



STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, Idaho 83706 • (208) 373-0502

C.L. "Butch" Otter, Governor
Toni Hardesty, Director

December 14, 2011

Todd Kirkendall
EHS Manager
One Hoku Way
Pocatello, ID 83204

RE: Facility ID No. 005-00058, Hoku Materials, Pocatello
Final Permit Letter

Dear Mr. Kirkendall:

The Department of Environmental Quality (DEQ) is issuing Permit to Construct (PTC) No. P-2008.0049 Project 60903 to Hoku Materials located at Pocatello. This PTC is issued in accordance with IDAPA 58.01.01.200 through 228 (Rules for the Control of Air Pollution in Idaho) and is based on the certified information provided in your PTC application received on July 25, 2011, and supplemental information provided on August 30, 2011.

This permit is effective immediately and replaces PTC No. 2008.0049, issued on August 14, 2007. This permit does not release Hoku Materials from compliance with all other applicable federal, state, or local laws, regulations, permits, or ordinances.

Pursuant to the Construction and Operation Notification General Provision of your permit, it is required that construction and operation notification be provided. If this information has not already been provided please provide this information as listed to DEQ's Pocatello Regional Office, Regional Office 444 Hospital Way #300, Fax (208) 236-6168.

In order to fully understand the compliance requirements of this permit, DEQ highly recommends that you schedule a meeting with Mr. Rick Elkins, Air Quality Analyst, at (208) 236-6160 to review and discuss the terms and conditions of this permit. Should you choose to schedule this meeting, DEQ recommends that the following representatives attend the meeting: your facility's plant manager, responsible official, environmental contact, and any other staff responsible for day-to-day compliance with permit conditions.

Pursuant to IDAPA 58.01.23, you, as well as any other entity, may have the right to appeal this final agency action within 35 days of the date of this decision. However, prior to filing a petition for a contested case, I encourage you to contact Dan Pitman at (208) 373-0502 or daniel.pitman@deq.idaho.gov to address any questions or concerns you may have with the enclosed permit.

Sincerely,


Mike Simon
Stationary Source Program Manager
Air Quality Division

MSDP

Permit No. P-2008.0049 PROJ 60903
Enclosures

Air Quality PERMIT TO CONSTRUCT State of Idaho Department of Environmental Quality	PERMIT NUMBER	CLASS	SIC
	P-2008.0049	SM	3339
	FACILITY ID	AQCR	NAICS
	005-00058	61	331419
	UTM ZONE	UTM COORDINATES (km)	
12	377.8 Easting	4,750.3 Northing	
PERMITTEE			
Hoku Materials, Inc.			
PROJECT			
PROJECT No. 60903 Permit to Construct Revision			
MAILING ADDRESS	CITY	STATE	ZIP
One Hoku Way	Pocatello	ID	83204
FACILITY CONTACT	TITLE	TELEPHONE	
Todd Kirkendall	EHS Manager	208-235-6016	
RESPONSIBLE OFFICIAL	TITLE	TELEPHONE	
Tao Zhang	President	808-682-7800	
EXACT PLANT LOCATION		COUNTY	
One Hoku Way – Site near South Philbin Road			
GENERAL NATURE OF BUSINESS & KINDS OF PRODUCTS			
Polysilicon Production Facility			
PERMIT AUTHORITY			
<p>This permit is issued according to the Rules for the Control of Air Pollution in Idaho, IDAPA 58.01.01.200 through 228, and pertains only to emissions of air contaminants regulated by the state of Idaho and to the sources specifically allowed to be constructed or modified by this permit.</p> <p>This permit (a) does not affect the title of the premises upon which the equipment is to be located; (b) does not release the permittee from any liability for any loss due to damage to person or property caused by, resulting from, or arising out of the design, installation, maintenance, or operation of the proposed equipment; (c) does not release the permittee from compliance with other applicable federal, state, tribal, or local laws, regulations, or ordinances; (d) in no manner implies or suggests that the Department of Environmental Quality (DEQ) or its officers, agents, or employees, assume any liability, directly or indirectly, for any loss due to damage to person or property caused by, resulting from, or arising out of design, installation, maintenance, or operation of the proposed equipment.</p> <p>This permit will expire if construction has not begun within two years of its issue date or if construction is suspended for one year.</p> <p>This permit has been granted on the basis of design information presented with its application. Changes in design, equipment or operations may be considered a modification. Modifications are subject to DEQ review in accordance with IDAPA 58.01.01.200 through 228 of the Rules for the Control of Air Pollution in Idaho.</p>			
 DAN PITMAN, P.E., PERMIT WRITER	DATE ISSUED	August 14, 2007	
	DATE REVISED	December 14, 2011	
 MIKE SIMON, STATIONARY SOURCE MANAGER	DATE EXPIRED	August 14, 2012	

PERMIT TO CONSTRUCT SCOPE 3
POLYSILICON FACILITY EMISSIONS CAP 4
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PERMIT TO CONSTRUCT SCOPE

Purpose

1. This is a revision of a permit to construct for a polysilicon manufacturing facility
2. Those permit conditions that have been modified or revised by this permitting action are identified by the permit issue date citation located directly under the permit condition and on the right hand margin.
3. This PTC replaces Permit to Construct No. P-2008.0049, issued on August 14, 2007.
4. The emission sources regulated by this permit are listed in the following table.

Table 1 SUMMARY OF REGULATED SOURCES

Source Descriptions	Emission Controls
Facility Emission Cap The facility emissions cap applies to all regulated sources at the facility, including boilers, generators, and manufacturing operations.	
Metallurgical Silicon Storage and Transfer/Lime Silo	Baghouses
Polysilicon Production	Scrubbers
Hot Oil Heater, and 3 Boilers	None
Diesel Firewater Pump Engine	None
Methane Reformer (Hydrogen generation)	None
Laboratory	Scrubber

POLYSILICON FACILITY EMISSIONS CAP

Process Description

5. Process Description

Hoku Materials (Hoku) will produce up to 4,000 metric tons per year purified silicon (polysilicon) in a process called chemical vapor deposition. Raw materials used in the production of polysilicon are metallurgical silicon, hydrochloric acid, and hydrogen. Emissions from handling metallurgical grade silicon will be controlled by a baghouse and emissions from the polysilicon production process will be controlled by wet scrubbers.

Metallurgical silicon and hydrochloric acid are reacted in a fluidized bed reactor to produce trichlorosilane (TCS); some silicon tetrachloride (STC) is also produced. TCS and STC are separated and stored. TCS is heated and mixed with hydrogen in a batch reactor, and polysilicon is produced by a process called chemical vapor deposition. Most of the reactor off-gases are recovered in a vent gas recovery system and recirculated back into the process. STC is reacted with hydrogen to produce TCS to be used in the batch reactors.

6. Emission Controls Description

Table 2 FACILITY EMISSIONS DESCRIPTION

Emissions Unit / Process	Emissions Control Device
Silicon Storage Bin	Baghouse
Primary Silicon Feed Bin	Baghouse
Secondary Silicon Feed Bin	Baghouse
Lime Silo	Baghouse
Polysilicon Production – 10.96 Metric Tons/Day <ul style="list-style-type: none"> • HCl storage and transfer • Trichlorosilane Production • Trichlorosilane Purification • Trichlorosilane Storage • Polysilicon Reaction • Silicon Tetrachloride storage and Hydrogenation • Vent Gas Recovery 	Scrubbers
Hot Oil Heater - 89.2 MMBtu/hr, Natural Gas	None
HVAC Boiler - 10 MMBtu/hr	None
Wastewater Boiler – 8 MMBtu/hr, Natural Gas	
HCL Boiler – 8 MMBtu/hr, Natural Gas	
Methane Reformer ~ 12.5 MMBtu/hr, Natural Gas Usage; ~ 6 MMBtu/hr is combusted and the remainder is used to produce hydrogen	
Emergency Generators (3 - 2,000 Kw each)	None
Diesel Firewater Pump – 400 Hp	None
Cooling Tower	None
Relief Vent Valves	Relief Vent Valve Scrubber
Laboratory	Laboratory Scrubber

[12/14/11]

Emission Limits

7. Criteria Pollutant and HAP Facility Emissions Cap

Emissions from the Hoku Materials facility shall not exceed any corresponding facility emission cap (FEC) limits listed in Table 3.

Table 3 FEC EMISSIONS LIMITS¹

Source Description	PM/ PM ₁₀	SO ₂	NO _x	VOC	CO	Individual HAP	Aggregated HAPs
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
Total Facility Emissions Cap	24.56	6.53	83.03	5.49	46.09	5.83	6.72

1) Emission limits are in tons per consecutive 12-calendar month period.

Facility Emissions Cap Monitoring and Recordkeeping Requirements

8. Hot Oil Heater and Boiler

The permittee shall monitor and record the amount of natural gas consumed each calendar month. The permittee shall calculate and record rolling 12-calendar month NO_x, CO, SO₂, VOC, PM₁₀, PM, maximum individual HAPs, and aggregated HAPs emissions based on fuel consumption in the natural gas combustion sources and manufacturer supplied emissions factors, U.S. EPA AP-42 emission factors or DEQ approved alternative.

[12/14/11]

9. Metallurgical Silicon Storage and Handling/Lime Storage Silo

- The permittee shall maintain documentation on-site of the flow rate of vent gases from the Silicon Bin Vent, Silicon Primary Hopper, Silicon Secondary Hopper and Lime Storage Silo vent. The flow rate shall be recorded in dry standard cubic feet per minute (dscf/min).
- The permittee shall maintain documentation on-site of manufacturer guarantees that each of the baghouses controlling emissions from the Silicon Bin Vent, Silicon Primary Hopper, Silicon Secondary Hopper, and Lime Storage Silo vent will control PM₁₀ emissions at a rate of 0.02 grains per dry standard cubic foot (gr/dscf) or less.
- The permittee shall calculate a pounds per hour emission rate by multiplying the manufacturer guaranteed emissions in grains per dry standard cubic foot by the flow rate of vent gases in dry standard cubic feet. The permittee shall record the result in pounds per hour of PM and PM₁₀ emissions for the Silicon Bin Vent, Silicon Primary Hopper, Silicon Secondary Hopper, and Lime Storage Silo vent.
- The permittee shall monitor and record the hours of operation of the Silicon Bin Vent, Silicon Primary Hopper, Silicon Secondary Hopper and Lime Storage Silo vent each calendar month.
- Each month the permittee shall calculate and record rolling 12-calendar month total PM and PM₁₀ emissions from the Silicon Bin Vent, Silicon Primary Hopper, Silicon Secondary Hopper, and Lime Storage Silo vent.

10. Emergency Generators and Fire Water Pump

- The permittee shall monitor and record the hours of operation of the Emergency Generators and the Fire Water Pump engine each calendar month.
- Each calendar month the permittee shall calculate and record the rolling 12-calendar month NO_x, CO, SO₂, VOC, PM₁₀, PM, maximum individual HAP, and aggregated HAP emissions based on hours of operation and manufacturer supplied emissions factors, U.S. EPA AP-42 emission factors, or DEQ approved alternative.

[12/14/11]

11. **Cooling Tower**

Once each calendar month the permittee shall collect a sample of the cooling tower's recirculating water and have it analyzed for total dissolved solids (TDS). Monitoring and recordkeeping shall comply with Permit to Construct General Provisions. Each month the permittee shall calculate and record the rolling 12-calendar month PM and PM₁₀ emissions based on the monitored TDS concentration and U.S. EPA AP-42 emissions factors or DEQ approved alternative.

12. **Polysilicon Production Emissions**

Each calendar month the permittee shall calculate and record the rolling 12-calendar month HCL emissions from the Process Vent Gas Scrubber and Acid Vent Gas Scrubber. Calculations shall be based on the most recent emission test results conducted on the scrubbers exhaust. The permittee shall maintain documentation on site of the emission estimates. The documentation shall include any assumptions made and the calculations used to obtain the emission estimates. The documentation shall also be submitted with each annual emission inventory.

[12/14/11]

13. **Relief Valve Vent Scrubber & Laboratory Scrubber**

Each month the permittee shall calculate and record the rolling 12-calendar month emissions from the Relief Valve Vent Scrubber and the Laboratory Scrubber. The permittee shall maintain documentation on site of the emission estimates. The documentation shall include any assumptions made and the calculations used to obtain the emission estimates. The documentation shall also be submitted with each annual emission inventory.

14. **Fugitive HCl Emissions (Valves, Seals, etc.)**

The permittee shall calculate fugitive HCl emissions based on Alcon leak factors or DEQ approved alternative leak factors. The permittee shall maintain documentation on site that includes the HCl leak factors and the emission estimate calculations. The emission estimates shall be in units of pounds per calendar month. The documentation shall be made available to DEQ representatives upon request.

15. **Facility-Wide Emissions**

Monthly estimates of facility-wide actual emissions shall be aggregated to obtain a rolling 12-calendar month emissions total for each pollutant to demonstrate compliance with the annual emission limits in Permit Condition 7. Records shall be maintained on site for a period of at least five years and shall be made available to DEQ representatives upon request.

Reporting Requirements

16. The permittee shall report to DEQ the rolling 12-month total criteria pollutant and HAP emissions recorded under Permit Condition 15. The report shall be for the period July 1st through June 30th and shall be due on or before September 1st of each calendar year. All reports must be certified in accordance with the General Provisions of this permit and submitted to the following address:

DEQ Pocatello Regional Office
Attn. Air Quality Compliance
444 Hospital Way #300
Pocatello, ID 83201

General FEC Conditions

17. Notice and Record-Keeping of Estimates of Ambient Concentrations

- For facility changes that comply with the terms and conditions establishing the FEC, but are not included in the estimate of ambient concentration analysis approved for the permit establishing the FEC, the permittee shall review the estimate of ambient concentration analysis. In the event the facility change would result in a significant contribution above the design concentration determined by the estimate of ambient concentration analysis approved for the permit establishing the FEC, but does not cause or significantly contribute to a violation of any ambient air quality standard, the permittee shall provide notice to DEQ in accordance with IDAPA 58.01.01.181.01.b. The permittee shall record and maintain documentation of the review on site.
- Estimates of ambient concentrations shall be consistent with the estimate of ambient concentration analysis approved for the permit establishing the FEC unless DEQ determines that other technical methods are appropriate. Ambient impact analyses conducted by the permittee to comply with IDAPA 58.01.01.181 after December 9, 2006, shall be performed using the most current EPA-approved regulatory guideline model (such as AERMOD-Prime). The permittee is strongly encouraged to submit a modeling protocol to DEQ for review and approval prior to conducting the first modeling analyses based on the regulatory air model that is used to comply with IDAPA 58.01.01.181. The permittee shall include any changes to the facility that was not included in the originally approved estimate of ambient concentration analysis.
- The permittee shall submit a revised ambient impact modeling analysis using the most current regulatory air model for the renewal of this permit in accordance with IDAPA 58.01.01.177.02.d and IDAPA 58.01.01.179.02. The permittee is strongly encouraged to submit a modeling protocol to the Department for review and approval prior to submitting the modeling analysis with the FEC permit renewal application.

METALLURGICAL SILICON STORAGE AND TRANSFER/LIME SILO

18. Process Description

Metallurgical grade silicon from offsite transport vehicles is transferred to and stored in a bin; the bin feeds a primary and secondary feed hopper. The feed hoppers send metallurgical grade silicon to the polysilicon manufacturing process. Emissions from the bin and hoppers are controlled by a baghouse dedicated to each unit.

Lime from offsite transport vehicles is transferred to and stored in a silo. Emissions from the lime silo are controlled by a baghouse.

Table 4 METALLURGICAL SILICON HANDLING/LIME SILO DESCRIPTION

Emissions Units	Emissions Control Device
Silicon Bin	Baghouse
Primary Silicon Feed Bin	Baghouse
Secondary Silicon Feed Bin	Baghouse
Lime Silo	Baghouse

Emissions Limits

19. **Emissions Limits**

PM and PM₁₀ emissions from each baghouse on the Silicon Bin, Primary Silicon Feed Bin, Secondary Feed Bin, and the Lime Silo shall not exceed 0.02 grains per dry standard cubic foot.

20. **Opacity Limit**

Emissions from any stack, vent, or functionally equivalent opening shall not exceed 20% opacity for a period or periods aggregating more than three minutes in any 60-minute period as required by IDAPA 58.01.01.625. Opacity shall be determined by the procedures contained in IDAPA 58.01.01.625.

Operating Requirements

21. **Baghouse Specifications**

The permittee shall install and operate baghouses on the Silicon Bin, Primary Silicon Feed Bin, Secondary Feed Bin, and the Lime Silo that are guaranteed by the manufacturer to emit no more than 0.02 grains per dry standard cubic foot of PM₁₀. The permittee shall maintain documentation of the manufacturer guarantees on site and shall make them available to DEQ representatives upon request.

22. **Baghouse Operation and Maintenance Manual**

Prior to operation, the permittee shall have developed an Operations and Maintenance (O&M) manual for the baghouses which control the PM and PM₁₀ emissions from the Silicon Bin, Primary Silicon Feed Bin, Secondary Feed Bin, and the Lime Silo. The O&M manual shall describe the procedures that will be followed to comply with General Provision 2 and the manufacturer specifications for the baghouse. The manual shall contain, at a minimum, requirements for semiannual inspection of the baghouse. The inspections shall include, but not be limited to, checking the bags or cartridges for structural integrity and that they are appropriately secured in place. The manual shall remain on site at all times and shall be made available to DEQ representatives upon request.

The operating and monitoring requirements specified in the O&M manual are incorporated by reference to this permit and are enforceable permit conditions.

The O&M manual shall be submitted to DEQ at the following address. Any changes made to the O&M manual shall also be submitted.

Air Quality Permit Compliance
Department of Environmental Quality
Pocatello Regional Office
444 Hospital Way, #300
Pocatello, ID 83201

Monitoring and Recordkeeping Requirements

23. **Baghouse Inspections**

The permittee shall maintain documentation on site of the results of the semiannual baghouse inspections required by the Baghouse O&M Manual. The results of the inspection shall be documented and shall at minimum include statements about the structural integrity of the bags and whether they are appropriately secured in place. Monitoring shall comply with the Permit to Construct General Provisions.

EMERGENCY GENERATORS AND FIREWATER PUMP

24. Process Description

The permittee will install 3 emergency generators that are powered by diesel fuel engines and a fire water pump that is powered by a diesel fuel engine.

Table 5 GENERATOR AND FIRE PUMP ENGINE DESCRIPTION

Emissions Unit	Emissions Control Device
Emergency Generator Sets(3) Power: 2,000 kW each Model Year: Gen. #1- 2010, Gen #2 -2007, Gen #3 - 2007	None
Fire Pump Engine Power: 400 HP Model Year: 2009	

[12/14/11]

Emissions Limits

25. 40 CFR 60.4200 Emissions Limits For Compression Ignition Engines

Emissions from the emergency generator must comply with the emission standards for new nonroad compression ignition engines in 40 CFR 60.4202 and 60.4205.

Emissions from certified National Fire Protection Association fire pump engines after July 1, 2006 must comply with the emission standards in Table 4 to 40 CFR 60.4200.

Operating Requirements

26. 40 CFR 60.4206 Operating Requirements

Owners and operators of stationary compression ignition engines subject to emissions standards of 40 CFR 60.4205 shall achieve the emissions standards according the manufacturer's written instruction or procedures developed by the owner or operator that are approved by the engine manufacturer, over the entire life of the engine.

27. 40 CFR 60.4207 Fuel Requirements

Beginning October 1, 2007, owners and operators of stationary compression engines subject to 40 CFR 60.4200 using diesel fuel must use diesel fuel that meets the requirements of 40 CFR 80.510(a):

- Sulfur content – 500 ppm
- Cetane index of 40, or a maximum aromatic content of 35 volume percent

Beginning October 1, 2010, owners and operators of stationary compression engines subject to 40 CFR 60.4200 with cylinder displacements less than 30 liters using diesel fuel must use diesel fuel that meets the requirements of 40 CFR 80.510(b) for nonroad diesel fuel.

- Sulfur content – 15 ppm
- Cetane index of 40, or a maximum aromatic content of 35 volume percent

28. 40 CFR 60.4208 Installation Requirements

- In accordance with 40 CFR 60.4211(a), owners and operators must operate and maintain the stationary compression internal combustion engine according to the manufacturer's written instruction or procedures developed by the owner or operator that are approved by the engine manufacturer. In addition, owners and operators may only change those settings that are permitted by the manufacturer. Owners and operators must also meet the requirements of 40 CFR parts 89, 94 and/or 1068, as they apply.

- In accordance with 40 CFR 60.4211(c) the owner and operator of a 2007 model year and later emergency generator subject to the emission standards of 40 CFR 60.4002(b) must comply by purchasing an engine certified to the standards of 40 CFR 60.4002(b), for the same model year and maximum engine power. The engine must be installed and configured to the manufacturer's specifications.
- In accordance with 40 CFR 60.4211(e), emergency stationary internal combustion engines may be operated for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by federal, state, or local government, the manufacturer, the vendor, or the insurance company associated with the engine. Maintenance checks and readiness testing is limited to 100 hours per year. There is no time limit on the use of emergency engines in emergency situations. Anyone may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that federal, state, or local standards require maintenance and testing beyond 100 hours per year. Any operation of the emergency generator other than emergency operation, and maintenance and testing as permitted in this section, is prohibited.

29. **Compliance with 40 CFR 60.200**

Owners and operators of stationary compression ignition engines subject to emissions standards of 40 CFR 60.4200 shall install a non-resettable hour meter prior to startup of the engine.

30. **Compliance with 40 CFR 60.200**

Should there be a conflict between this permit and 40 CFR 60.4200, the Code of Federal Regulations shall govern.

Monitoring and Recordkeeping Requirements

31. **40 CFR 60.4209 Monitoring Requirements**

Owners and operators of stationary compression ignition engines subject to emissions standards of 40 CFR 60.4200 shall install a non-resettable hour meter prior to startup of the engine.

Reporting Requirements

32. The permittee shall comply with all applicable notification requirements of 40 CFR 60.7:

- Notification of the date of construction of the affected units, no later than 30 days after such date;
- Notification of the date of initial startup, postmarked within 15 days of such date;
- Notification of any physical and operational changes which may increase emissions.

POLYSILICON PRODUCTION

33. Process Description

Polysilicon is produced in a batch process where pure trichlorosilane gas and hydrogen are combined in reactors where silicon is deposited onto a filament rod inside the reactors. The process is called chemical vapor deposition. Off-gases from the reactors are sent to an acid vent gas recovery system that recycles the majority of the gases back into the process, gases also exhaust through the process vent gas scrubber. The process consists of the emissions units listed in Table 6.

34. Emissions Control Description

Table 6 POLYSILICON PRODUCTION DESCRIPTION

Emissions Unit / Process	Emissions Control Device
Trichlorosilane production and purification	Acid Vent Gas Scrubber and/or Process Vent Gas Scrubber
Trichlorosilane storage	
Silicon tetrachloride storage	
Silicon tetrachloride hydrogenation	
Polysilicon reaction/production (chemical vapor deposition)	
Vent Gas Recovery Unit	
HCL Supply	

Emissions Limits

35. Emissions from the Acid Gas and Process Vent Gas Scrubber stacks shall not exceed any corresponding emissions rate limits listed in Table 7.

Table 7 PROCESS VENT AND ACID VENT SCRUBBER EMISSIONS LIMITS¹

Source Description	HCl
	lb/hr ²
Acid Vent Gas Scrubber	0.29
Process Vent Gas Scrubber	0.04

- 1) In absence of any other creditable evidence, compliance is assured by complying with this permits operating, monitoring and record keeping requirements.
 2) Hydrogen chloride as determined through an approved source testing method.

[12/14/11]

Operating Requirements

36. Polysilicon production shall not exceed 11.4 metric tons per day. [12/14/11]
37. Emissions from the polysilicon production process shall be controlled by wet scrubbers. [12/14/11]
38. The Process Vent Gas scrubbing system and Acid Vent Gas scrubbing system shall each consist of two stages of scrubbing. The first stage shall include a spray chamber and the second stage shall consist of a packed bed scrubber. [12/14/11]

39. Process Vent Gas Spray Chamber

Scrubbing media introduced to the Process Vent Gas scrubber systems spray chamber shall be sodium hydroxide solution. The scrubbing media flow rate and scrubbing media pH shall be maintained equal to or at a higher value than recorded during the most recent performance test. The permittee shall maintain a copy of the most recent performance test results. The performance test results shall include the scrubbing media flow rate in gallons per minute and the pH that was recorded during the test.

[12/14/11]

40. **Acid Vent Gas Spray Chamber**

Scrubbing media introduced to the Process Vent Gas scrubber systems spray chamber shall be water. The scrubbing media flow rate shall be maintained equal to or at a higher value than recorded during the most recent performance test. The permittee shall maintain a copy of the most recent performance test results. The performance test results shall include the scrubbing media flow rate in gallons per minute that was recorded during the test.

[12/14/11]

41. **Acid Vent Gas and Process Vent Gas Packed Bed Scrubbers**

The packed bed scrubbers operating parameters shall be maintained as follows:

- The pressure drop across the Acid Vent Gas and Vent Gas Packed Bed Scrubbers shall not drop below 80% of the value recorded in inches of water during the most recent performance test that demonstrated compliance.
- The sodium hydroxide scrubbing liquid flow rate to the Process Vent Gas Packed Bed Scrubber shall be equal to or greater than the gallons per minute value recorded during the most recent performance test that demonstrated compliance.
- The sodium hydroxide scrubbing liquid flow rate to the Acid Vent Gas Packed Bed Scrubber shall be equal to or greater than 231 gallons per minute and shall not be less than the value recorded during the most recent source test.
- The scrubbing liquid pH that is used in the Acid Vent Gas and Vent Gas Packed Bed Scrubbers shall be equal to or greater than to the value recorded during the most recent performance test that demonstrated compliance.

The permittee shall maintain a copy of the most recent performance test results. The performance test results shall include the scrubbing media flow rate, pressure drop and pH that was recorded during the tests.

With the exception that the acceptable scrubbing media flow rate to the Acid Vent Gas Scrubber shall not be less than a minimum of 231 gallons per minute, as an alternative to the scrubber operating parameters required by this permit, the permittee may establish new parameters by conducting a performance test that demonstrates compliance with the respective HCL emissions rate limits while operating at the alternative parameters. The performance test shall be conducted in accordance with the Test Methods and Procedures specified in the Rules (IDAPA 58.01.01.157) and in accordance with a DEQ approved source test protocol. All operating parameters specified in this permit condition shall be monitored and recorded every 15 minutes during each test run. The permittee may request to operate outside of the operating ranges specified by this permit during the performance test by submitting a written source test protocol to DEQ for approval and requesting to operate under alternative parameters during the duration of the test. Once the source test is completed, the permittee may request in writing to operate in accordance with alternative parameters (including those specified for the spray chambers). The request shall include a source test report and justification for the alternative parameters. Upon receiving DEQ written approval of the source test and the requested alternative operating parameters, the permittee shall operate in accordance with those DEQ approved alternative parameters. A copy of DEQ's approval shall be maintained on-site with a copy of this permit.

[12/14/11]

Monitoring and Recordkeeping Requirements

42. **Polysilicon Monitoring**

The permittee shall monitor and record the amount of polysilicon produced, in metric tons, during each calendar day. Monitoring may consist of production rate calculations.

[12/14/11]

43. **Acid Vent Gas and Process Vent Gas Spray Chamber Monitoring**

The permittee shall:

- Monitor and record the scrubbing liquid flow rate in gallons per minute to the Acid Vent Gas and Process Vent Gas spray chambers once each calendar week.
- Monitor and record the scrubbing liquid pH to the Process Vent Gas spray chamber once each calendar week.

[12/14/11]

44. **Acid Vent Gas and Process Vent Gas Packed Bed Scrubber Monitoring**

The permittee shall:

- Monitor and record the pressure loss of the gas stream through each packed bed scrubber in inches of water once each week.
- Monitor and record the scrubbing media flow rate to each packed bed scrubber in gallons per minute once each week.
- Monitor and record the scrubbing liquid pH at the inlet of each packed bed scrubber once each week.

[12/14/11]

45. **Acid Vent Gas and Process Vent Gas Packed Bed Scrubbing Systems Emission Testing**

Within 180 days of initial startup of any emission unit that vents to the Acid Vent Gas Scrubber or Process Vent Gas scrubber, the permittee shall conduct HCL emission testing on the Acid Vent Gas scrubber stack and Process Vent Gas scrubber stack; and

The permittee shall conduct HCL emission testing on the Acid Vent Gas scrubber stack and Process Vent Gas scrubber stack within 180 days of increasing the facilities production capacity due to the addition of 5 polysilicon reactors; testing shall occur within 180 days of the date of the addition of the fifth reactor; and

The permittee shall conduct HCL emission testing on the Acid Vent Gas scrubber stack and Process Vent Gas scrubber stack at least once each five years.

The permittee is encouraged to submit a source testing protocol for approval 30 days prior to conducting each performance test.

The permittee shall test in accordance with IDAPA 58.01.01.157 and the General Provisions of this permit. General Provisions include notification requirements, testing procedures and reporting requirements.

The permittee shall monitor and record the following during the performance test:

- Monitor and record the scrubbing liquid flow rate in gallons per minute to the Acid Vent Gas and Process Vent Gas spray chambers once each 15 minutes.
- Monitor and record the scrubbing liquid pH to the Process Vent Gas spray chamber once each 15 minutes.
- Monitor and record the pressure loss of the gas stream through each packed bed scrubber in inches of water once each 15 minutes.
- Monitor and record the scrubbing media flow rate to each packed bed scrubber in gallons per minute once each 15 minutes.
- Monitor and record the scrubbing liquid pH at the inlet of each packed bed once each 15 minutes.

The source test shall be conducted under “worst case normal” conditions as required by IDAPA 58.01.01.157 and the General Provisions of this permit; the source test report shall contain documentation that the test was conducted under these conditions. The report shall also include the scrubbers operating parameters that were monitored during the test.

[12/14/11]

NATURAL GAS FIRED HOT OIL HEATER AND BOILERS

46. **Process Description**

The permittee will operate a Hot Oil Heater and Boilers to provide for process heat needs.

47. **Emissions Control Description**

Table 8 HEATER AND BOILER DESCRIPTION

Emissions Unit / Process	Emissions Control Device
Hot Oil Heater Fuel: Natural Gas Size: 89.2 MMBtu/hr	None
HVAC Boiler Fuel: Natural Gas Size: 10 MMBtu/hr	
Waste Water Boiler Fuel: Natural Gas Size: 8 MMBtu/hr	
HCL Boiler Fuel: Natural Gas Size: 8 MMBtu/hr	

[12/14/11]

Operating Requirements

48. **Fuel Limitations**

The Hot Oil Heater and Boilers shall combust natural gas exclusively.

49. **Compliance with 40 CFR 60.48c**

Should there be a conflict between Permit Conditions 49 through 51 and 40 CFR 60.40c, the Code of Federal Regulations shall govern.

Monitoring and Recordkeeping Requirements

50. **Fuel Monitoring - 40 CFR 60.48c(g)(1)**

The permittee shall monitor the amount of natural gas combusted in each affected emission unit each day in accordance with 40 CFR 60.48c(g)(1) or may elect to: record and maintain records of the amount of fuel combusted during each calendar month in accordance with 40 CFR 60.48c(g)(2); or to record and maintain records of the total amount fuel delivered to that property during each calendar month in accordance with 40 CFR 60.48c(g)(3).

Reporting Requirements

51. **Reporting**

The permittee shall comply with all applicable notification requirements of 40 CFR 60.48c(a) and 40 CFR 60.7:

- Notification of the date of construction and the heat input capacity of the affected units, no later than 30 days after such date;
- Notification of the date of initial startup, postmarked within 15 days of such date;
- Notification of any physical and operational changes which may increase emissions.

LABORATORY SCRUBBER

52. **Process Description**

Emission from the laboratory will be controlled by a laboratory scrubber. Nitric acid and hydrofluoric acid is used for lab analysis and sample etching.

53. **Emissions Control Description**

Table 9 LABORATORY DESCRIPTION

Emissions Units	Emissions Control Device
Laboratory	Wet Scrubber

Operating Requirements

54. **Nitric acid and Hydrofluoric Acid**

The permittee shall not use more than:

- 7.4 gallons of nitric acid per calendar day;
- 6.7 gallons of hydrofluoric acid per calendar day.

[12/14/11]

55. **Manufacturer Guarantee**

The permittee shall maintain documentation on site from the manufacturer that guarantees the laboratory scrubber will control nitric acid and hydrofluoric acid at a minimum of 85 percent removal efficiency. The manufacturer's guarantees shall be made available to DEQ representatives upon request.

[12/14/11]

56. **O & M Manual**

Within 60 days of permit issuance the permittee shall have developed and submitted to DEQ an Operations and Maintenance (O&M) manual for the wet scrubbers which describes the procedures that will be followed to comply with General Provision 2 of this permit and the manufacturer specifications for the air pollution control device. At a minimum the O&M manual shall contain the manufacturer's recommended minimum values that shall be maintained for each of the following operating parameters:

- Scrubbing media flow rate in gallons per minute,
- Scrubbing Media pH
- Pressure drop across scrubber in inches of water
- Requirements to monitor and record the parameters listed above no less frequently than once every two calendar weeks.

All monitoring records shall be maintained on site for a period of 5 years and shall be made available to DEQ representatives upon request.

The contents of the O&M manual shall be based on manufacturer's specifications. A copy of the manufacturer's specifications shall be included with the O&M manual and both shall be made available to DEQ representatives upon request.

The operating and monitoring requirements specified in the O&M manual are incorporated by reference to this permit and are enforceable permit conditions.

The O&M manual shall be submitted to DEQ at the following address. Any changes made to the O&M manual shall also be submitted.

Air Quality Permit Compliance
Department of Environmental Quality
Pocatello Regional Office

444 Hospital Way, #300
Pocatello, ID 83201

Monitoring and Recordkeeping Requirements

57. **Nitric Acid and Hydrofluoric Acid**

The permittee shall monitor and record the gallons of nitric acid and hydrofluoric acid used per calendar day. The records shall be maintained on site for a period of five years and made available to DEQ representatives upon request.

PERMIT TO CONSTRUCT GENERAL PROVISIONS

General Compliance

58. The permittee has a continuing duty to comply with all terms and conditions of this permit. All emissions authorized herein shall be consistent with the terms and conditions of this permit and the Rules for the Control of Air Pollution in Idaho. The emissions of any pollutant in excess of the limitations specified herein, or noncompliance with any other condition or limitation contained in this permit, shall constitute a violation of this permit and the Rules for the Control of Air Pollution in Idaho, and the Environmental Protection and Health Act, Idaho Code §39-101, et seq.

[Idaho Code §39-101, et seq.]

59. The permittee shall at all times (except as provided in the Rules for the Control of Air Pollution in Idaho) maintain in good working order and operate as efficiently as practicable, all treatment or control facilities or systems installed or used to achieve compliance with the terms and conditions of this permit and other applicable Idaho laws for the control of air pollution.

[IDAPA 58.01.01.211, 5/1/94]

60. Nothing in this permit is intended to relieve or exempt the permittee from the responsibility to comply with all applicable local, state, or federal statutes, rules and regulations.

[IDAPA 58.01.01.212.01, 5/1/94]

Inspection and Entry

61. Upon presentation of credentials, the permittee shall allow DEQ or an authorized representative of DEQ to do the following:

- Enter upon the permittee's premises where an emissions source is located or emissions related activity is conducted, or where records are kept under conditions of this permit;
- Have access to and copy, at reasonable times, any records that are kept under the conditions of this permit;
- Inspect at reasonable times any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit; and
- As authorized by the Idaho Environmental Protection and Health Act, sample or monitor, at reasonable times, substances or parameters for the purpose of determining or ensuring compliance with this permit or applicable requirements.

[Idaho Code §39-108]

Construction and Operation Notification

62. The permittee shall furnish DEQ written notifications as follows in accordance with IDAPA 58.01.01.211:

- A notification of the date of initiation of construction, within five working days after occurrence; except in the case where pre-permit construction approval has been granted then notification shall be made within five working days after occurrence or within five working days after permit issuance whichever is later;
- A notification of the date of any suspension of construction, if such suspension lasts for one year or more;
- A notification of the anticipated date of initial start-up of the stationary source or facility not more than sixty days or less than thirty days prior to such date; and

- A notification of the actual date of initial start-up of the stationary source or facility within fifteen days after such date.

[IDAPA 58.01.01.211, 5/1/94]

Performance Testing

63. If performance testing (air emissions source test) is required by this permit, the permittee shall provide notice of intent to test to DEQ at least 15 days prior to the scheduled test date or shorter time period as approved by DEQ. DEQ, at its option, may have an observer present at any emissions tests conducted on a source. DEQ requests that such testing not be performed on weekends or state holidays.
64. All performance testing shall be conducted in accordance with the procedures in IDAPA 58.01.01.157. Without prior DEQ approval, any alternative testing is conducted solely at the permittee's risk. If the permittee fails to obtain prior written approval by DEQ for any testing deviations, DEQ may determine that the testing does not satisfy the testing requirements. Therefore, at least 30 days prior to conducting any performance test, the permittee is encouraged to submit a performance test protocol to DEQ for approval. The written protocol shall include a description of the test method(s) to be used, an explanation of any or unusual circumstances regarding the proposed test, and the proposed test schedule for conducting and reporting the test.
65. Within 30 days following the date in which a performance test required by this permit is concluded, the permittee shall submit to DEQ a performance test report. The written report shall include a description of the process, identification of the test method(s) used, equipment used, all process operating data collected during the test period, and test results, as well as raw test data and associated documentation, including any approved test protocol.

[IDAPA 58.01.01.157, 4/5/00]

Monitoring and Recordkeeping

66. The permittee shall maintain sufficient records to ensure compliance with all of the terms and conditions of this permit. Records of monitoring information shall include, but not be limited to the following: (a) the date, place, and times of sampling or measurements; (b) the date analyses were performed; (c) the company or entity that performed the analyses; (d) the analytical techniques or methods used; (e) the results of such analyses; and (f) the operating conditions existing at the time of sampling or measurement. All monitoring records and support information shall be retained for a period of at least five years from the date of the monitoring sample, measurement, report, or application. Supporting information includes, but is not limited to, all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation and copies of all reports required by this permit. All records required to be maintained by this permit shall be made available in either hard copy or electronic format to DEQ representatives upon request.

[IDAPA 58.01.01.211, 5/1/94]

Excess Emissions

67. The permittee shall comply with the procedures and requirements of IDAPA 58.01.01.130-136 for excess emissions due to startup, shutdown, scheduled maintenance, safety measures, upsets and breakdowns.

[IDAPA 58.01.01.130-136, 4/5/00]

Certification

68. All documents submitted to DEQ, including, but not limited to, records, monitoring data, supporting information, requests for confidential treatment, testing reports, or compliance certification shall contain a certification by a responsible official. The certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document(s) are true, accurate, and complete.

[IDAPA 58.01.01.123, 5/1/94]

False Statements

69. No person shall knowingly make any false statement, representation, or certification in any form, notice, or report required under this permit, or any applicable rule or order in force pursuant thereto.

[IDAPA 58.01.01.125, 3/23/98]

Tampering

70. No person shall knowingly render inaccurate any monitoring device or method required under this permit or any applicable rule or order in force pursuant thereto.

[IDAPA 58.01.01.126, 3/23/98]

Transferability

71. This permit is transferable in accordance with procedures listed in IDAPA 58.01.01.209.06.

[IDAPA 58.01.01.209.06, 4/11/06]

Severability

72. The provisions of this permit are severable, and if any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

[IDAPA 58.01.01.211, 5/1/94]