



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10**

1200 Sixth Avenue, Suite 155
Seattle, WA 98101

ENFORCEMENT &
COMPLIANCE ASSURANCE
DIVISION

**Clean Air Act - Section 112(r)
Risk Management Program
and EPCRA 312 – Tier II
Facility Inspection Report**

FACILITY INFORMATION:

Name: SEH America, Inc.
Physical Address: 4111 NE 112th Avenue, Vancouver, WA 98682
Phone Number: 360-883-7000
Latitude/Longitude: 45.650278 / -122.556667
RMP Facility ID#: 1000 0003 4946
FRS ID#: 110000538785
EJ Concerns: Yes (80%)

CONTACT INFORMATION (RMP Implementation):

Name: Tatuso Ito, Executive Vice President
Phone Number: 360-883-7656
E-mail: Tatuso_Ito@sehamerica.com

EMERGENCY CONTACT INFORMATION:

Name: Pat McDonnell, VP of Site Services
Phone (24-hr): 509-449-6659
E-mail: Pat_McDonnell@sehamerica.com
Website: www.sehamerica.com/

TRIP DETAILS:

Inspection Date: February 28, 2023
Inspection Time: 0900 hours through 1555 hours
Inspectors: Terry Garcia, US EPA Region 10 SEE Grantee, Lead RMP Inspector
Edward Johannes, US EPA Region 10 SEE Grantee, RMP Inspector
Erin Williams, US EPA Region 10, EPCRA Inspector
Mhara Coffman, US EPA Region 10, RMP Inspector
Lisa Graves, Weston Solutions, Inc., EPA START Contractor

DATE AND PROGRAM LEVELS OF SUBMITTED RMP:

Initial Submission Date: June 14, 1999
Date of Latest Update: November 25, 2020

Process (Program 1, 2, 3) as reported in RMP:

Process ID	Description	Process Chemical ID	NAICS Code	Program Level	Chemical Name CAS Number	Quantity (lbs)
1000113051	Hydrogen	1000141253	334413	3	Hydrogen (1333-74-0)	11,812
1000113052	Hydrogen Chloride	1000141254	334413	3	Hydrogen chloride (anhydrous) [Hydrochloric acid] (7647-01-0)	42,000
1000113053	Trichlorosilane Bulk Sys.	1000141255	334413	3	Trichlorosilane [Silane, trichloro-] (10025-78-2)	78,637

PURPOSE:

The purpose of this inspection was to determine whether this facility is in compliance with Section 112(r) of the Clean Air Act (CAA) and Title 40 Code of Federal Regulations (CFR) Part 68, Chemical Accident Prevention Provisions.

- The facility has been previously inspected in the past 5 years: No ☒ Yes ☐
If Yes, Date of Last Inspection: Last inspection was in 2015.
- The facility is High Risk: No ☐ Yes ☒
- Joint EPCRA inspection: No ☐ Yes ☒

CAA Title V Air Permit:

Does the facility have a CAA Title V Permit? No ☒ Yes ☐

If Yes, Permit Number:

RELEASE/ACCIDENT HISTORY:

Did the facility have a reportable release in the past 5 years? No ☒ Yes ☐

If Yes, Date and Description of the Release:

EPCRA TIER II REPORTING:

Did the facility submit the 2022 Tier II report to the SERC? No ☐ Yes ☒

If Yes, Date the Tier II was submitted: December 23, 2022

If No, calendar year of the most recent Tier II:

Did the facility submit a Tier II to the LEPC and local fire department? No ☐ Yes ☒

If Yes, Date the Tier II was submitted:

The 2022 SARA Tier II report for SEH America was emailed to Cindy Stanley at the Clark County LEPC and to the Vancouver Fire Department on February 23, 2023. Facility provided PDF copy of the transaction to EPA in email dated April 21, 2023.

INSPECTION ENTRY:

Terry Garcia led the inspection entry. The EPA Inspection Team (EPA) met with Nirav Sheth and facility personnel at the SEH America, Inc. (SEH) facility in Vancouver, Washington. The team arrived at the facility at 09:00 and was joined by the following facility personnel and Vancouver Fire Department representatives:

Name	Title
Nirav Sheth	Director of Facilities
Danielle Lenzini	Environmental Specialist
Sally Gifford	Safety Specialist
Brian Baird	Operations Supervisor
Carla Claffey	Security Supervisor
Teighlar Hidalgo	Training Tech – Facility Operations
Dave Weigel	Facility Maintenance Supervisor
Scott Grimm	Facility Engineer
Tedd Clovette	Safety Environmental Manager
Pat McDonnell	Vice President of Operations
Tom O'Connor	Special Operations Chief, Vancouver Fire Department
Lemont Lucas	Lead Deputy Fire Marshal, Vancouver Fire Department

Was a state/county/or local emergency representative present? No ☐ Yes ☒

If Yes, Name and Title of Representative: Tom O'Connor, Vancouver Fire Dept., Special Operations Chief and Lemont Lucas, Lead Deputy Fire Marshal.

The facility is a first responder: No ☐ Yes ☒

If No, Responding Agency:

EPA was escorted to a conference room located in the facility's office building, where Lead Inspector Terry Garcia made introductions, provided a summary of the risk management program (RMP), and explained the purpose of the visit. Each EPA team member presented his/her credentials.

EPA then requested an explanation of the facility's operations and any additional safety measures that should be taken during the site tour. Nirav Sheth gave a slide presentation to describe the business operation for facility. In addition, Nirav Sheth emphasized that select areas of the facility were off limits due to proprietary information associated with their product manufacturing process and requested photos and electronics to be restricted during the facility tour. Sally Gifford gave a slide presentation to review the facility safety features, emergency routes, and personal protective equipment (PPE) required for the tour.

Prior to the inspection, EPA sent a certified notice of inspection letter to the facility informing them of the CAA Section 112(r)(6)(L) requirement that facility employees and employee representatives (such as a union representative) have the right to participate in the RMP inspection, and that a copy of the letter must be provided to the employee representative(s) and the letter posted in a manner accessible to employees in the facility.

The facility is unionized: No ☒ Yes ☐

If Yes, Name of Union:

An employee representative present during the facility visit: No ☒ Yes ☐

If Yes, Name/Title:

GENERAL INFORMATION:

The facility is regulated under the RMP as a Program Level 3 facility and is owned and operated by SEH America, Inc.

SEH America, Inc. (SEH) manufactures high quality silicon wafers used in the manufacture of integrated circuits. The facility manufacturing operations are located in Vancouver, Washington. It is the only U.S. manufacturer for silicon and the largest producer of silicon wafers worldwide. The regulated substances handled by this facility are Hydrogen Chloride (HCl), Trichlorosilane (TCS), and Hydrogen and are located in secured access areas throughout the campus. The facility has approximately 900 full-time employees, and four operators have access to regulated substances.

HCl and TCS are used in the manufacturing of epitaxial wafers. The epitaxial process produces a thin layer of silicon on top of already polished wafers. HCl gas is used to etch the silicon wafers, and the liquid TCS aids in depositing the silicon in a layer atop the polished wafers. The facility handles a maximum 42,000 pounds of HCl gas, which it stores in two tube trailers, each with a capacity of 21,000 pounds. The facility stores a maximum of 78,637 pounds of liquid TCS on site.

Hydrogen is used in several processes in the facility. It is frequently used as a carrier gas for other chemicals. Hydrogen is stored as a liquefied gas at cryogenic temperature (-423 degrees Fahrenheit [°F]). The maximum quantity of hydrogen that can presently be stored or handled at this facility is 11,812 pounds. Messer Gas Company operates and maintains the bulk hydrogen storage system for SEH. The Messer technicians receive hydrogen safety training through an outside training company. SEH recently removed one liquid H₂ storage tank from the site, reducing the maximum quantity stored by 50%.

SEH is in the process of replacing the existing leased hydrogen tank with one that will be owned and operated by the facility. SEH has commissioned [will provide funding] Messer Gas Company to coordinate the removal of the tank, hire the riggers, and demo the pipe and pressure control equipment down to the pad. SEH is targeting to first fill of the new tank in July 2023 and beginning qualifications in late July. The new tank will be fully qualified in early September 2023 and then preparation for removal of the old tank can begin. The old tank removal will most likely occur in early January 2024.

ON-SITE OBSERVATIONS:

The facility tour was conducted from approximately 0945 hours to 1100 hours. Facility representative Nirav Sheth escorted EPA and other facility personnel during the inspection, and EPA observed and inspected equipment and areas of the regulated substances.

One active hydrogen above ground storage tank (AST) owned and maintained by the Messer Gas Company is located outside of Building 15 and is secured behind chain link fence (photo 1). The area is posted with emergency contact information for the active AST (photo 2). A newly installed facility-owned AST is in place for future hydrogen gas storage is adjacent to the active hydrogen AST (photo 3). SEH stated that the new AST is a 'replacement in kind' to the existing AST and will eventually replace the Messer-owned tank. The existing tank will be decommissioned and removed from the site.

Two large adjacent condensers support the active hydrogen AST (photo 4), and a touch screen control panel for hydrogen AST is located outside the fenced area (photo 5). There are manual emergency shutoffs around the fenced perimeter (photo 6). In addition, the system has built-in automatic shutoff (photo 7) and seismic shutoff (photo 8) features.

Building 17 contains the machine room and TCS storage area (photo 9). The offload area for TCS is outside of the building entry/exit. Signage directs PPE requirements for personnel tasked with offloading the TCS (photo 10). The TCS fill station panel, meter gauge, and emergency shutoff are easily accessible and clearly labeled (photos 11-13).

The machine room for TCS is in Mechanical Room 100. Inspectors toured the machine room, but no photos were taken. TCS is stored in Room 101, Bulk TCS RM (photo 14), adjacent to Room 100. Room 101 is designed with several safety features in the event of a release. TCS is stored in vessels above a secondary containment floor (photo 15). The room's ceiling is designed with break-away rooftop panels (photo 16). A gas detector panel is installed to monitor TCS (photo 17), and equipment and product lines are clearly labeled (photo 18). A windsock is located on the building (photo 19).

EPA observed a posted boiler inspection certificate date as out of date, and facility representatives provided a current copy during the document review (photo 20). Facility representatives informed EPA that one TCS vessel was out of service due to a ruptured disc disabling the pressure valve. The facility was working to identify ways to transfer the TCS in to alternate vessel before replacing the valve (photo 21). The rupture disc issue is not a documented finding, but the facility is in the process of addressing the issue and get a new pressure relief valve (PRV) online. The PRVs are due to be replaced in 2023.

Building 33 houses the facility emergency response vehicle (photo 22) and the Emergency Response Team (ERT) PPE and response equipment (photo 23).

Building 33 also includes "HCL Room 603," that stores bulk HCl (photo 24). The room is accessible through the ERT equipment room or from outside access door (photo 25). The HCl gas tubes are stored on two trailers above a secondary containment floor (photo 26). HCl quantities are visible from a control panel (photo 27). The room is designed with several safety features in the event of a release, including an emergency exit door, an emergency shower and eye wash, deluge system, HCl gas sensors, and alarms (photo 28).

Following the RMP inspection facility tour an Environmental Planning and Community Right-to-Know Act (EPCRA) inspection was conducted from approximately 1245 hours to 1310 hours. The EPCRA Coordinator, Erin Williams was escorted by Dave Weigel and Brian Baird to observe select bulk chemical storage areas and one facility charging station.

Several different bulk chemicals for the facility are stored in Buildings 62 and 63. The sulfuric acid tank was inspected in Building 62 (photo 29). Sulfuric acid, at an adjusted pH, is used in the waste treatment process and deliveries are received on a weekly basis. Nitric acid is stored in Building 63 (photo 30). Nitric acid is used in the etching process and bulk deliveries are received every two to three weeks. Hydrofluoric acid (49% concentration) is stored in Building 63 (photo 31 and 32). Hydrofluoric acid (49% concentration) is used in the etching process and deliveries are received every three to four months. Bulk chemicals were clearly labeled, and safety features were observed throughout these areas.

The SEH America property is 135 acres and has up to 100 golf carts for personnel to move quickly around the campus. One golf cart charging bay was inspected (photo 33).

Photographs were taken of the applicable RMP covered process and EPCRA process locations. The photographs that were taken at the facility are included in Attachment A to this report.

After touring the RMP-covered process areas at the SEH America facility, EPA returned to the conference room to review the RMP documentation. During the document review Mr. Tatuso Ito, Executive Vice President for the company entered the room briefly to welcome EPA to the site. Upon completion of the document review, EPA provided a debriefing to Nirav Sheth and facility personnel.

INFORMATION COLLECTED FROM FACILITY:

1. Site Area Figure PSM/RMP Locations
2. Site Area - Buildings and Green Space Acres
3. Evacuation Meeting Areas
4. Facility Maintenance Training Spreadsheet
5. HazMat and Maintenance PSM/RMP Training Spreadsheet
6. Business Cards for SEH America Representatives

AREAS OF CONCERNS ADDRESSED IN CLOSING CONFERENCE:

1. The facility did not include documentation of release scenarios for process vessel or pump releases due to cracks, seal failure, or drain, bleed, or plug failure. [68.28(b)(2)(iii)]; shipping container mishandling and breakage or puncturing leading to a spill. [68.28(b)(2)(v)]. SEH America was unable to provide documentation on the release scenarios for the hydrogen, HCl and TCS covered processes.
2. The facility initial Process Hazard Analysis (PHA) for the TCS storage process is not on file and missing. [68.67(g)]. The Initial 1997 PHA for TCS was provided after the inspection on March 10, 2023.
3. The facility's previous inspection for a second valve installation on the HCl system has expired and no follow up has been scheduled that was identified in the May 2020 PHA Revalidation. [68.67(e)]. SEH America stated that they will initiate an MOC for the change and are waiting for the parts to implement the change to complete the finding and recommendation.
4. The facility's Excellence Through Quality (ETQ) system (internal document control system for all PSM/RMP related requirements) indicates that the facility does not communicate a change in process to employees affected by the change. [68.75(c)]. The MOC's reviewed dated 2019 to 2021 and 2023 indicate that process changes are not always communicated to employees and documented.
5. The facility does not consult with employees on the conduct and development of process hazards analyses and on the development of the other elements of process safety management in chemical accident prevention provisions. [68.83(b)]. SEH America was unable to provide documentation showing that employees have been consulted with on the PHA and other RMP elements.
6. The facility has not obtained and evaluated information regarding the contract owner or operator's safety performance and programs when selecting a contractor. [68.87(b)(1)]. SEH America uses contractors such as JH Kelly; Cosco Fire; EC Electric and Messer Gas.

DOCUMENTS REQUESTED NOT INCLUDED IN REPORT:

The following documents were requested during the inspection but are not included in this report. These documents will still be reviewed to determine compliance with Section 112(r) of the CAA.

1. Refresher training dates for two operators (Ben Day and Joey York).
2. HCl initial PHA.
3. Shutdown list for HCl second isolation valve.
4. Training documentation for Messer Gas Company contractors involved in RMP processes.
5. Recommendations/action items for TCS ruptured disc relief valve.
6. 2023 pressure relief valve (PRV) replacement schedule.

On March 10, 2023, SEH America Inc. facility provided the requested follow up documentation via email to EPA. In addition, SEH America addressed further questions on the process of replacing the existing leased hydrogen tank with one that will be owned and operated by the facility.

INSPECTION REPORT CERTIFICATION:

This is to certify that I, Terry Garcia, was the lead inspector at this facility and that I have verified the accuracy of the observations in this inspection report:

Terry Garcia

Inspector Signature

Digitally signed by Terry Garcia

Date: 2023.05.21 11:56:15

-07'00'

JAVIER MORALES

Digitally signed by JAVIER

MORALES

Date: 2023.05.22 15:19:39 -07'00'

RMP Coordinator/Approval

ERIN WILLIAMS

Digitally signed by ERIN WILLIAMS

Date: 2023.05.24 11:27:53 -07'00'

EPCRA Coordinator/Approval

MATTHEW

QUARTERMAN

Digitally signed by MATTHEW

QUARTERMAN

Date: 2023.05.24 14:42:06 -07'00'

Land Enforcement Section Chief/Approval

Attachment A – Photo Log

Site Name: SEH America, Inc.
City, State: Vancouver, Washington
Photographer: Lisa Graves

File	Photo Layout ID	Date	Time	Description
Photo 1.jpg	1	2/28/2023	9:56 AM	Active Hydrogen Above Ground Storage Tank (AST) Near Building 15
Photo 2.jpg	2	2/28/2023	9:57 AM	Posted Emergency Contact Information for Active Hydrogen AST
Photo 3.jpg	3	2/28/2023	9:58 AM	New Inactive Hydrogen AST Replacement near Building 15
Photo 4.jpg	4	2/28/2023	10:02 AM	Evaporator System for Hydrogen AST
Photo 5.jpg	5	2/28/2023	10:09 AM	Touch Screen Control Panel for Hydrogen AST
Photo 6.jpg	6	2/28/2023	10:02 AM	Manual Emergency Shutoff Switch for Hydrogen AST
Photo 7.jpg	7	2/28/2023	10:04 AM	Electric Shutoff System for Hydrogen AST
Photo 8.jpg	8	2/28/2023	10:09 AM	Seismic Shutoff System for Hydrogen AST
Photo 9.jpg	9	2/28/2023	10:20 AM	Building 17 Trichlorosilane (TCS) Entry/Exit
Photo 10.jpg	10	2/28/2023	10:16 AM	TCS Offload Personal Protective Equipment (PPE) Sign
Photo 11.jpg	11	2/28/2023	10:17 AM	TCS Offload Panel
Photo 12.jpg	12	2/28/2023	10:17 AM	TCS Offload Electronic Gauge
Photo 13.jpg	13	2/28/2023	10:18 AM	TCS Emergency Shutoff for Offload Personnel
Photo 14.jpg	14	2/28/2023	10:40 AM	TCS Vessel
Photo 15.jpg	15	2/28/2023	10:38 AM	TCS Secondary Containment Floor
Photo 16.jpg	16	2/28/2023	10:38 AM	Building 17 TCS Break-Away Rooftop
Photo 17.jpg	17	2/28/2023	10:37 AM	Building 17 TCS Gas Detector Panel
Photo 18.jpg	18	2/28/2023	10:38 AM	TCS Evaporator Vessel
Photo 19.jpg	19	2/28/2023	10:12 AM	Building 17 Windsock
Photo 20.jpg	20	2/28/2023	2:17 PM	TSC Boiler Current Certificate of Inspection Document
Photo 21.jpg	21	2/28/2023	10:40 AM	TCS Vessel with Ruptured Pressure Valve Issue
Photo 22.jpg	22	2/28/2023	10:49 AM	Facility Emergency Response Vehicle in Building 33
Photo 23.jpg	23	2/28/2023	10:50 AM	Facility Emergency Response HazMat Gear in Building 33
Photo 24.jpg	24	2/28/2023	10:51 AM	Hydrogen Chloride Entry/Exit Room 603
Photo 25.jpg	25	2/28/2023	11:00 AM	Hydrogen Chloride Entry/Exit, Alarm System
Photo 26.jpg	26	2/28/2023	11:01 AM	Hydrogen Chloride Trailers (6-10 Gas Tubes) in Building 33
Photo 27.jpg	27	2/28/2023	10:56 AM	Hydrogen Chloride Control Panel
Photo 28.jpg	28	2/28/2023	10:58 AM	HCl Room 603 Emergency Exit, Showers, Sensors, and Alarms
Photo 29.jpg	29	2/28/2023	12:50 PM	Sulfuric Acid Vessel in Building 62 subject to Emergency Planning and Community Right to Know Act (EPCRA) Inspection
Photo 30.jpg	30	2/28/2023	12:54 PM	Nitric Acid Vessel in Building 63 Subject to EPCRA Inspection
Photo 31.jpg	31	2/28/2023	12:58 PM	Hydrofluoric Acid Label on Vessel Subject to EPCRA Inspection
Photo 32.jpg	32	2/28/2023	12:59 PM	Hydrofluoric Acid Vessel in Building 63 subject to EPCRA Inspection
Photo 33.jpg	33	2/28/2023	1:02 PM	Facility Vehicle Charging Area subject to EPCRA Inspection