

DEPARTMENT OF ENVIRONMENTAL QUALITY  
AIR QUALITY DIVISION  
**ACTIVITY REPORT: On-site Inspection**

B264461952

|   |                                      |                                  |
|---|--------------------------------------|----------------------------------|
| <b>FACILITY:</b> Hemlock Semiconductor Operations LLC             |                                      | <b>SRN / ID:</b> B2644           |
| <b>LOCATION:</b> 12334 Geddes Rd., HEMLOCK                        |                                      | <b>DISTRICT:</b> Bay City        |
| <b>CITY:</b> HEMLOCK  |                                      | <b>COUNTY:</b> SAGINAW           |
| <b>CONTACT:</b> Jeff Schrems , Associate Environmental Specialist |                                      | <b>ACTIVITY DATE:</b> 02/22/2022 |
| <b>STAFF:</b> Nathanael Gentle                                    | <b>COMPLIANCE STATUS:</b> Compliance | <b>SOURCE CLASS:</b> MAJOR       |
| <b>SUBJECT:</b> Scheduled On-site Inspection FY2022               |                                      |                                  |
| <b>RESOLVED COMPLAINTS:</b>                                       |                                      |                                  |

On February 22, 2022, AQD staff conducted a scheduled onsite inspection at Hemlock Semiconductor Operations (HSC), SRN B2644. AQD staff consisted of myself, accompanied by Ms. Gina McCann. The purpose of the inspection was to determine compliance with the Federal Clean Air Act; Article II, Part 55, Air Pollution Control of Natural Resources and Environmental Protection Act, 1994 Public Act 451; Michigan Department of Environment Great Lakes and Energy, Air Quality Division (AQD) Administrative Rules; and to evaluate compliance with the facilities Renewable Operating Permit (ROP), MI-ROP-B2644-2021. EGLE staff were assisted onsite by Mr. Jeff Schrems, and Mr. Gerard Manley. Records were provided by Mr. Jeff Schrems. At the time of inspection, the facility was found to be in compliance.

## Facility Description and History

HSC is located at 12334 Geddes Road, Hemlock, MI 48626. The facility is largely surrounded by agricultural cropland and residences. DDP Specialty Electronic Materials US 9, LLC, is located directly to the east of the HSC facility.

HSC produces high purity polycrystalline silicon for semiconductor and photovoltaic manufacturers. Chlorosilanes are converted to polycrystalline silicon and deposited onto starter rods in chemical vapor deposition vessels, called jars. The process operates under high temperatures. The manufacturing process includes raw material storage, polycrystalline silicon production, and silane and chloride recovery. The majority of components in the process exhaust associated with production are recovered for reuse via vapor recovery systems in place. Exhaust components that cannot be recovered are vented to caustic scrubbers associated with each vapor recovery system.

Silicon starting rods are designed and fabricated onsite. The starting rods are etched using nitric acid and hydrofluoric acid prior to placement in the reactor vessels. High purity polycrystalline silicon produced in the reactor vessels is removed. The silicon chunks are washed using hydrofluoric acid and DI water to remove surface impurities. Emissions from etching and washing are controlled by caustic scrubbers. The final product is 99.99% pure polycrystalline silicon which is packaged and shipped to HSC customers.

HSC operates three permitted natural gas fired boilers for process steam production and heat. Two of the boilers have a heat capacity of 98 MMBtu/hr. The third boiler has a rated heat capacity of 152 MMBtu/hr. All three boilers are equipped with and utilize low NOx burners and flue gas recirculation. In addition to the three permitted boilers, the facility operates several

smaller steam and hot water boilers and natural gas fired process heaters to provide process heat at the site.

Hydrochloric acid (HCl) is stored onsite. Chlorosilanes used in production become hydrochloric acid upon contact with air. Hydrochloric acid is recovered as part of the onsite vapor recovery systems. Under normal processing conditions, only small amounts of HCl are released. There is potential for larger HCl releases resulting from process leaks and upset conditions. Emissions from the vapor deposition process are tracked and operate as exempt pursuant to R. 336.1290.

A variety of additional auxiliary emission units exist at the facility. These emission units include emergency engines for energy production, fire pumps, cold cleaners, a coating booth, and a gasoline dispensing facility for onsite equipment and vehicles.

MI-ROP-B2644-2021 is a sectioned ROP. Section 1 of the ROP covers the HSC operations at the facility. Section 2 of the ROP was established for Linde Inc. Linde Inc. produces hydrogen by steam methane reforming. The hydrogen is used to fuel onsite processes at HSC.

HSC is a major source for NO<sub>x</sub> and CO, and a minor source of HAPs and VOCs. The facilities potential to emit (PTE) exceeds 100 tons per year for both NO<sub>x</sub> and CO. As a major source with a ROP, the facility is required to submit annual and semi-annual compliance reports. The facility has historically submitted these reports on time and complete to the AQD. Emission reporting to MAERS by the facility has also historically been submitted on time and complete. No recent complaints are on file for the facility. HSC was last inspected in February 2020. At the time of the 2020 inspection, the facility was found to be in compliance.

## Compliance Evaluation

### Section One

#### EUS11ETCH

EUS11ETCH is the onsite etching process for silicon starting rods. The process consists of a series of dip tanks in which the rods are submerged by an automated system. The rods are etched using nitric acid and hydrofluoric acid. Emissions from the etching process are captured and sent to a caustic scrubber. Emissions from the on-site nitric acid tanks are also captured and sent to the scrubber.

The scrubber associated with the process is equipped with a system to monitor the pH, and flow rate, S.C. IV. 2. The scrubbing liquid shall be maintained at a minimum pH of 7, S.C. III. 1. The flow rate of the liquid shall be at a minimum rate of 150 gallons per minute, S.C. III. 2. The system will audibly alarm if the scrubber parameters are outside the system set points. If the alarm were to sound, corrective action is taken to ensure the pH and flow rates are corrected. Facility personnel report the company in which the scrubber is manufactured by, performs maintenance checks on the scrubber unit every quarter, S.C. IV. 1.

The acid bath temperature in the etch sink shall not exceed 52 degrees Celsius, S.C. III. 3. The process is equipped with a system to monitor the temperature of the acid bath. Facility staff

report an alarm will sound if the temperature exceeds the system setpoint. In addition to sounding an alarm, the bench will automatically drain if a temperature exceedance occurs.

Hydrogen fluoride emission limits are in place for EUS11ETCH, S.C. I. 2. and S.C. I. 3. Compliance with these emission limits is demonstrated through proper operation of the caustic scrubber. At the time of inspection, the scrubber appeared to be maintained and operated properly.

A NOx emission limit of 39 tpy on a 12-month rolling time period is in place for the unit, S.C. I. 1. The facility tracks and calculates NOx emissions in a spreadsheet based on run time hours for EUS11ETCH. Records of monthly and 12 month rolling NOx emissions were provided and reviewed, S.C. VI. 2. During calendar year 2020 the highest monthly NOx emissions occurred in August with 38.66 lbs/month NOx emitted. The lowest monthly emissions in calendar year 2020 occurred in June with 5.47 lbs/month NOx emitted. During calendar year 2021, the highest monthly emissions occurred in May with 13.43 lbs/month emitted. The lowest monthly emissions in calendar year 2021 occurred in June with 6.55 lbs/month emitted. Monthly NOx emissions are used to track and calculate NOx emissions on a 12-month rolling time period. During the period of records reviewed, the highest 12-month rolling time period emissions was 0.11 tpy, well below the limit of 39 tpy.

Special condition VI. 4. requires records be maintained of observations of the daily presence or absence of visible emissions. Daily observations may be performed by either a Method 9 certified or a non-certified observer. If visible emissions are observed, opacity shall be measured using Method 9, if conditions are such that Method 9 readings can be taken. Operators at HSC perform visible observations as part of daily rounds. Should visible observations be observed, HSC has staff available that are Method 9 certified. Records of daily observations were reviewed for the months of January, April, July and November 2021. The facility maintains spreadsheets in which the date the observation was taken, who the observer was, if visible emissions were observed, and any additional comments are recorded. During the period of records reviewed, no visible emissions were observed.

## **EUBOILER10**

EUBOILER10 is a natural gas fired boiler with a rated heat capacity of 152 MMBtu/hr and equipped with low NOx burners and flue gas recirculation. The unit was installed in February 2020 and is used to generate steam and process heat for the facility. During the onsite inspection, EUBOILER10 was observed. The unit was operating at 26%.

A malfunction abatement plan (MAP) is established and implemented for the unit. A copy of the MAP was submitted to the AQD within 180 days of permit issuance, S.C. III. 1. Routine maintenance is conducted on the unit, including annual testing by the manufacturer, to ensure the low NOx burner and flue gas recirculation system are maintained and operating properly, S.C. IV. 2.

EUBOILER10 is equipped with a device to monitor and record natural gas usage, S.C. IV. 3. Records of natural gas usage were provided and reviewed for calendar year 2021. Natural gas usage is recorded daily in KSCF/hour daily sum. During the reviewed period, the max daily usage was 1,979.276 KSCF, the minimum daily usage was 0.000 KSCF. The average daily fuel

consumption during the reviewed period was 1,220.374 KSCF. Total fuel usage during calendar year 2021 was 445,436.376 KSCF.

HSC calculates and maintains records of the annual capacity factor for natural gas for EUBOILER10, S.C. VI. 6. A graph displaying the monthly calculated 12-month rolling annual capacity factor was provided for calendar year 2021. During calendar year 2021, the highest 12-month rolling capacity factor occurred at the end of January 2021 with a capacity factor of approximately 43.3. The lowest occurred at the end of December 2021 with a value just below 37.0.

EUBOILER10 uses a predictive emissions monitoring system (PEMS) to monitor NOx emissions, S.C. IV. 4. Records of NOx emissions were provided and reviewed for calendar year 2021. Records of NOx daily emissions in tons per day are maintained. During calendar year 2021, the max daily NOx emissions was 0.036 tons per day. The total NOx emissions for calendar 2021 was 7.380 tons, well below the facilities limit of 24.6 tpy, S.C. I. 2. HSC staff provided a query report of NOx tons 12-month rolling sum for the period of January 1, 2021 to December 31, 2021 which demonstrated the facility did not exceed the limit of 24.6 tpy during the period.

Records of 30-day rolling average NOx emissions in lb/MMBtu are maintained and were provided for calendar year 2021. Special condition I. 1. limits NOx emissions to 0.037 lb/MMBtu on a 30-day rolling average. During the period of records reviewed, exceedances of the emission limit occurred between the period of 8/17/2021 to 9/3/2021. The max NOx emissions during the period reviewed was 0.040 lb/MMBtu 30 day rolling average. HSC had previously self-reported these emission exceedances and a Violation Notice (VN) was issued for the violation on November 10, 2021. HSC reports the emission exceedances occurred as a result of operating the boiler intermittently when in standby mode. During those periods, the boiler was operated for up to 0.5 hours twice daily. HSC reports the 30-day average limit exceedance was the result of the low BTUs the unit was generating. In response to the VN, HSC submitted a PTI modification application. PTI 185-18A was issued on 2/10/2022. PTI 185-18A establishes the NSPS limit of 0.20 lb NOx/MMBtu on a 30-day rolling average for EUBOILER10. During the onsite inspection, HSC staff were reminded to submit an application to modify the facilities ROP before the new PTI goes into effect for the unit.

## **FG130WASH**

Polycrystalline silicon produced at HSC is broken into chunks and washed using hydrofluoric acid and DI water to remove any surface impurities from the final product. FG130WASH encompasses emission units in the washing process. Emissions from FG130WASH are controlled by a Tri-Mer packed bed scrubber, model V/F-072-120, using a caustic solution, S.C. IV. 1. The scrubber is equipped with pH probes and a flow meter, S.C. IV. 4. The pH and flow of the scrubber are continually monitored by an operator in the control room at the facility to ensure the proper parameters are maintained for the unit, S.C. VI. 1. Routine maintenance, including quarterly equipment checks, are performed on the scrubber to ensure the control equipment is maintained and operated properly, S.C. IV. 1. Packing material within the scrubber is replaced annually.

Hydrofluoric acid used in FG130WASH is obtained from totes. EUHFTank1 and EUHFTank2 are listed within the facilities ROP as being hydrofluoric acid storage tanks, each with a capacity of 10,000 gallons. HSC staff report these tanks no longer store hydrofluoric acid and are no longer

used as part of the FG130WASH process. These units and any associated conditions should be addressed within the facilities ROP.

## **FGBOILERS**

**FGBOILERS** consists of two natural gas boilers, **EUBOILER8** and **EUBOILER9**. Both boilers have a maximum rated heat input of 98 MMBtu/hr and are equipped with low-NOx burners and flue gas recirculation. Special condition I. 1. limits NOx emissions from **FGBOILERS** to 0.05 lb per MMBtu. Compliance with this emission limit may be demonstrated by testing at the owner's expense, S.C. V. 1. **EUBOILER9** was observed during the onsite inspection. The unit was in operation, operating at 20% demand.

**EUBOILER8** and **EUBOILER9** are both fueled with natural gas only, S.C. II. 2. Both units are equipped with a device to monitor and record fuel usage, S.C. VI. 1. Records of fuel usage are maintained, S.C. VI. 2. The facility tracks daily, monthly and 12 month rolling natural gas usage for the units. Special condition II. 2. states that fuel use for **FGBOILERS** shall not exceed 1400 million standard cubic feet per 12-month rolling time period, as determined at the end of each calendar month. Facility fuel usage records were reviewed for calendar years 2020 and 2021. During the reviewed period, the maximum 12-month rolling fuel usage for **FGBOILERS** occurred at the end of October 2020 with 713.64 MMCF of fuel used, well below the facility limit of 1400 MMCF.

Facility personnel report routine maintenance is conducted on **EUBOILER8** and **EUBOILER9**. Routine maintenance is tracked using the facilities SAP work order system, S.C. VI. 4. In the event unplanned maintenance is needed on either of the units, facility personnel report a work order is put in and the maintenance is completed.

## **FGRULE290**

The polycrystalline silicon manufacturing process includes raw material storage, polycrystalline silicon production, and silane and chloride recovery. Emissions of HCL and particulate matter (PM) are released from onsite processes and are tracked by the facility. **FGRULE290** encompasses emission units that operate as exempt from the requirements of Rule 201 pursuant to Rule 278, Rule 278a and Rule 290. The flexible group currently contains 23 emission units, all of which were installed prior to December 20, 2016.

During the onsite inspection, AQD staff were shown a subset of buildings and processes included in **FGRULE290**. Many buildings and their associated processes operate similar equipment and processes. For the sake of time, AQD staff observed a subset to better understand operations at the facility.

AQD staff visited **EUPLTVENT4**. Emissions from Plant Vent 4 include those from the Polycrystalline silicon manufacturing process, including raw material storage and polycrystalline silicon production. Associated with Plant Vent 4 is a chlorosilane and chloride recovery process. GC sensors are used to determine how much material is recovered and reused. Recovered material is not counted towards the facilities emissions. The recovery process is a closed system with emissions feeding to a common vent header system controlled by two scrubbers. One scrubber operates at a time with the other in place as a backup. The scrubbers are equipped with probes to monitor pH and scrubber flow rate. These parameters are monitored 24/7 by operators within

the facilities control room. For the scrubbers associated with EUPLTVENT4 staff report the pH is maintained in the range of 6-7, while the flow rate is maintained around 200 gpm. The system is equipped with an alarm system that will sound if the flow rate drops below 170 gpm. At the time of inspection, the flow rate was observed to be 214.7 gpm. The pH was observed to be at 1.6. Due to the low pH, the system was in the process of raising the pH. The scrubber solution used consists of a mixture of water and sodium hydroxide.

As part of the polysilicon production, chlorosilanes are converted to polycrystalline silicon and deposited onto starter rods in chemical vapor deposition vessels, called jars. Jars must be cleaned between each batch. Devices are in place at the facility to clean the jars. Jars are moved and placed on one of the cleaning devices and cleaned. The cleaning devices are equipped with vacuum system scrubbers to control HCL and particulate emissions. A sodium hydroxide solution is used within the vacuum system scrubbers. A portion of the vapor deposition process and the associated vacuum system scrubbers were observed while onsite.

HSC tracks emissions for units operating within FGRULE290. HCL emissions are tracked and determined based on equipment efficiency using material throughputs, S.C. I. 1. Particulate emissions from material storage bins are determined based on measured weight differences, S.C. I. 3. Records of emissions are maintained. Emission records for calendar year 2021 were provided and reviewed. Emissions are recorded on a monthly basis for each unit operating as exempt under R290. With the exception of February 2021, emissions for the period reviewed are well below 500 lbs/month.

For the month of February 2021, emissions of HCL from EUS072VAC are recorded as being 4121.32 lbs/month. The excess emissions resulted from a onetime release that occurred during facility maintenance. Chlorosilane residue was discovered on a level transmitter. During the repair, personnel were removing insulation when a valve separated from process piping, resulting in the HCL release. HSC staff self-reported the release to the AQD. As corrective action, the leak was repaired. In addition, the facility updated their engineering specifications and completed assessments where threaded stainless is used onsite. A VN was not issued for the leak.

Special condition VI. 3. requires that for each emission unit that emits noncarcinogenic particulate air contaminants pursuant to Rule 290(2)(a)(iii), the permittee shall perform a monthly visible emission observation of each stack or vent during routine operating conditions. Records of monthly visible emission monitoring were provided and reviewed for calendar year 2021. HSC performs monthly visible emissions monitoring for all emission units in FGRULE290. A spreadsheet is used to track observations. Information documented on the spreadsheet includes, tracking each vent observed, the date the observation was made, who the observations were completed by, and whether visible emissions were observed. During the period of records reviewed, no VE's were observed.

## **FGCOLDCLEANERS**

HSC maintains and operates three cold cleaners. All three cold cleaners utilize the same cleaning solvent. A copy of the sds for the cleaning solvent was provided. The cleaning solution used is 100% petroleum distillates, hydrotreated light. The sds was reviewed and the solvent was verified not to contain any of the halogenated compounds listed in S.C. II. 1. Facility staff report cold cleaners onsite remain covered when not in use, S.C. IV. 3. The solvent within each of the

cold cleaners is not agitated or heated, S.C. IV. 4. Solvent is maintained and disposed of by a third party, Safety Kleen, S.C. VI. 4.

### **FGRULE287(2)(c)**

The HSC facility has a paint booth onsite, EUPAINTBOOTH, used to coat and maintain onsite equipment. EUPAINTBOOTH operates as exempt from the requirements of Rule 201 pursuant to Rule 278, Rule 278a, and Rule 287(2)(c). The paint booth is enclosed and equipped with filter controls, S.C. IV. 1.

Paint usage within the unit is tracked by the facility and records are maintained. Records of paint usage for calendar year 2021 were provided and reviewed. HSC maintains a spreadsheet in which the amount of each paint and thinner used within EUPAINTBOOTH is recorded. Daily paint usage records are maintained. Daily records are used to track monthly and yearly paint usage. During calendar year 2021, a total of 810.00 gallons of coating was used. The lowest monthly usage occurred in February 2021, with 13.50 gallons used. The largest monthly usage occurred in November 2021 with 133.50 gallons used, below the limit of 200 gallons/ month (minus water as applied), S.C. II. 1.

HSC tracks VOC emissions from EUPAINTBOOTH for MAERS reporting. VOC emissions are calculated using VOC data from material SDS's. The facility uses paint usage data and assumes all VOCs from both paint and solvents are emitted. HSC collects most of the used solvent and ships it out as hazardous waste. As a result, VOC emission calculations for EUPAINTBOOTH are conservative. For calendar year 2021 a total of 3,249.42 lb of VOCs was calculated to be emitted from EUPAINTBOOTH.

### **FGGASDISPACT**

HSC has an onsite stationary gasoline dispensing facility (GDF) used for the purpose of fueling onsite equipment. The GDF consists of EUGASAST1, a 2,500 gallon gasoline above ground storage tank, and EUGASAST2, a 1,000 gallon gasoline above ground storage tank. The requirements of the GACT for area sources of HAPs depends on the maximum monthly gasoline throughput and whether the throughput is less than 10,000 gallons per month, or at least 10,000 gallons per month and no more than 100,000 gallons per month.

Records of gasoline throughput for calendar year 2021 were provided and reviewed. Monthly gasoline throughputs are less than 10,000 gallons per month. The total gasoline throughput in calendar year 2021, including both emission units in FGDISPACT, was 83,453.6 gallons. With a gasoline throughput of less than 10,000 gallons per month, the facility must comply with the requirements of S.C. III. 1. Some of the requirements of S.C. III. 1. include, not handling gasoline in a manner that would result in vapor releases to the atmosphere for extended periods of time, minimizing gasoline spills, cleaning up spills as expeditiously as possible, and covering gasoline containers and all gasoline storage tank fill-pipes with a gasketed seal when not in use. Should the facility exceed a monthly throughput of 10,000 gallons, the requirements of S.C. III. 2. would become applicable.

### **FGMACTEMER**

**FGMACTEMER consists of four reciprocating internal combustion engines (RICE) subject to 40 CFR Part 63, Subpart ZZZZ. Two of the emission units in FGMACTEMER are RICE diesel emergency generators. EUGENS042 is an emergency generator with a rated capacity of 1,200 HP. EUGENS082 is an emergency generator rated at 535 hp. EUFPS069P1 and EUFPS069P2 are both RICE diesel fire pumps with a rated capacity of 267 hp.**

**S.C. II. 1. limits the sulfur content of diesel fuel used in each engine to a maximum content of 15 ppm (0.0015 percent) by weight and a minimum Cetane index of 40 or a maximum aromatic content of 35 volume percent. HSC demonstrated compliance with this requirement by providing a copy of the material SDS from the supplier. The facility utilizes ultra low sulfur diesel.**

**Units in FGMACTEMER are limited in the number of hours they may be operated outside of emergency operation. Each engine may be operated 100 hours per calendar year for maintenance and readiness testing, S.C. III. 5. In addition, each engine may be operated for up to 50 hours per calendar year in non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance and readiness testing, S.C. III. 6. Records of hours of operation during emergency and non-emergency operation for each engine in FGMACTEMER are maintained. Records were provided and reviewed for calendar year 2021.**

**EUGENS042 was operated a total of 3.7 hours during calendar year 2021. All hours of operation are labeled as being for maintenance/testing purposes. Monthly records show the unit was last operated in March 2021. HSC staff report the unit has been removed from the facility and will need to be addressed within the ROP.**

**EUGENS082 was operated for total of 14.9 hours during calendar year 2021. All hours of operation were for maintenance/testing purposes.**

**EUFPS069P1 was operated for a total of 14 hours during calendar year 2021. All 14 hours of operation were for maintenance/testing purposes. The unit is routinely operated for 0.5 hours every other week for maintenance/ readiness testing.**

**EUFP069P2 was operated for a total of 14.9 hours in calendar year 2021. All 14.9 hours of operation were for maintenance/ testing purposes. The unit is routinely operated for 0.5 hours every other week for maintenance/readiness testing.**

## **FGNSPSEMER**

**FGNSPSEMER consists of four compression ignition, internal combustion engines subject to 40 CFR Part 60, Subpart IIII. All four units are fire pumps. As compression ignition engines, the units are diesel fueled and fired. EUFPS369P1 and EUFPS369P2 are both fire pumps with an engine displacement of 8.1 liters/6 cylinders. Both units were manufactured in 11/2006 and rated at 205.07 KW. EUFPS569P1 and EUFPS569P2 are both fire pumps with an engine displacement of 6.8 liters/6 cylinders. Both EUFPS569P1 and EUFPS569P2 were manufactured in 12/2009 and are rated at 236 KW.**

**S.C. II. 1. limits the sulfur content of diesel fuel used in each engine to a maximum content of 15 ppm (0.0015 percent) by weight and a minimum Cetane index of 40 or a maximum aromatic**



content of 35 volume percent. HSC demonstrated compliance with this requirement by providing a copy of the material SDS from the supplier. The facility utilizes ultra low sulfur diesel.

Emission limits are stipulated for units within FGNSPSEMER. EUFPS369P1 and EUFPS369P2 have a PM limit of 0.54 g/KW-hr, S.C. I. 1. Additionally, the two units have a NMHC + NO<sub>x</sub> limit of 10.5 g/KW-hr, S.C. I. 2., and a CO limit of 3.5 g/KW-hr. EUFPS569P1 and EUFPS569P2 have a PM limit of 0.2 g/KW-hr, S.C. I. 4., and a NMHC + NO<sub>x</sub> limit of 4.0 g/KW-hr, S.C. I. 5. Compliance with these emission limits is maintained by purchasing engines that are certified to the applicable emission standards. Engines must be installed and configured according to the manufacturer's specifications, S.C. VI. 1.

Units in FGNSPSEMER are limited in the number of hours they may be operated outside of emergency operation. Each engine may be operated 100 hours per calendar year for maintenance and readiness testing, S.C. III. 1. In addition, each engine may be operated for up to 50 hours per calendar year in non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance and readiness testing, S.C. III. 2. Records of hours of operation during emergency and non-emergency operation for each engine in FGNSPSEMER are maintained, S.C. VI. 3. Records were provided and reviewed for calendar year 2021.

EUFPS369P1 was operated for a total of 14.6 hours in calendar year 2021. Of those 14.6 hours, 1.5 hours were for emergency operation and 13.1 hours were for maintenance and readiness testing. The unit is routinely operated for 0.5 hours every other week for maintenance/readiness testing.

EUFPS369P2 was operated for a total of 28.1 hours in calendar year 2021. Of those 28.1 hours, 2.4 hours were documented as being for emergency operation and 25.7 hours were for maintenance and readiness testing. The unit is routinely operated for 0.5 hours every other week for maintenance/readiness testing.

EUFPS569P1 was operated for a total of 16.2 hours in calendar year 2021. All 16.2 hours of operation were for maintenance and readiness testing. Records indicate the unit was not operated for emergency purposes during calendar year 2021. The unit is routinely operated for 0.5 hours every other week for maintenance/readiness testing.

EUFPS569P2 was operated for a total of 19.7 hours in calendar year 2021. All 19.7 hours of operation were for maintenance and readiness testing. Records indicate the unit was not operated for emergency purposes during calendar year 2021. The unit is routinely operated for 0.5 hours every other week for maintenance/readiness testing.

## Section Two

### EUH2PLANT

EUH2PLANT encompasses equipment used to produce hydrogen by the process of steam methane reforming, including a steam methane reformer, a shift reactor, a deaerator, and a pressure-swing adsorption purification unit. Pursuant to S.C. VI. 1., the permittee shall monitor the steam methane reformer combustion chamber temperature and the feedstock natural gas

flow rate during each start up event. Records of start up events were provided and reviewed for calendar year 2021.

During calendar year 2021, five start-up events were recorded. For each start-up event, the following information is recorded, the start-up event beginning date and time, the reformers combustion chamber temperature immediately before feed stock introduction, the feed stock natural gas flow rate at the time the feedstock flow rate is established, the feedstock natural gas flow rate immediately before the operator initiates venting down stream of the PSA unit, the time and date the event ends, and the duration of start-up events. Records maintained satisfy the record keeping requirements of S.C. VI. 2. The average duration for start up events in calendar year 2021 was 29.4 hours.

## Summary

Hemlock Semiconductor (HSC) produces high purity polycrystalline silicon for semiconductor and photovoltaic manufacturers. The manufacturing process includes raw material storage, polycrystalline silicon production, and silane and chloride recovery. HSC is a major source for NOx and CO, and a minor source of HAPs and VOCs. Based on records reviewed and the observed activities onsite, the facility appears to be operating in accordance with the requirements of MI-ROP-B2644-2021. At this time, the facility appears to be in compliance.

*Nathanael Dentel*

DATE 3/7/2022

SUPERVISOR *Chris Hare*

NAME \_\_\_\_\_