. The secondary containment of 12,698 gallons is also sufficient to provide containment for a failure of any single container or tank/treatment system.

Calculations for Secondary containment volumes referenced in this section are included in Appendix P.

The Pilot Plant is totally enclosed and is therefore not subject to precipitation. In the event of a flooding event, the Flood Plan will be implemented to minimize run-on issues.

O.1.3 Incompatible, Reactive and Ignitable Waste

The Facility normally stores and treats only aqueous wastewaters. Most hazardous wastes are characteristically hazardous for pH (pH > 12.5, D002)) or reactivity (D003), due to the presence of cyanide and sulfide compounds. The presence of ignitable wastewaters is rare. When encountered these wastewaters may exhibit the characteristic of ignitability due to volatile components present in small amounts. These volatile components may cause the waste to exhibit the ignitability characteristic even though the waste does not contain enough fuel value to sustain combustion.

The Facility does not store or treat solids that would cause fire through absorption of moisture, friction or spontaneous chemical changes.

The characteristic of reactivity (D003) covers eight (8) different properties. The Facility stores or treats reactive wastes which contain sulfides or cyanides, and which can release significant quantities of toxic gases when exposed to acidic pH conditions.

O.1.3.1 Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Waste

When ignitable or reactive wastes are handled, stored, or undergoing feasibility studies at the Facility, the following precautions are taken to prevent ignition or uncontrolled reaction.

1) Supervisors of the analytical laboratory, research laboratories and Pilot Plant are notified of the arrival of an ignitable or reactive waste by means of a sample characterization form. This form is filled out by the generator of the wastewater or the project manager and is designed to provide basic health and safety information as well as chemical and physical properties of the material. Project managers are required to relay this information to personnel working with the wastewater so that they are aware of the potential hazards.

When required, project managers will implement some or all the precautions listed below, as appropriate for the waste type, area, or type of work being conducted. Sample characterization forms, safety data sheets, Dangerous Properties of Industrial Materials and other publications are used to develop any special precautions or procedures that may be required, to protect human health or the environment.

2) No smoking is allowed anywhere in the building. No smoking signs are posted at all entrances to the active portions of this Facility.

3) When ignitable or reactive wastes are being tested in the Pilot Plant, airflow through the building is maintained with seven high capacity ceiling fans that provide general ventilation. In addition, the feasibility study feed and effluent tanks are covered and vented to the outside of the building by a separate ventilation

and collection system. Off-gas from the feasibility study testing units is also vented to the outside of the building as a precaution to prevent buildup of any toxic gases, which can be a product of the WAO process. Written operating instructions specify ventilation requirements and precautions for each project commensurate with the potential for the specific waste to release ignitable or toxic fumes. Pilot Plant technicians are provided with written operating instructions and are verbally reminded in the pre-run meeting to be watchful for any indications of ignitable or toxic fumes. These precautions are reasonably sufficient to prevent human health hazards or ignition of fumes or vapors from indirect ignition sources (i.e. hot surfaces; frictional heat; static, electrical, or mechanical sparks or radiant heat).

4) Welding, cutting, grinding or any other activity that produces sparks or uses open flame are forbidden in the Pilot Plant building when ignitable or ignitable reactive waste is being processed or handled. The Pilot Plant manager is responsible to see that work schedules do not allow incompatible work to be conducted at the same time. Pilot Plant personnel are instructed to report any unauthorized welding, cutting, grinding, etc. to the Pilot Plant manager when ignitable waste is present. Hot work permits must be filled out prior to any cutting or welding other than in the manufacturing shop.

5) Compatible containerized ignitable wastes are stored in the flammable storage room in the Hazardous Waste Storage Warehouse. Secondary containment for the flammable storage room is separate from the rest of the warehouse to avoid the possibility of incompatible wastes commingling in the event of a spill. Ignitable wastes are not brought to the Pilot Plant building until just prior to the start of a Pilot Plant run. Upon completion of pilot testing ignitable waste is immediately returned to the flammable storage room until it is shipped back to the client or disposed of. At no time are incompatible wastes stored next to each other.

All electrical equipment and wiring in the flammable storage room is explosion proof to prevent the ignition of flammable vapors. The room has a 500 SCFM ventilation system that runs continuously to prevent the build-up of toxic or flammable fumes or vapors. A Combustible Gas Detection System also monitors the special storage room continuously for explosive vapors.

All containers of hazardous waste including ignitable and reactive wastes always remain securely covered during storage. If an ignitable or reactive waste container must be opened for sampling purposes in the warehouse it is moved to the walk-in hood area, which is the same as the sump area (Appendix A, Drawing B-29). A 6000 SCFM fan that draws from both the floor level and ceiling level to remove vapors that are heavier or lighter than air ventilates the walk-in hood area. This ventilation system is turned on before the container is opened to quickly remove any ignitable or toxic fumes that may be released. The massive volume capacity of the walk-in hood area ventilation system precludes the possibility of any flammable vapors reaching their lower explosive limit.

During characterization testing and feasibility studies, samples are monitored visually for unusual color changes, unexpected layering, gas evolution, exothermic reactions, and any other physical changes. These changes are recorded in the project logbook and follow up occurs to determine the cause and possible impact on feasibility study tests.

O.1.3.2 General Precautions for Handling Ignitable or Reactive Waste and Mixing of Incompatible Waste

The Facility maintains the policy of not processing incompatible wastes in the Pilot Plant in the same unit. If however, during the course of a research project it is necessary to combine incompatible material (i.e. acidify a sulfide bearing

waste) detailed written instructions are provided that include special precautions to be taken, health and safety hazards involved, personal protective requirements, ventilation requirements, first aid procedures in the event of an accident and special emergency procedures when required. This information is also covered verbally with the technicians during the pre-run meeting. Prior to combining incompatible material, the project supervisor checks to see that all necessary precautions have been taken as specified in the operating instructions and supervises the combination. As indicated in the Waste Analysis Plan (Appendix F), if a research project requires incompatible wastes or materials to be combined, small-scale laboratory tests will be conducted first to ensure that the combination can be conducted safely.

Incompatible waste or material may be processed in separate treatment units in the Pilot Plant at the same time. If this is being done a safety review will be completed to ensure that the wastes will not come into contact and that all treatment systems can be run safely.

O.1.3.3 Management of Ignitable or Reactive Wastes in Containers

The Hazardous Waste Storage Warehouse, loading docks, Pilot Plant and laboratories are all located a minimum of 125 feet from The Facility's property line. Ignitable or reactive wastes are not handled, stored or treated at any other location within the Facility boundaries.

Management procedures and precautions for ignitable or reactive wastes in containers are further detailed in other sections of this document. In summary these management procedures and precautions include:

1) A flammable storage room in the Hazardous Waste Storage Warehouse having separate secondary containment for compatible ignitable waste containers.
2) Stainless steel secondary containment drum trays (two (2) 55-gallon drums per tray) for separate waste storage.
3) Labeling of all waste containers to prevent accidentally mixing incompatible wastes. Labels also convey hazards associated with each waste.
4) A waste analysis plan that provides a method of assuring compatibility of wastes with containers. Procedure can be found in the WAP (Appendix F, Section K).
5) Keeping all hazardous and non-hazardous waste containers closed, except when waste is added or removed.
6) Providing basic information about each waste (sample characterization form) to Pilot Plant and laboratory personnel. Special detailed written precautions and procedures (operating instructions) are provided for feasibility study Pilot Plant runs on hazardous and non-hazardous waste.
7) Controlling the use of smoking materials.
8) Providing sufficient general and local ventilation.
9) Controlling any activities that generate ignition sources when ignitable wastes are being handled.
10) Not processing incompatible wastes in the same treatment unit in the Pilot Plant at the same time unless certain precautions are taken. See section O.1.3.2 and Section L of the WAP.
11) A waste analysis plan that provides a method of assuring that incompatible materials can be combined safely when required. Special written instructions and supervision is provided when incompatible materials must be combined. (WAP, Appendix A, Section L)
12) Storing hazardous and non-hazardous waste containers properly (i.e. on pallets, in appropriate pallet storage racks by hazard class, maintaining required aisle space, properly labeled, etc.). (See Section O.1.3.4)

13) Facility inspections to detect leaks, spills, or deterioration.

O.1.3.4 Management of Incompatible Wastes in Containers

The following management procedures are used to ensure that incompatible wastes and materials are not placed in the same container or in an unwashed container that previously held incompatible waste:

1) Not processing incompatible wastes in the same treatment unit in the Pilot Plant at the same time unless certain precautions are taken. See section O.1.3.2 and Section L of the WAP.

2) All hazardous and non-hazardous waste containers are properly labeled. Container labels used by The Facility include hazards associated with each waste. Information on the label will specify if the waste is incompatible with other materials (i.e. contains sulfide - do not combine with acids). Pilot Plant personnel are instructed to check container labels before adding or removing material.

3) All hazardous and non-hazardous waste containers are washed immediately following each use unless the container will be used to hold the same waste. Drum labels are not removed until the container has been washed. Pilot Plant personnel are instructed not to use empty containers, which are still labeled, unless specifically instructed to do so and then only if the waste or material to be added is compatible with what was previously in the container.

4) If incompatible material must be combined in a container special written procedures and precautions are provided. Laboratory scale tests are conducted according to the Waste Analysis Plan, Appendix F Section L, (see page 8) to assure that the materials can be combined safely. Supervision is provided when incompatible materials must be combined.

5) An aisle (11 feet) must separate incompatible wastes or materials. This ensures incompatible wastes will not combine in the event of a spill.

6) All levels of a rack must contain compatible wastes and materials when vertical stacking containers or pallets.

7) 55 gallon drums and smaller containers are stored on pallets to maintain separation from potential spills

O.1.4 Container Standards

The inventory of hazardous and non-hazardous waste stored in containers at any one point in time may be comprised of a variety of different container types and sizes. The Facility has little control over what type and size of container a client chooses to use for shipping test material. Since generators of hazardous wastes are required to comply with all applicable RCRA and DOT regulations regarding shipping, the containers used must conform to RCRA and DOT standards for the material being shipped. Prior to testing, the Facility customarily stores test material in the shipping containers as received unless the containers show signs of damage, leaking, or corrosion or containers are known to be inadequate.

It is customary to collect processed effluent in separate containers for each test condition that is performed. Left over raw feed or special feed mixes are also stored in separate containers. Generally, the Facility uses 30 or 55-gallon drums or 275-gallon polyethylene totes depending on the volume for this purpose.

Processed effluent and feed samples are generally collected in polyethylene or polypropylene sample containers that range in size from 100 ml sample bottles to 5-gallon pails. Glass sample bottles from 50 ml. to 1 liter in size are also commonly used. These sample containers are selected on a project specific basis and are of the type widely used by laboratories throughout the country.

Containers used for shipping test material back to the client must be handled on a case-by-case basis. In some cases, the original shipping containers may be used to return test material. In other cases, DOT approved shipping containers must be purchased. DOT approved polyethylene drums or totes are utilized for hazardous and non-hazardous waste. Occasionally steel drums are used.

Process effluents are always cooled to below 100ºF before being transferred into drums to avoid deformation of the polyethylene.

If a liquid has a specific gravity of over 1.900, a specialized container will be procured for this type of material.

If the Waste Analysis Plan in Appendix F (Section K) indicates there is any reason to believe a waste may be incompatible with polyethylene, either a more appropriate container material will be used or laboratory tests will be conducted to determine the compatibility of polyethylene. Sample containers are also carefully selected to ensure compatibility with the waste contained.

Drums are thoroughly cleaned, and triple rinsed in the Pilot Plant building if required following each use and are reused as long as they remain in good condition. The rinse water is held in a storage container and is processed at the end of the study. All used drums are carefully inspected prior to use. Drums that are damaged are shipped offsite for disposal.

All containers of hazardous and non-hazardous waste are always securely covered, except when waste is added or removed.

All containers of hazardous and non-hazardous waste at The Facility are stored indoors and are not subject to direct sunlight, temperature extremes or precipitation. Hazardous and non-hazardous waste containers of 3 gallons or more are placed on pallets and stored in appropriate pallet racks according to hazard class in the Warehouse. The Warehouse pallet racks are designed to accommodate not more than one (1) 55-gallon drum height (47½ inches between racks), drums are not stacked. Containerized hazardous and non-hazardous wastes on pallets are never stacked directly on top of other containers. Not more than four (4) 55-gallon drums are placed on a single pallet. Containers of waste are never placed on a pallet in such a way as to cause one or more of the containers to tip off during transport or storage. Pallets are inspected prior to use for broken or rotten boards and for protrusions (nails, etc.) that could cause damage to a container. Containerized wastes are never stored in direct contact with standing liquids.

Separate storage racks are provided for storing reactive, caustic, acidic and ignitable wastes. If insufficient space is available in the designated rack, the storage will be rearranged to ensure that incompatibles are not stored next to or above and the racks clearly labeled to reflect the new arrangement. Wastes that do not fall within one of these hazard classes are stored in any of the general storage racks if all the wastes in that particular rack are compatible. Incompatible wastes/materials are never stored next to each other on the same storage rack.

Totes are typically stored on the floor, as totes do not fit on most of the upper levels of the racking. If sufficient space is not available in the designated area, the storage will be rearranged to ensure that incompatibles are not stored next to or above the totes and the racks clearly labeled to reflect the new arrangement. Aisle space down the main aisle and aisles between pallet racks in the storage warehouse are maintained at a nominal 11 feet to allow enough room to safely maneuver the forklift truck. This aisle space also provides room for routine inspections and allows for the unobstructed movement of personnel, fire protection equipment, spill control equipment and decontamination equipment to any area of the Hazardous Waste Storage Warehouse in an emergency. This also provides sufficient space between containers to visually see and inspect all pertinent labels.

O.1.5 Container Movement

Hazardous and non-hazardous waste containers of more than 5 gallons are usually placed on pallets prior to movement about the Facility. Containers of waste on pallets are transported about the Facility by fork truck and on occasion by hand operated pallet lift truck. Drums of hazardous and non-hazardous waste (over 10 gallons) delivered or shipped by semi-trailer are placed on pallets and unloaded or loaded by fork truck at the loading dock located on the south end of the Pilot Plant building or the loading dock on the north side of Shipping and Receiving. Locations of these loading docks can be found in Appendix A, figure B-10. Drums being unloaded are transported directly from the loading dock to the Pilot Plant or Hazardous Waste Storage Warehouse by fork truck. Drums of waste are then labeled, sampled, and placed in appropriate storage racks until they are needed for feasibility study work in the Pilot Plant building. Upon completion of a feasibility study, the Pilot Plant containers are placed on pallets and moved by fork truck back to the Hazardous Waste Storage Warehouse. In the Pilot Plant individual drums of waste are handled by two-wheel drum truck or by overhead crane and adjustable drum carrier. Totes are handled in a similar manner, only not palletized.

Hazardous and non-hazardous waste samples of 5 gallons or less are generally transported about the Facility by hand trucks or on sample carts.

Containers are always inspected prior to movement to ensure that the closures are secure and are not damaged or leaking.

O.1.6 Container Labeling

Every waste container of over three (3) gallons has a label containing the following information:

- Sample number
- Date of sample (date received, or the date waste was first introduced to the container)
- Hazardous waste information if applicable
- Any special hazards (including RCRA and DOT hazard codes)

Also, upon receipt all containers containing feasibility study wastes (>3 gallons) will be labeled with the following information to properly define their regulatory status and type of treatment planned.

- Regulatory Status labeled as one of the following: Hazardous, non-Hazardous, or non-solid waste
- Treatment to occur labeled as either: WWTU treatment or Treatability Study Testing

A sample usage form (Appendix N) is attached to all containers over three (3) gallons immediately upon storage in the Hazardous Waste Storage Warehouse or Pilot Plant.

The sample number identifies the container for reference purposes. The sample number is comprised of three groups of numbers. The first four digits refer to the logbook, the next three digits refer to the page number of the logbook and the last two numbers refer to the sample on that page. For each sample, whether it is a tote or drum or bucket, this entry in the logbook will include the following information:

a) Sample number

b) Date sample was received

c) Sample/container size

d) Person preparing the sample

e) Type of sample (Feed, Effluent, etc.)

f) Company name and address

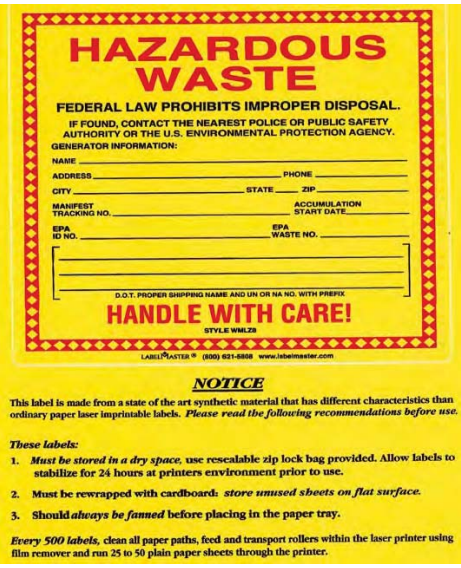
Logbooks contain the project name and project numbers and are retained. Samples and containers of treated waste are recorded in the project logbooks using the same numbering system. The project name and number can be used to locate specific data that was supplied by the generator on the Waste Characterization form. Waste characterization forms and other RCRA related paperwork specific to each project are retained in project folders.

Information and data on samples taken during and after testing can be obtained by contacting the project manager responsible for the project. Specific operating data and records are retained.

Monthly inventory of the hazardous and non-hazardous waste stored in the Hazardous Waste Storage Warehouse and Pilot Plant is performed. The inventory is comparted to and reconciled against the most current version of the “Active Waste Inventory Form” (Appendix D).

The container label or drum label remains on the container until the container is washed or shipped back to the client.

In addition to the sample label, each container of hazardous waste also has the following label:



The information indicated on the label is filled in when the label is affixed.

P. SUBCHAPTER BB AND CC – AIR EMISSION CONTROL STANDARDS FOR CONTAINERS AND TANKS

The Facility receives shipments of materials for feasibility studies in 55-gallon drums and 275-gallon totes. None of the material shipped to the Facility in totes is in “light material service” so only Level 1 container standards apply. Therefore, all the containers containing wastes with a volatile organic concentration of greater than 500 ppmw are managed for emissions purposes according to Level 1 standards. However, most wastes received have a volatile organic concentration of less than 500 ppmw and do not fall under Subpart CC regulations. The Facility does not accept or store wastes with greater than 10% organics, Subchapter BB does not apply.

Within 24 hours after any container is received, it is inspected for leaks, signs of corrosion or damage to the seals. All wastes that are received are kept in the original DOT shipping container until transferred to a feasibility study unit, transferred to a sample container for analysis, returned to the customer, or shipped to a disposal site. Treated wastes and wastes generated on site that contain more than 500 ppmw volatile organics are placed in containers that meet U.S. Department of Transportation (DOT) regulations for transport of hazardous materials (Level 1 standard).

To ensure that the release of volatile organics is minimized, all containers are kept sealed except when sampling, adding waste or transferring waste out of the containers. Containers will only be left open after they have been emptied and cleaned.

Drums containing solvents for disposal will always remain sealed except for when solvent is being added to the drum. A partially filled drum will be fitted with a spring-loaded vacuum/pressure relief device to prevent failure of the drum.

Q. CERTIFICATION

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

Name: Anthony Pink

Title: VP Water Solutions

Company: Siemens Energy, Inc.

Signature:

Date: 04/22/2021