Responsiveness Summary

REC Solar Grade Silicon, LLC
Draft Permit Hearing
and Written Comment Response

Prepared by:

Washington State Department of Ecology
Air Quality Program

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Response to REC Comments, Submitted 4/22/2009

REC Comment 1:

Proposed change: REC requests that the control equipment description listed for emission points A12a, A12b, A12c, B26, and C26 (as characterized in the equipment summary table at the beginning of the Preliminary Determination) be modified to establish consistency with the corresponding approval conditions. The control equipment description for these emission points in the Preliminary Determination includes "work practice to maintain Total Dissolved Solids (TDS) below 2500 ppm"; however, a TDS limit is not established in the corresponding approval conditions. Accordingly, REC requests that the TDS language be removed from the equipment summary table.

Response:

Ecology agrees that the table referenced should be consistent with the approval conditions. We have added a 2500 ppmw TDS limit and monitoring requirements for the cooling tower(s) blow-down.

REC Comment 2:

Proposed change: REC requests that the term "immediately" in the first sentence of Condition 2.1 is replaced with the phrase "as soon as reasonably practicable, but not later than by the end of the following business day."

Response:

Ecology agrees that the word "immediately" is not defined in this approval order. We have clarified it to be within two hours of an incident with any unscheduled releases. REC's public (and Ecology) notification history has resulted in a considerable amount of public commentary on this condition. It has been rewritten to address those as well as REC's concerns.

REC Comment 3:

Proposed change: Per Condition 2.2, excess emissions are defined as "any criteria or toxic air pollutant emissions that are released from any emission unit or from the failure of any plant component at a rate or concentration above the emission factors approved by Ecology for reporting under Condition 23 of this determination." Condition 23.1 states that "the list of approved [emission] factors will be provided by Ecology to REC prior to the first annual report

and may be modified only upon written approval from Ecology."[1] REC requests that the definition of excess emissions in Condition 2.2 be updated as follows, to be consistent with the definition established in WAC 173-400-030(29): "…at a rate or concentration in excess of any applicable emission standard."

Response:

Ecology has deleted Condition 2.2 of the preliminary determination. By clarifying condition 2.1 to include <u>any</u> release, there is no need to define excess emissions in this approval order.

<u>REC Comment 4</u>:

Proposed change: Condition 2.3 states that "in the event of a control device upset or malfunction, the process equipment controlled by that device shall be shut-down as soon as safely possible..." REC requests that this language be modified as follows: "In the event of a control device upset or malfunction, ***best management practices shall be employed to minimize emissions from the process equipment controlled by that device.***"

Response:

Ecology has no information to suggest that REC can or will minimize emissions in the event of a control device malfunction, nor to support this proposed change. To assist REC with a specific, preplanned response to a control device failure, Ecology declines to change this condition.

<u>REC Comment 5</u>:

Proposed change: REC requests that the last sentence of Condition 2.3 be removed. The specific language that REC requests Ecology to remove is as follows: "Excess emissions resulting from the shut-down of any equipment, or the venting of any substance from any equipment during an emergency upset procedure shall be documented as an excess emission as described above regardless of the emission rate or concentration of the release."

Response:

Ecology has clarified Condition 2.1 to avoid the use of term "excess emissions" and removed the definition at 2.2. We have also clarified this condition to avoid use of the term "excess emissions."

[1] Per Condition 23, reports are due within 30 days following the end of the calendar year. Assuming that the final approval order for Plant 4 is issued to REC in 2009, the first annual report would be due by January 30, 2010.

REC Comment 6:

Proposed change: REC requests that language be added to Condition 2.4 to clarify that the conversion of silane to fine particulate matter (in the form of silicon dioxide) is a kinetic reaction and that the reaction is not instantaneous but rather may take several hours to complete. However, for the purposes of determining annual emissions from REC's Moses Lake facility for annual emission reports and evaluating ambient pollutant concentrations near the facility, REC will assume that all silane is in the form of $PM_{2.5}$.

Response:

Ecology has clarified this condition to require that silane be evaluated both as the gas and as particulate matter for the purposes of emission estimates.

REC Comment 7:

Proposed change: REC requests that delivery receipts for diesel content certifications be maintained on-site for a period of three (3) years. Condition 3.6 does not currently detail a specific retention time period.

Response:

Ecology agrees there should be a period specified for retention of records. For synthetic minor facilities and their AOP counterparts, this is no less than 60 months. This change has been made.

REC Comment 8:

Proposed change: REC requests that the grain-loading limit established by Condition 4.1.1 for emission points A1a, A1b, A1d, A13, and A32 be updated from 0.005 gr/dscf to 0.01 gr/dscf. By updating the grain-loading limit established by Condition 4.1.1, the annual emission limits established by Conditions 4.1.2, 4.1.3, 4.1.4, 4.1.5, and 4.1.6 for the same units will also be updated, as shown in Table 1.

Response:

This request was discussed on several occasions during the 3 year permitting effort leading to the Plant 4 permit. REC was offered the opportunity to demonstrate that the two expansions (Plant 3 and Plant 4) of the facility did not increase potential emissions from the equipment in Plant 1. Ecology has received no information to determine the emission rates or concentrations from these fabric filters as they have been operated, nor any information

to determine how they will perform in the future. Fabric filters in similar service at other facilities have been shown to readily satisfy the requirement that this comment requests be relaxed. Ecology declines to make the requested change.

REC Comment 9:

Proposed change: REC requests that the June 26, 2009 date for filter failure instrumentation addition, listed in Condition 4.2, be extended to December 31, 2010.

Response:

Ecology agrees that REC may need additional time to install this instrumentation and has edited this condition to allow one calendar year from issuance of the Approval Order.

REC Comment 10:

Proposed change: REC requests that in Conditions 4.1.1 and 5.1, only Method 5 be required to measure particulate matter emissions. Accordingly, REC requests that the requirement to use Method 202 be removed from these conditions.

Response:

Ecology has seen no demonstration that the control devices listed will emit no condensable particulate matter. Ecology declines to make this change.

REC Comment 11:

Proposed change: The third sentence of Conditions 4.3.1, 5.14.1, 7.3.6, 9.2.4, and 11.2.6 states that "the presence of visible emissions from a filtration system at the facility shall trigger corrective measures defined in the facility operating and maintenance manual required in Condition 21 of this approval order." REC requests that this sentence be modified as follows: "The presence of visible emissions from a filtration system at the facility shall trigger ***a Method 9 reading and, if necessary,*** corrective measures…"

For consistency with the change requested above, REC requests that Condition 21.6 be modified as follows: "…The CMMS shall at a minimum include corrective measures for filtration systems in the event that monthly Method 22 surveys discover visible emissions from any filtration system at the facility ***and subsequent Method 9 readings confirm the occurrence of an exceedance of an opacity standard.***"

For consistency with the changes requested above, REC requests that Condition 22.1.2.2 be modified as follows: "The records to be kept shall including the following: Conditions ***4.3.1***,

5.14.1, ***7.3.6***, 9.2.4, and 11.2.6, records of opacity observations during monthly Method 22 surveys ***and follow-up Method 9 readings, as required***."

Response:

Ecology wrote this condition to allow REC to avoid Method 9 readings on all of the many fabric filter exhausts at the facility. A Method 9 evaluation in accordance with 40 CFR 60 requires an hour to perform and requires that REC have certified readers available during all times of operation. Having received no previous information that this condition as written would be a problem for REC, Ecology declines to relax it as suggested.

REC Comment 12:

Proposed change: REC requests that the grain-loading limit established by Condition 5.1 for emission points C36A, C36B, and C37 be updated from 0.005 gr/dscf to 0.01 gr/dscf. By updating the grain-loading limit established by Condition 5.1, the hourly emission limits established by Conditions 5.10, 5.11, and 5.12 for the emission points C36A, C36B, and C37 will also be updated, as shown in Table 1.

Response:

Ecology declines to make this change. REC has provided information suggesting that the vendor of these filters tested their performance on a sample provided to him by REC, and that the filters performed better than the limit and were expected to continue to after scale-up. The vendor was then encouraged not to guarantee the BACT-level grain loading as it might be too restrictive in this Order. Different from a "rule of thumb", the presumptive BACT values used as limits in this Order are those readily achieved in practice by other similar devices in similar service. REC has provided no compelling argument to support relaxing these limits.

REC Comment 13:

Proposed change: REC requests that the hourly emission rates established by Condition 5.7, 5.8, and 5.9 for emission points C2, C3, and C4, be updated as shown in Table 1.

Response:

Ecology agrees to this request.

REC Comment 14:

Proposed change: REC requests that the term "PD" in the first sentence of Condition 5.14.1 be replaced with the term "permit."

Response:

Ecology will alter the terminology referencing the type of document upon issuance. The Preliminary Determination (or PD) becomes an Approval Order.

REC Comment 15:

Proposed change: REC requests that the first sentence in Condition 6.2.7.1 be modified from the current language ("within 180 days of the SMR systems becoming operational…") to "within 180 days of ***each SMR system*** becoming operational…"

Response:

Ecology agrees to this suggestion.

REC Comment 16:

Proposed change: REC requests that Conditions 6.2.7.2 and 6.2.7.4 be removed from the permit.

Response:

Ecology declines to remove these conditions entirely but agrees that, should the emission points prove to emit at the low rates claimed, the ongoing testing should not be necessary. The conditions have been modified to reflect this.

REC Comment 17:

Proposed change: REC requests that the hourly emission rates of NO_x and CO from the emission points A30 and A31 established in Conditions 7.1.2 and 7.1.3 be updated as shown in Table 1.

Response:

The values REC requests for these hot oil heaters are the result of errors in the original calculations in Approval Order 95AQ-E146. Ecology declines to reproduce the error in this document.

REC Comment 18:

Proposed change: REC requests that Conditions 7.1.5, 13.5, 15.1.2, 15.1.3, and 15.2.7 be removed from the permit.

Response:

Plant 4 permitting relied on the same claims and, in some cases provided information that was not explained or provided during Plant 3 permitting. It is unsupportable for REC to insist that because a device was permitted with inadequate or inaccurate information in the past, those permit limits are unalterable upon receipt of better information or reflection. REC becomes a synthetic minor source for NOx (among other pollutants) upon issuance of the Plant 4 Order. For synthetic minor sources, additional monitoring of all activities can be expected. Ecology declines to make these changes.

REC Comment 19:

Proposed change: REC requests that the Plant 3 hot oil heaters, identified in Condition 7.1.6 as B-23, B-24, and B-25 and defined through Condition 7.1.12.2, be allowed to remain as previously permitted in Conditions 6.2 through 6.2.5.2 in Approval Order 07AQ-E223.

Response:

Ecology has repeatedly tried to point out to REC that the vendor calculations for Plant 3 hot oil heaters contain errors. In addition, REC has not plumbed the Plant 3 heaters for hydrogen fuel nor entered into any contractual agreement to acquire said fuel. On the bases that information provided to allow the high NOx operation of the Plant 3 hot oil heaters was inaccurate and that there is no confirmed plan for acquiring hydrogen fuel, Ecology declines to change this condition.

REC Comment 20:

Proposed change: REC requests that the second period "." be removed from Condition 7.1.11.

Response:

Ecology made the correction.

REC Comment 21:

Proposed change: REC requests that the grain-loading limit, for emission point A36 established in Condition 7.3.1 be updated as shown in Table 1.

Response:

REC has provided no indication that A-36 will exhibit no emission increase as a result of the Plant 3 and 4 expansion. Additionally, A-36 has never been sampled to determine its actual emission rates under varied loadings. Ecology declines to make the proposed change.

REC Comment 22:

Proposed change: REC requests that the PM_{10} emission limits for emission point A36 established in Conditions 7.3.2 be updated as shown in Table 1.

Response:

For the same reason as provided in the response to Comment 21, Ecology declines.

REC Comment 23:

Proposed change: REC requests a time extension from the current implementation date of June 26, 2009, identified in Condition 7.3.4, to December 31, 2010.

Response:

Ecology agrees more time may be necessary to implement this requirement and will allow one calendar year from the date of issuance of this approval order.

REC Comment 24:

Proposed change: REC requests that Condition 7.5 be removed from the preliminary determination.

Response:

Ecology made the correction. This Condition number was an artifact of MS Word outline numbering.

REC Comment 25:

Proposed change: REC requests that the hourly PM_{10} emission rate for emission points B19 and B18 established in Conditions 7.6.3 and 7.7.2, respectively, be updated as shown in Table 1.

Response:

These emission rates and concentrations from B-18 and B-19 have been the source of discussion since the start of the Plant 3 permitting process in 2006. REC has provided no compelling justification that would allow Ecology to agree that REC's requested limits reflect BACT or t-BACT. The original engineering for Plant 1 in 1984 indicated a single-stage scrubbing system would perform better than the multi-stage systems proposed here. REC's applications suggest that its new scrubbers will perform no better than the maximum emission rates allowable for an uncontrolled vent in the State of Washington. Ecology disagrees that the proposed level of performance represents BACT or t-BACT. Ecology declines to make this change.

REC Comment 26:

Proposed change: REC requests that the hydrogen chloride (HCl) exhaust concentration limit for emission points B19 and B18 established in Conditions 7.6.4 and 7.7.3, respectively, be updated as shown in Table 1. Additionally, REC requests that the HCl hourly emission rate for emission points B19 and B18 established in Conditions 7.6.5 and 7.7.4 be updated as shown in Table 1.

Response:

For the same reason given for comment 25, above, Ecology declines to relax this condition. On the basis of the new information describing previously undocumented turnaround emissions that REC has provided in their comment Number 26, Ecology will add a testing requirement to demonstrate compliance with the emission limits contained in the public version of the preliminary determination for these scrubbers during turnarounds.

REC Comment 27:

Proposed change: REC requests that the term "inlet" be removed from the first sentence of Condition 7.6.7.2.

Response:

Inlet testing of some REC control devices has been replaced with more comprehensive outlet testing.

REC Comment 28:

Proposed change: REC requests that the Approval Condition listed in Condition 9.2.2.3 be changed from 'Approval Condition 17' to 'Approval Condition 18.2.1'.

Response:

Ecology has corrected several MS Word outline numbering errors contained in the preliminary determination.

REC Comment 29:

Proposed change: REC requests that Condition 7.7.7 be removed from the permit.

Response:

Ecology has corrected several MS Word outline numbering errors contained in the preliminary determination.

REC Comment 30:

Proposed change: REC requests that the grain-loading limit for emission point C20 established by Condition 8.2.1 be updated as shown in Table 1. Additionally, REC requests that the PM_{10} hourly emission limit established by Condition 8.2.1 and the silane hourly emission limit established by Condition 8.2.2 be updated as shown in Table 1Table 1.

Response:

As in the response to Comment 26 and others, Ecology declines to relax this condition.

REC Comment 31:

Proposed change: REC requests that the grain-loading limit for emission point B14 established by Conditions 9.2.5.1 be updated as shown in Table 1.

Response:

For the same reason as provided to Comment 12, Ecology declines to relax this condition.

REC Comment 32:

Proposed change: REC requests that the records mentioned in Condition 9.2.5.5 be maintained on-site for a period of three (3) years. Condition 9.2.5.5 does not currently detail a specific retention time period.

Response:

Ecology will specify a retention period of 5 years as indicated in the response to Comment 7.

REC Comment 33:

Proposed change: REC requests that the grain-loading limit for emission point B20 established by Conditions 9.2.6.1 be updated as shown in Table 1.Additionally, REC requests that the hourly emission limit for emission point B20 established by Condition 9.2.6.2 be updated as shown in Table 1.

Response:

Ecology declines to relax this condition for the same reasons provided to Comment 25 and 26 and others.

REC Comment 34:

Proposed change: REC requests that the extra period "." be removed from Condition 9.2.6.4.1 within the reference to Condition 18.2.3.

Response:

Ecology made the correction.

REC Comment 35:

Proposed change: REC requests that the silane feed rate identified in Condition 9.2.7.1 either be updated to 90.0 kg/hr or removed from the Approval Order.

Response:

Ecology agrees to this change.

REC Comment 36:

Proposed change: REC requests that the grain-loading limit for emission points B10 and C10 established by Condition 11.1.1 be updated as shown in Table 1. Additionally, REC requests that the PM_{10} hourly emission limit for emission points B10 and C10 established by Condition 11.1.2 be updated as shown in Table 1.

Response:

For the same reasons as provided to Comments 25 and 26, Ecology declines to relax the referenced condition.

REC Comment 37:

Proposed change: REC requests that the HCl exhaust concentration limit for emission points B10 and C10 established by Condition 11.1.3 be updated as shown in Table 1. Additionally, REC requests that the HCl hourly emission limit for emission points B10 and C10 established by Condition 11.1.4 be updated as shown in Table 1.

Response:

For the same reasons as provided to Comments 25 and 26, Ecology declines to relax the referenced condition.

REC Comment 38:

Proposed change: REC requests that Condition 15.2.3 be removed from the Approval Order.

Response:

Ecology has corrected several MS Word outline numbering errors contained in the preliminary determination.

REC Comment 39:

Proposed change: REC requests that Conditions 12.1, 12.2 and 12.3 be removed from the permit.

Response:

Ecology agrees that duplicative conditions are unnecessary and will remove them where they first appear in the Order.

REC Comment 40:

Proposed change: REC requests that further clarification be provided to condition 17.3.5 regarding equipment cleaning activities. The requested clarification pertains to the second sentence which reads "… of solvent associated with equipment cleaning activities outside…". The proposed change would state "… of solvent associated with paint booth spray equipment cleaning activities outside…".

Response:

Ecology will add the words "paint booth" to clarify the requirement for REC.

REC Comment 41:

Proposed change: REC requests that APPROVAL CONDITION 22 mentioned in Condition 18.9 be changed to APPROVAL CONDITION 23.

Response:

Ecology has corrected several MS Word outline numbering errors contained in the preliminary determination.

REC Comments 42, 43 and 44:

Proposed change: REC requests that the conditions listed in Condition 22.1.2.2 be changed from " 4..2.1, 5.14.1, 9.2.4, and 11.2.6 " to " 4.3.1, 5.14.1, 7.3.6, 9.2.4, and 11.2.6".

Proposed change: REC requests that the conditions listed in Condition 22.1.2.4 be changed from " 12.6, 13.6, 14.2, 17.1.5, 17.2.5, and 19.1.6 " to " 3.3, 3.4, 3.5, 3.6, 12.5.1, 13.5.3, 14.2, 15.2.4, 17.1.5, 17.2.5, and 19.1.6 ".

Proposed change: REC requests that APPROVAL CONDITION 22.1.2 mentioned in Condition 23.2 be changed to APPROVAL CONDITION 22.1.3.

Response:

Ecology has corrected several MS Word outline numbering errors contained in the preliminary determination.

Response to Submitted Written Comments

Neil McDowall Comments

Comment 1:
I would first like to thank the DOE in Spokane again for the public meeting you required for the Clean Air Permitting of REC's expansion. I was born and raised in the Moses Lake area where both my grandfather and father had dairies. One year due to a chemical application to the feed my father had purchased, toxic chemicals caused most of his herd to become very sick, over a period of time, and abort their unborn calves. After this very sad and tremendous economic loss I watched my father slowly loose most of his herd and eventually the dairy he so loved. Needless to say this early education of toxins in the environment have me very much concerned about my own small herd of beef cattle I raise adjacent to REC. I am currently the project manager building a 10 million dollar dairy south of I-90 between Moses Lake and George. We have been jumping through the hoops and obtaining all necessary permits. Between water permits, building permits and yes even clean air permits it has taken us up to two years to get permitted. The current worry in the dairy industry is the implied future threat of taxation for the DOE and EPA for the cows farting methane gas. I personally would much rather sit in a herd of farting cows (any day) than a release from a large chemical plant.

Response:
You're welcome to this opportunity to communicate with the Air Quality Program (AQP) regarding the AQP preliminary determination for REC's facility. The AQP understands the above comment is general, requesting no change to the preliminary determination.

Comment 2:
I am totally in awe that a large chemical plant can not only commence construction (Plant 4) before a clean air permit is issued but how the local government (City of Moses Lake) in revisions made to the SEPA didn't require a full Environmental Impact Statement. I feel it is the responsibility for the local government to protect the people and the environment and become somewhat educated in plant processes. Numerous neighbors at numerous city council meetings brought to the attention to the city the zoning issues, numerous toxic chemicals, the promised restrictive buffer zone and that the environmental checklist that REC filed however failed to mention the residents in the immediate area. I feel REC has been very misleading to what type of plant this was actually going to be with no regard to the neighbors in the area. I personally am requesting a list of the names and titles of the people that allowed Plant 4 to begin construction without their clean air permit in place. I would also like a copy of the Risk Management Plan for REC which would show possible blast zones if REC would be kind enough to provide this to their neighbors. An earlier explosion last fall rocked my house with the force of an earthquake. REC said it was a small baghouse explosion from dust and it didn't affect anyone. I now am

extremely fearful what a larger explosion would be like. I would also encourage that a worst case scenario and blast zone be made public knowledge to our community.

Response:
Ecology has little or no standing to appeal the lead agency's decision on SEPA after the public comment period has closed. If the lead agency ignored the stated concerns of the community, there may be recourse with them directly. As stated in the hearing, Ecology AQP has no jurisdiction over the Risk Management Plan. EPA Region 10 is the agency that administers that program for REC. The people that decided to risk the consequences of building Plants 3 and 4 prior to Ecology approval would include Tor Hartman, Senior Vice President and Russ Hamilton, Plant Manager. The Ecology AQP is in process of issuing a notice of violation to REC for initiating Plant 4 construction without approval.

Comment 3:
My mother passed away on February 2, 2009 of idiopathic pulmonary fibrosis (never smoked or drank). I feel that the REC plant emissions killed my mother. She stayed at the farm during the summer months after she retired and moved to Arizona. Purging of their stacks and the unintentional releases with prevailing winds go directly to my yard. I will never be able to forgive myself for allowing my mother to be in this danger zone. My daughters are not allowed to stay at the farm due to the risks of many of these chemicals stored at REC having the ability to cause birth defects in future generations. Megan refuses to stay at the farm with me and instead makes the trip twice a day to help feed the cows and have dinner made for me. Would REC please comment why they did not record a restrictive covenant as required by the Grant County Planning Department. Would the city of Moses Lake like to comment why they allowed this plant to build so close to residential properties with known inherant dangers to people within the community. The health of my cattle is at risk as I believe every resident that lives downwind to this chemical giant. I implore the Department of Ecology to deny this air permit until this plant can live safely in harmony with its neighbors. If plant 3 hasn't been able to start up safely to date why would another permit for plant 4 be issued?

Response:
Ecology AQP is obligated to issue an approval order if the facility can operate in compliance with air quality law and regulation. The preliminary determination includes emission limitations designed to ensure that is the case for REC. This comment also seems general in that the preliminary determination is not the subject. Zoning issues are not within the AQP jurisdiction and the AQP would be subject to suit by REC if we withheld the Order on that basis.

<u>Megan Fielding Comments</u>

Comment 1:
Why has this chemical facility never been subject to an environmental audit or review?

Response:
The Ecology Air Quality Program (AQP) periodically inspects facilities for compliance with the terms of their air quality permit(s). The frequency of these inspections is determined by the annual emissions from the facility. After the Plant 4 Order is issued, there will be Ecology AQP staff on-site for stack sampling event witnessing, compliance evaluations, and at least every five years there will be a full compliance evaluation ('audit') to determine the compliance status of the facility with its air quality responsibilities.

Comment 2:
I strongly believe that REC should have to submit and pass a full Environmental Impact Statement. If the city government isn't taking care of the people in the community with knowledge presented to the Department of Ecology why is the state not stepping up to the plate?

Response:
The SEPA process responsibility ultimately falls to the 'lead agency' as defined in statute. After the 14 day comment period on the SEPA threshold determination, Ecology has little legal recourse to alter that decision. However, in the Plant 4 preliminary determination, the Ecology AQP included terms and conditions that establish BACT and t-BACT (pollution control requirements) significantly more restrictive than proposed by REC. The impacts on air quality of REC's proposals were determined to result in acceptable impacts under WAC 173-400 and -460, suggesting that public health will be better protected by the AQP requirements.

Comment 3:
If Plant 4 construction has been started, why has a stop work order not been processed?

Response:
Ecology's AQP has required BACT and t-BACT in the Plant 4 Order that will require REC to retrofit some equipment and to meet emission levels significantly lower than they proposed. This is the risk a facility assumes when they choose to construct prior to acquiring our approval order. As Karen Wood indicated at the hearing, REC's construction without approval will be documented with a notice of violation. A stop work order would be the last step in Ecology's sequence of enforcement actions and would likely only be used if a facility refused to implement BACT/t-BACT or if it continued to construct a source that could be proven to otherwise violate State law or regulation.

Comment 4:

Plant safety concerns

Response:
The AQP has inserted incident notification requirements into the REC Order that start to address these concerns. Plant safety, however, is not within the AQP jurisdiction. As indicated during the hearing, EPA Region 10 administers the 40 CFR 68 Risk Management Planning program. County Emergency Services operates the incident notification process. Labor and Industries is responsible for the on-site emergency and worker safety issues.

Comment 5:
Animal health issues

Response:
The health issues your cattle and chickens have experienced are frightening. However, the AQP has no confirmation that these are a direct result of air emissions from the REC facility. It seems likely that these issues would require resolution in the court system.

Greg McElroy Comments

Comment 1:
In your response to comments and community concerns, please address the current regulatory and enforcement status of the facility and whether or not DOE intends to perform an environmental audit and/or require SEPA review of those aspects of the facility that are affected by the Plant 4 NOC but that have not been reviewed under SEPA.

Response:
The current regulatory status of the facility is that of a "synthetic minor" source: REC has opted to take voluntary emission limits for NOx, HCl, Methanol, and PM to avoid emission rates that would require a Federal Air Operating Permit. Synthetic Minor sources are monitored (audited) under the terms of the State Compliance Assurance Agreement which includes a full compliance evaluation (as defined in the agreement) every five years. REC's preliminary determination includes significantly expanded stack sampling and enhanced parametric monitoring to ensure that they meet the conditions of approval. Ecology's authority to revisit the lead agency's SEPA threshold determination is limited. Ecology has instead mitigated air quality impacts to the extent of our authority in the approval order.
Regarding the facilities enforcement status, Ecology does not disclose enforcement actions prior to issuance. As stated at the Public Hearing, Ecology recently found out that Plant 4 was under construction prior to approval and that violation will be documented.

Comment 2:

In your response to comments and community concerns, and given REC's weak compliance record and non-disclosure of relevant information, please address whether the air quality program has investigated the compatibility and consistency of the information supplied by REC with other public documents and regulatory requirements under EPCRA, the Risk Management Plan under 40 CFR Part 68, or the worker safety documentation from the Washington Department of Labor and Industries.

Response:
EPCRA, 40 CFR 68, and L&I Worker Safety programs are not within the jurisdiction of the Air Quality Program. The preliminary determination includes a condition that REC comply with 40 CFR 68. Because 40 CFR 68 outlines a Federal program not delegated to the State of Washington, use of and compliance with the condition must be determined by Region 10 EPA.

Comment 3:
The Preliminary Determination order should be revised and re-issued for public comment. According to the March 6, 2009 "Technical Support Document," in Section 4.0 "The NOC Application" REC has failed or refused to provide essential data requested by DOE to determine BACT for control devices in historical operations in Plant 1. Missing data forced DOE to set presumptive BACT levels, apparently without data, modeling, or other means to demonstrate compliance. Because this is a historical facility, the refusal of REC to supply this information lacks practical or technical justification. Proceeding to public comment and hearing without this information violates WAC 173-400-171(3), which allows public comment (and a hearing if requested) *after* all the required information and preliminary determinations are made.

Response:
Presumptive BACT/t-BACT determinations have been made for REC air pollution control equipment plant-wide ("Plants 1, 3, and 4") for emission points where Ecology believes the control equipment should and can perform better than REC proposed. Each presumptive BACT determination reduces emission rates from those proposed by REC in its application materials. Modeling of facility emissions was performed for the emission rates proposed by REC. Lower emission rates reflected in the presumptive BACT levels will provide an additional margin of public safety. Public review of these determinations has been provided.

Comment 4:
REC's failure to provide the information discussed in Comment 3 above is compounded because the material alteration of Plant 1 appears to have occurred in conjunction with the pre-mature and unpermitted construction of Plant 3 or Plant 4. Any additional operation of Plant 1 without

proper information, BACT, and t-BACT is unjustified for practical and technical reasons since this a self-inflicted hardship arising from REC knowing refusal to follow applicable law.

Response:
As stated in the previous response, presumptive BACT has been established for those control devices in Plant 1 where an emission increase could be expected. Presumptive BACT does represent a hardship for REC, but will upgrade the control devices plant-wide to a 'state of the art' condition.

Comment 5:
In regard to Equipment B23, B24, and B25 hot oil heaters, what is the justification or necessity for a one year delay in requiring the retrofit to ULNB to achieve 9 ppm NOx, 30 ppmv CO especially if the current equipment perpetuates a prior non-compliance with BACT when REC designed, modified, or constructed in non-compliance with New Source Review?

Response:
During the permitting of the Plant 4 hot oil heaters, Ecology determined that the Plant 3 BACT determination was flawed: manufacturer-supplied emission levels for the combustion of hydrogen (the reason for the less restrictive BACT determination) appear to be based on erroneous calculations, and REC has not contracted for nor plumbed a supply of hydrogen to fuel the heaters. The Plant 3 hot oil heaters were installed prior to Ecology's recognition of these issues and it was determined that one year was a reasonable period of time for retrofit.

Comment 6:
In regard to A14 Siemens Silane Dump Vent, what is the design basis for allowance of 480 hours per year and how will use be reported, how will compliance be documented, and how will release be measured? What are the impacts at the nearest fence line, which is believed to be the Air Energy Industrial Park property?

Response:
Use of the A-14 vent was not limited by previous Approval Orders. Plant 3 and Plant 4 expansions were used as opportunity to limit this use to the maximum of 480 hours per year. It is anticipated that use of this vent may be significantly less than that as the Siemens silane production equipment is now connected to the Plant 3 and 4 systems, providing a reservoir for excess previously unavailable. The modeled impacts of 480 hours of use of this stack combined with the silane releases of the rest of the facility were determined to be acceptable at any fenceline in accordance with WAC 173-460. REC is required to monitor the nature and extent of flow through the stack.

Comment 7:
In regard to A12 a, b, c, and d cooling towers is PM10 the only pollutant or is there an aerosol or toxic component? How is compliance with the work practice determined and reported? How are emissions measured?

Response:
PM10 from cooling towers is a result of mist carryout and the impurities in the water supply. Some of the impurities are toxics listed in WAC 173-460. Emissions are calculated, considering the design of each tower, the quality of the water supply, and the degree to which water is concentrated prior to being blown down. The 2500 ppmw limit is contained in REC's NPDES permit with a requirement that it be measured three times per week. The limit has also been added as an approval condition in response to both REC's comments and this one.

Comment 8:
In regard to generators and pumps A37 through A41 how is the 260 hour threshold measured, recorded, and reported?

Response:
A non-resettable hours meter is required on all emergency and stand-by engines at this facility. The hours of use of each device will be a part of the annual report of emissions from the facility.

Comment 9:
In regard to all unplanned chemical releases at the facility, the NOC order should require that REC provide notice to DOE and the affected community. The permit language should expressly reject REC's prior practice of only reporting leaks and chemical releases that are not contained on REC's boundary. First, that is not the legal standard. Second, given the properties of many of the chemicals and releases, REC and adjacent property owners have no way to measure precisely whether airborne chemical releases extend beyond property boundaries.

Response:
Ecology agrees with this comment. The reporting condition in the preliminary determination is rewritten with the intent that Ecology be notified of all unscheduled releases within 2 hours of an incident. It is the responsibility of REC and Grant County Emergency Response to notify the affected community. Emergency notification is not within the purview of Ecology's air quality approval order.

Comment 10:

Prior to issuance of any new NOC order, REC must be required to certify its current compliance with 40 CFR Part 68 and to disclose all offsite impact zones on a map that can be made available to the affected property owners and the public. Because of the major modification of existing facilities and the piecemeal and delayed permitting process, the affected community and the public, including adjacent property owners have no confidence that REC is currently in compliance with 40 CFR Part 68 for all facilities and in the configuration with which it currently operates. Preliminary Determination 2.5 should be redrafted to read "The facility shall certify under oath by the responsible corporate officer, and subject to penalty of perjury, that the facility is in full and continuing compliance with all applicable requirements of 40 CFR 68. In the event of any non-compliance, the Washington State Department of Ecology and all adjacent property owners shall be immediately notified."

Response:
Ecology is not delegated administration of 40 CFR 68. It is unclear how the condition in the preliminary determination, requiring compliance with a Federal program in a State permit, will be implemented. It may just serve as a reminder to REC and be used by EPA Region 10 as an enforcement option if REC fails to comply.

Comment 11:
The notice provisions Paragraph 2.1 of the Preliminary Determination is essential but the reporting requirements should apply to "all" unplanned emissions and/or equipment or process malfunctions (whether emissions are "confirmed" or not). This would be in addition those emissions arising from "process or control devise upset or malfunction." REC has a documented history on not confirming upsets and underestimating the cause, duration, and size of upset events. The current language provides loopholes that invite REC to violate the spirit of the requirement by a parsing of words.

Response:
As indicated in the response to comment 9 above, Ecology has rewritten the reporting condition in the preliminary determination to address this concern shared by the public and Ecology.

Comment 12:
When does the prohibition on the use of hydrogen produced by SMR systems take affect? What is the purpose of this limitation? What is the planned use or disposal of the hydrogen produced and what is the assurance that it will not be sold for fuel use at adjacent locations?

Response:
The limitation on use of hydrogen is specifically that it not be used as fuel in a combustion device at the facility. It is effective upon issuance of the Approval Order. REC's end

products all require ultrapure silane which is produced in a sequence of reactors. The first of the reaction steps is done in a heated pressurized column in which hydrogen (H_2) reacts with gasified impure silicon (metallurgical grade Si) to form silane: SiH_4. Silane will be sold as-is (gas plant), or as Silicon granules (fluid bed reactors), or as rods (Siemens reactors). From the reactors, hydrogen is recovered and recycled to the hydrogenation columns or released.

Comment 13:
What is the justification for allowing the use of presumptive BACT and t-BACT levels at the facility when the normal permit process is to design, model or demonstrate compliance, and then commence construction? Is this method simply an accommodation to REC rather than requiring compliance with the regulations?

Response:
Ecology does not believe that presumptive BACT and t-BACT levels required by this Order are an accommodation to REC. The levels required in this Order are more restrictive than those proposed in REC's application. The application included modeling of the higher values as REC proposed in its application. Modeling indicated satisfaction of WAC 173-460 and the ambient air quality standards at the rates higher than allowed by this Order.

Lisa Steele Comments

Comment 1:
I have lived in the Moses Lake area all my life. It is my understanding that the original company was Union Carbide and now is REC. Both companies have had serious explosion and/or toxic releases with lethal results. The releases are continuing both in the air and possibly in the ground water. The releases have killed 2 people, forced neighbors to barricade themselves in their homes with instructions, pitted their windows, peeled paint off homes and cars, and have killed birds, and wounded animals. If these issues are not brought into the public eye so that the people of Moses Lake and/or the surrounding area can protect their health, diseases will increase (lung, cancer, asthma, etc) at an alarming rate. REC has just begun there first few years of construction. When the plants are up and running the people of Moses Lake will need to be protected. Please think about us when setting safety standards for REC.

Response:
The AQP appreciates the concerns expressed here. The preliminary determination, however, does not address process safety nor accidental releases (other than notification and quantification). No change has been requested in the AQP Regulatory Order so none is incorporated.

Lisa Bellomy Comments

Comment 1:
My name is Lisa Bellomy and I live in Moses Lake. My farm is located on the west side bordering REC property. There is an irrigation circle that REC leases out to a local farmer on this property. This irrigation circle is the only small buffer zone I have that sits between REC and my farm.
My Father-in-law, William L. Bellomy Sr., established this farm when the Irrigation Project was first brought to the Columbia Basin. After his retirement, it was passed on to his Son, my husband William L. Bellomy Jr., now deceased, where he and I farmed for 32 years. We have 1 Son, William L. Bellomy III. I have continued to lease out the farm and have tried to make this my final home so that one day my Son could inherit this 3rd generation farm. I also own a Hair Salon next door to my home where I have worked for 15 years.
Passed experience with ITI, International Titanium, a chemical industry that has since closed, shows that Heavy Industry, Agriculture, and Residence do not mix. This factory was located south of our farm and for several years continually had chemical emissions on our farm and on surrounding neighbors land that destroyed crops, corroded metal surfaces, and threatened our health and livestock. Several lawsuits were filed against ITI and with well documented evidence proved that the chemical emissions did cause damage. So I am very well aware of what it is like to live by a chemical factory.
I understand that REC prides themselves on safety and their on-going efforts to communicate with their neighbors with beepers and sirens and complying with DOE regulations. But I also understand that this facility is the first of its kind in the world and there will always be malfunctions and HUMAN ERROR!
When announced many years ago that the Wheeler Rd. Corridor would be zoned Industry, it was believed that it would consists of Agriculture Processing Plants that would help the Producers. We are now allowing harmful Heavy Industries to occupy this area, and it is making it impossible for farmers and country residence to work and enjoy their way of life.
I do agree that growth in Moses Lake will help bring more jobs and revenue to our Community. But when we allow Industries that are harmful to our environment, farmland, land values, residence, and our health, we are wrong in thinking that this is progress.
After my Son's Dad passed away, I made a promise to him that I would do everything I possibly could to protect and keep the farm. The growth of REC has made a serious threat to my farmland and well being. I look at the 60 years of development, the land, the trees, and the hard earned investments, and feel sadden that this is not important to preserve. All my future home-improvement plans and my peaceful life in the country has come to a standstill because of REC.

Response:

Ecology believes that this commentary reflects dissatisfaction with land-use planning issues of REC where it is located. The AQP jurisdiction does not extend to these nor can the Approval Order address them.

Larry Campbell Comments

Comment 1:
In regards to REC… (wants to be compensated for reduced property value, wants a buffer zone, wants the AQP to hold up the Approval Order until REC addresses damage to neighbors, concerned about safety). See attached.

Response:
As indicated in response to other comments, safety on-site or off during unanticipated releases is not within the jurisdiction of the Air Quality Program. The buffer zone is a land-use and possibly SEPA issue that cannot be addressed by holding or altering the AQP Approval Order.

Gail Adair Comments

Comment 1:
We are concerned about our community and if REC has even yet been approved by the appropriate clean air active bodies before continuing expansion. We have friends in the area of the REC plant and also own property in Wheeler, Moses Lake, and George. We would like an explanation as to why our government has turned the other way when dealing with this company's many unhealthy emissions and explosions while strenuous regulation is enforced on small private property owners.

Response:
Ecology Staff have issued permits and been evaluating emissions for the facility now owned by REC for several years and have spent the better part of the past three years evaluating and gaining an understanding of REC's expansion and how it relates to AQP-regulated emissions. Explosions are not AQP-regulated emissions and must be addressed by Labor and Industries, Emergency Response, or EPA's Risk Management Planning Program (40 CFR 68).

Comment 2:
With the typical wind that we get in Moses Lake and the type of releases I have seen that this plant has emitted into the air in the past, it is without question that chemicals from this plant become airborne and affect neighboring properties, people, their farm animals, birds and wildlife, etc. Underground water aquifers are a serious concern as not only does our air travel,

but our underground drinking water supply travels from the plant to other areas of Moses Lake. I am guessing that underground water aquifers freely change course similar to above ground streams. We as property owners are required to have extreme stream buffers for this reason for our above ground streams. So why does REC continue to be allowed to pollute our air and water? We are requesting that you place the health of our people and animals before the economic advantages that we may not even live to see.

Response:
The preliminary determination the AQP has prepared for REC contains conditions designed to ensure that REC complies with the air quality laws and regulations. This does not mean zero air emissions. There is no consideration of community or applicant economic advantage in the AQP permitting process.

Comment 3:
I do not believe that the Economic Development Council is an appropriate source of approval for this operation due to the obvious bias for economic development rather than for the health and safety of this community.

Response:
There is no involvement of the EDC in the AQP permitting process. Representatives of the EDC may speak at public hearings like any member of the community or representative of the facility. They speak as private citizens or on behalf of their agency, in that instance.

Comment 4:
A prime example of misplaced priorities just happened to us. Recently, my husband and I have been under attack by the fish and wildlife, as well as the county code enforcement and the planning department for repairing an existing dock on a residential lakefront. Three different government departments are now involved. How can we be scrutinized in this way for a dock repair when a plant such as REC gets a free pass spewing out chemicals that burn local people and animals' skin? I ask again, how on earth can the county and fish and wildlife justify the dispatch of several men and men with guns and spend several man hours coming to my property for two days taking pictures, writing reports, etc. because a little bit of natural dirt fell into the water during my dock repair when people and animals are dying because of the emissions of REC? Why aren't these departments taking pictures of the REC plant? I was ordered to stop work for 2-6 months to repair a dock on my private property. I cannot continue before ALL PERMITS ARE IN PLACE. How many times has REC been ordered to stop work for the chemical spillage and explosions that is regularly occurring out there?

Response:
REC has been given NO free pass by the AQP for issues within our jurisdiction.

Comment 5:
We in Moses Lake do not want our health to be sold out to a noted "cash cow". If the quality of our lives, and the air we breathe and the water we drink are less important than immediate gratification of a "cash cow", our lives will be forever affected and the long-term progress that this area desires will disappear for the short-term "cash cow." Let's be safe and assure our whole population that this plant will no longer emit anything into the air that we breathe or the water that we drink. The health of our environment and our citizens' should ALWAYS take priority. Do the right thing and shut them down until we have this assurance. The same way we were shut down for a little dirt spilling into the lake during our dock repair.

Response:
The AQP can impose and has imposed conditions on the operation of the REC facility designed to reduce its predictable air emissions to acceptable levels. This is not zero emissions. The AQP receives no payment from REC other than permit fees as set by law.

David Lambert Comments

Dear Mr. Koster, my name is David T. Lambert, I am a manager for Performix Nutrition Systems, 3146 Rd. N N.E. Moses Lake, WA 98837. We are a small feed company here in Moses Lake but as a part of Agri-Beef Co. employ over 800 employees in Washington. First and foremost our concerns regarding REC silicon has to do with what needs to be done to protect our employees from possible emissions created by REC. What warnings will be issued when problems (emissions occur) and what steps do we need to do to insure safety for our employees here at our Moses Lake facility. As a neighbor to REC, we have not been informed of any of the hearings. Last night at the meeting here in Moses Lake the D.O.E. advised they had put articles in the newspaper and other media outlets. I am a bit disappointed that they had the Grant County Economic Council Rep. at the meeting, they represent the area businesses and we were not mailed any notices regarding the meetings pertaining to REC. Hopefully this is addressed in the future. I appreciate the fact that DOE held a public meeting but in the future you might try to include mailing options to get businesses and people living in the area notified. This is my written comment regarding REC Draft Air Quality Permit, Thanks David Lambert

Response:
Ecology's Air Quality Program (AQP) went well beyond our statutory obligation to provide notification of this permit action, public notice period, and hearing. The public notice of hearing and preliminary determination was published twice in the Columbia Basin Herald, once on March 13 and once on March 27, 2009. In addition the notice was e-mailed to neighbors who had indicated concern, on about March 13, 2009. Prior to the hearing, a display ad was arranged in the Columbia Basin Herald to announce the hearing. The preliminary determination, AQP file documents and the associated technical support

documents were made available to the public at the Moses Lake City Hall from March 11, 2009 through April 22, 2009. Ecology would appreciate any constructive suggestions you might have regarding improving this notification procedure. Attendance and commentary at the hearing was as citizens of the community. Ecology neither specifically invited any citizen (Grant County ECD representative) nor could we modify their testimony. Prior to the hearing, though, Ecology attempted to make clear that process safety was not in the jurisdiction of the AQP permit action. Concerns should be addressed to EPA for risk management plans, Labor and Industries for process safety management, or Grant County Emergency Services for emergency notification.

Agri Beef Comments

Comment 1:
Complete a comprehensive study and review of neighborhood compatibility under the State Environmental Policy Act (SEPA) and require incorporation of Best Available Control Technology (BACT) to reduce emissions and toxic control technology (t-BACT). This study and its recommendations should be openly disclosed and subject to public comment.

Response:
The SEPA process is the ultimate responsibility of the lead agency (in this case, the City of Moses Lake). After any required comment period, Ecology's standing to reopen SEPA is very limited. However, the Air Quality Program (AQP) addresses BACT and t-BACT in its approval orders. The Plant 4 preliminary determination of approval includes specific BACT and t-BACT determinations. The reasoning is contained in the associated technical support document. Both documents and the applications for Plant 3 and Plant 4 and Ecology's file documents were made available to the public starting March 11, 2009 at Moses Lake City Hall. Notice was published of this availability in the Columbia Basin Herald (CBH) on March 13, 2009. All neighbors the Ecology AQP was aware were concerned were additionally notified in e-mails. A display ad was published in the CBH again notifying the community of the public hearing held April 16, 2009 to accept testimony on the preliminary determination. Testimony was accepted until the close of business April 22, 2009. Ecology believes this provided complete disclosure of the AQP preliminary determination. It is also appreciably more opportunity for public review and comment than is required in our statutes or normal in our AQP permitting procedures.

Comment 2:
DOE review of air permit issues must be coordinated with EPA risk management planning and community-right-to know issues that involve emissions, explosions, and safety for people who live and work in the area. DOE is in a position to show leadership on these important issues.

Response:
The coordination and leadership role for Ecology suggested in this comment appears to require changes to State law: Ecology's AQP has not been delegated authority from EPA for the 40 CFR 68 risk management planning program. EPA's 40 CFR 68 designee was invited to attend the April 16, 2009 hearing, but declined.

Comment 3:
The Notice of Construction order should be placed on hold until the required information is accurate and complete and subjected to independent review. Public comment at this stage is premature on those parts of the application that are incomplete.

Response:
Those parts of the application Ecology's engineer found to be incomplete were addressed by establishing appreciably more restrictive limits than REC had proposed for its emissions. The public was invited to provide testimony on the engineer's decisions contained in the preliminary determination and technical support document. Ecology does not believe that more explanation from REC (requesting relaxation of the limits in the preliminary determination) will result in more meaningful review by the public.

Comment 4:
Prioritize stakeholder interests (e.g. neighboring facilities, public health, safety and community well-being) above economic and political interests. There should NOT be a double standard on the review of REC. Allowing REC to continue expansions efforts prior to pre-construction approval and permits shows political favoritism and expediency at the expense of safety and the environment.

Response:
The AQP has utilized <u>NO</u> double standard on the review of REC. The two expansions have taken three years to process as a result. The AQP engineer's decisions have been presented to the public for their review and comment at all stages of the three year process. Decisions have been made to impose limits that err on the side of public safety for those issues within AQP jurisdiction. This has been done at the expense of the timeliness demanded of permit processors in the Ecology AQP. The AQP has also gone well beyond the statutory requirements to make our decision available to the affected public.

Comment 5:
Given the recent instances outlined above, REC should do more to earn public trust and provide a better track record of safety and compliance issues. REC should be required to complete a crisis management (or contingency) plan that will inform, educate, and protect the health risk of all stakeholder interests, including neighboring facilities like ours. The elements of an effective crisis management plan should include the following:

> i). Require the establishment of safety guidelines and ensure that the guidelines are made public and enforced
> ii). Request the implementation of an appropriate notifications system. Because of the complexity of the facility and the lack of similar facilities in Washington, adequate measures of off-site release and the impact of those releases is crucial. Considerations for insuring an effective monitoring system should incorporate the following variables: differing atmospheric conditions, elevation, distances, wind, and risks to population groupings

iii). Identify the potential risks, mitigation strategies for those risks, and emergency management response in a worse case scenario. There needs to be an effective and realistic notification and evacuation plan.
iv). Request that REC be required to perform safety training for individuals and companies within a specified risk area radius from their facility. This training should include education about the various alarms, responses to those alarms, and evacuation plans. In addition, the training should explain in detail what, how, and who will notify neighbors in the event of a release to the atmosphere.

Response:
Ecology agrees that land-use planning, emergency response and public safety are a huge concern to REC's neighbors. The jurisdiction of the Ecology AQP approval order extends only to predictable releases, however. Land-use decisions, plant-site safety and emergency response are not issues within that jurisdiction.

Response to Hearing Testimony

Larry Campbell Comments:

Larry. Good evening. Larry Campbell. I have 2 addresses. Mr. Campbell you're supposed to address the hearing officer it's not for the audience. I will look at her too. Well please go back to the podium, please yeah. Um, she looks human to me. Alright, well when does my time start? Laugh… Okay you can start over, okay.
Alright. Okay go ahead. Um, you know I would like to address REC as I go here but um. My name is Larry Campbell its 4480 Road N NE and our residence at this time is 154A rodeo Trail Rd, Okanogan WA. We had that little farm half mile up north of road 4 for 19 years we expected to retire there. In 1998 when they had the explosion there the week following the explosion they had another explosion, I was out of town that day. But my wife got dumped on pretty good with some kind of gas that came over the house. And she had her, her skin was burning, she got deathly sick. It took the paint off the car and I didn't realize it and for two years I didn't do nothing about that.
Um, don't get me wrong. I think REC is needed in this area. I am all for growth if it is done, if it is positive growth. There's always need for people working. It's just too bad it had to be in my back yard. After the explosion in 1998 my wife didn't want to live there when they started talking about increasing the size of the plant by 4 times. Because, according to what they are proposed going in we can just think of what the 4 time proposed is going to be.
Um, it kind of upset our little world and she is pretty, pretty bad shape out of all this because she didn't really want to move away from that place. We've got a neat little place with a lot of trees around and a um, fountain, little deck to sit on at night. And I actually had asthma all the time I lived there.
Now that we moved to Okanogan, we moved a year ago we sold the place and that is kind of my complaint is I still want a house and 10 acres right there. But my complaint is I had a hard time selling the place and we've wanted out of there so bad just to get away from the factory that we almost give the place away.
So I donated my land for a buffer zone. They paid $43K an acre for some land across the road south of me. And I sold my land for a couple thousand an acre. And I don't see no fairness in that. But I had to do it to get out of there. The person that bought it don't live there he rents it out. I had a hard time finding anybody that really wanted to live there. And I got one more house to sell and it's, it's been a struggle.
Like I say I don't I like to see this place going and I am sure this is, is just procedure tonight and you're going to go ahead and give them the permit. And you've got to do these hearings or else you get in trouble with the public. But I want a, I want you to think about maybe having them have a little bigger buffer zone to take care of the few neighbors.
If they just take care of these few neighbors they would get a lot of monkeys off their back. You know there is earmark money now and every place. This factory could have some earmark

money. Take care of the neighbors. You know I tried to be a good neighbor to everybody all my life. And um, I have got another 5 minutes but I am going to quit.
Um, I can do something more in writing. I have been in the cattle business all my life and I, I actually run my cattle business out of that place right there. We've winter cattle in the corn field in the winter time and since then I have no place to run my cattle out of or ran raw the deal out of and I am out of the business. And 20 years ago I could have started over but now I am too old. Thank you.

Response:
The comments seem directed toward things outside the AQP jurisdiction (land-use planning, emergency releases). No change will be made to the preliminary determination as none is requested.

Terry Brewer Comments:

I am Terry Brewer. Uh, I work for Grant County economic development council as executive director. Our address is 6594 Patton Blvd. NE, Moses Lake. I signed in on the card and my home address is Soap Lake.
I have worked in Grant County for almost 12 years. Uh, my job at the council is primarily to work with existing industrial sector customers in Grant County as well as those companies that may be interested in relocating or building a new facility somewhere in the state of WA, trying to entice them to also to look at Grant County.
We have uh, I am not an engineer, I am not a chemist, I am not technically proficient. But I have worked with companies that were in Grant County when I came to work here that were growing and they were dealing with the Department of Ecology on new permits, be they water permits, waste water discharge permits, air quality permits.
And If I have learned one thing over those 12 years it's that the employees at the Department of Ecology most in the Eastern Washington regional office as well as in the state department head in Olympia, you are very proficient. You know your jobs and you do them well. You are here for the protection of our environment and the citizens and the State of WA and I have learned that you do your job well.
I have worked with a number of companies that have come into WA from somewhere else and they have done facilities in California, East Coast, and points in between. And they twist my ear off when they start dealing with the Department of Ecology. They say this is the toughest agency that we've ever dealt with. And I say, but you know what as worst as it is to live in Washington we care about our environment we care about our public, our community, and they're just doing their job. They take care of for us that are here now and for those that will be here in the future. So, I know you do your homework, and I think you do it right. We've seen plants permitted that didn't materialize here for one reason or another – economics, financing didn't occur sometimes. But, we've seen plants that you did permit that did expand here, did materialize here and I trust

that in every case, because they're still operating today, that they have performed according to your permit standards or you would have shut them down. So I trust that when you do – when your agency issues a permit, that it is done right and we'll be protected – we the citizens and the public of Grant County.
Because I work in the industrial sector, I choose to do this work in the industrial sector because I care about the community and I care about good jobs for people in this community. It's important in today's world to have a diversified economy. Most rural communities aren't as well diversified as Grant County is. We're fortunate to have the state of an economy today that we have, because we have a diversified industrial base, agricultural base, value added food processing, a significant number of things going on in Grant County, all of which require these permits that I've discussed – air quality, wastewater discharge, water permits. But they're all functioning as they should, as they were designed to do, and I trust that this plant, phase 4 will perform as well. Thank you for your time.

Response:
The preliminary determination (subject of the hearing) will not be modified as a result of these comments.
Megan Fielding Comments:

Hi, my name is Megan Fielding. I live – well, I used to live at 13953 Rd 4 NE. I choose not to stay there at night anymore. We have another place. I want to thank the Department of Ecology for coming up here and allowing the public to voice our concerns. We've been trying to voice them between the city council meetings and several of us along that road have tried to write in to the Columbia Basin Herald, into the editorial section, but for some reason the paper won't write anything that the neighbors have to say about REC, and I'm not sure the reason why. Like Mr. Brewer, I'm not a rocket scientist, I'm not a chemical engineer, but I'm a halfway educated person. I was there – I've been there for 30 years. Basically, when International Titanium had its problems, which we all knew about, they didn't bother my cattle. They didn't seem to bother anything. I ended up getting subpoenaed in by International Titanium to go against all my neighbors, and I think most of them got a settlement out of International Titanium. I'm not sure. But I wasn't going to say they harmed my lifestyle. REC is different. When they say they've never had a release that has left their property. And we did a community right-to-know with Grant County Emergency Services last year and they've never had a call in, never reported release – or they said we dropped everything, we sent it to the state emergency services and hazmat or whatever and we did a public right-to-know and they had never heard of anything. Well, they have had releases, they have left the property. Two summers ago, I believe it was, we had a little pasture across the road that borders to REC's property and we had our cutting horse, her name's Snort, (I think she won the novice up in the Okanagon cutting club on her) and we came home. And, it's usually during the summer and evidently, from what I've understood, they've purged their systems during the summer. They'll close down, and I'm not sure about

that. But, I am sure – I ended up having to have a veterinarian out. She had caustic burns all over her back, which I had no idea what they were. And, the veterinarian had to treat her with hydrocortisone to try to take down some of the inflammation. It was later that I heard from the neighbor up the road that they had been out gardening, or out in their back yard and had to go in because they felt the burning on their skin. Another neighbor, about 3 months later was mentioning that they had had the burning on their skin. And, then I find out 6 months later that somebody else's horses in the area also had the blistered backs. Like I say, I'm not a scientist that I can deduce that it probably was some sort of chemical. You know, nitric acid, hydrochloric acid in the air. And, I did at one time have 53 chickens and they all died. My chickens at my other place did not die, by the way.
I believe it's, is it Sharon, Farmerton? She stopped by and she said well, can I do anything from REC about your 53 chickens? And I said, "Well, don't give me 53 more chickens. I don't want to have to be burying 53 more carcasses." They have affected our quality of life. I can't keep anything in the pasture across the road, my cattle have had a lot of problem with ulcerated eyes. But, I want to thank you for hearing this tonight, because I think that it's really needed that this information gets out to our community. You know, it's like the Indian proverb, that we aren't inheriting this from our ancestors, the land we live on, basically we're borrowing it from our children. Thank you for letting me speak.

Response:
These comments are directed toward issues outside the AQP jurisdiction. The preliminary determination (subject of the hearing) will not be modified as a result of these comments. Issues of emergency notification are handled by Grant County Emergency Services, on-site accidental releases by Labor and Industries, and off-site by Risk Management Planning under EPA.

Neil McDowall Comments:

I'm Neil McDowell. I live on the corner of 4& N, and I chose to stay there just because we have animals there. At this time, I think I'm going to save my comments and I'll write them. But, thank you for your time.

Response:
None needed.

Greg McElroy Comments:

My name is Greg McElroy. I represent Vic and Vance Jansen, and the industrial park development that is adjacent and on the south fenceline of the property. This draft permit shows substantial work by the staff of the Department of Ecology in a situation where, by looking at the

timeline, they had to go through the permitting process backwards. The plant was designed and under construction before it was approved and it continues to operate even though there is not a notice of construction authorization on the plant. We are having a technical review of the permit. We are concerned that there are too many emission points, too many fenceline toxic issues and too many other potential areas where it's good to set a restrictive level but I'm not sure what the data states whether or not the level is possible to achieve. And, of course you don't know whether you achieve it or not until after it hasn't been achieved. But, we will submit written comments and our general comment is that we want REC to succeed in this community but the impacts are disproportionate on the people who live in the shadow of the facility. And, we're hoping that the benefits of this facility can be shared by everyone in the community. Thanks.

Response:
Ecology has responded to the written comments from Mr. McElroy.

Tim Bodine Comments:

Thank you. My name is Tim Bodine. I'm the president of Performix Nutrition Systems. Our physical address and business address is 3146 Road N NE in Moses Lake Washington. I'll take a quick second to say thank you to all the people who participated tonight. I appreciate all the effort that they've given and the comments that have been provided.
We operate a business that is the closest physical structure south of the REC facility. Our primary concern is about the safety of our workers. Certainly the other concerns of ours is for the other workers in the other businesses located around that facility as well as the residents in that general area. Our concerns on this permitting process are in regards to the alarms, the notification, the monitoring systems that are in place and what will be presented in way of an evacuation plan, release zones, blast zones and whether or not there will be any safety training or will adequate monitoring be provided above and beyond several employees with chest level monitors patrolling the perimeter of the property. If it's necessary at this time, I will provide you notice that I will be providing written comments and I would like to thank you for the opportunity to present tonight. Thank you.

Response:
Ecology responded to Tim Bodine's comments made in writing, also. The emergency response issue was carefully described as outside the AQP jurisdiction. The subject of the hearing was the AQP preliminary determination and its adequacy to address REC's emissions within AQP jurisdiction. The preliminary determination will not be changed in response to these comments.

Yusuke Nakajo Comments:

My name is Yusuke Nakajo. I'm working _____Corporation, located at 1953 Graham Road, Moses Lake, Washington.
I believe REC is a good company. And so REC will be successful _____in Moses Lake and in Grant County area. On the other hand, many people are concerned about the safety issue. Information is very limited.
I'd like to know more information, especially about the safety issue, also the gas issue.
_____I'm proud of REC but on the other hand I'm working and living in Moses Lake and so I really wish they'd _____ more quickly.
Thank you very much.

Response:
Ecology had some difficulty deciphering these comments, but safety is not within the AQP jurisdiction. The "gas issue" is addressed in the preliminary determination with significant reductions in routine emissions and significant enhancement of stack testing, monitoring, and reporting. No change is requested or made to the preliminary determination as a result of these comments.

Appendix #1: Text of REC Public Comments

April 22, 2009

Mr. Robert Koster
Permit Engineer, Regional Air Quality Section
Washington State Department of Ecology
Eastern Regional Office
4601 N. Monroe Street
Suite 100
Spokane, WA 99205-1295

Dear Mr. Koster:

The following letter provides comments on the Washington Department of Ecology's (Ecology's) Preliminary Determination of the Order of Approval for changes at REC Solar Grade Silicon's (REC's) Moses Lake facility, dated March 12, 2009. The comments are presented in a manner consistent with the organization of the Preliminary Determination.

Comments

1. **Proposed change:** REC requests that the control equipment description listed for emission points A12a, A12b, A12c, B26, and C26 (as characterized in the equipment summary table at the beginning of the Preliminary Determination) be modified to establish consistency with the corresponding approval conditions. The control equipment description for these emission points in the Preliminary Determination includes "work practice to maintain Total Dissolved Solids (TDS) below 2500 ppm"; however, a TDS limit is not established in the corresponding approval conditions. Accordingly, REC requests that the TDS language be removed from the equipment summary table.

Reason: REC is aware that the equipment summary table presented prior to the approval conditions of the Preliminary Determination is for informational purposes only and therefore does not represent enforceable permit conditions. However, REC wishes to ensure that this informational summary table is consistent with the approval conditions established later in the permit. Operating requirements for emission points A12a, A12b, A12c, and A12d are established by Condition 14. This approval condition and its subparts restrict the water treatment chemicals that may be used for the cooling towers. Operating requirements for emission points B26 and C26 are established by Condition 6.3. Permitted requirements for these emission points include a drift rate limit of 0.0020% of the water circulation rate and a water circulation rate limit of 2,000 gallons per minute for each cooling tower. The permitted drift rate for these systems will be achieved with the use of high efficiency mist eliminators. Although REC operates the cooling towers in such a way as to maintain TDS concentrations at

reasonable levels, the approval conditions for the cooling towers do not establish limits on the TDS concentration of the cooling water. As such, REC requests that the control equipment description listed in the informational table be updated for consistency with the approval conditions of the Preliminary Determination.

2. **Proposed change:** REC requests that the term "immediately" in the first sentence of Condition 2.1 is replaced with the phrase "as soon as reasonably practicable, but not later than by the end of the following business day."

   Reason: Condition 2.1 requires that REC notify Ecology Eastern Region of process or control device upsets or malfunctions that result in excess emissions "immediately." As the term "immediately" is not defined elsewhere in the Preliminary Determination, this requirement might be interpreted as meaning "without lapse of time or instantly." Because REC will need sufficient time to evaluate the upset or malfunction in order to determine whether an excess emission occurred prior to notifying Ecology of the event, it would be impossible to demonstrate compliance with a literal interpretation of the immediate notification requirement. Therefore, to ensure that REC's ability to comply with Condition 2.1, REC requests that notification be required "as soon as reasonably practicable, but not later than by the end of the following business day" rather than "immediately" after a process or control device upset or malfunction that results in excess emissions. Pre-established and regulated timelines are currently being followed, as otherwise directed, and further reporting and/or notifications may jeopardize current emergency reporting hierarchy.

3. **Proposed change:** Per Condition 2.2, excess emissions are defined as "any criteria or toxic air pollutant emissions that are released from any emission unit or from the failure of any plant component at a rate or concentration above the emission factors approved by Ecology for reporting under Condition 23 of this determination." Condition 23.1 states that "the list of approved [emission] factors will be provided by Ecology to REC prior to the first annual report and may be modified only upon written approval from Ecology."[2] REC requests that the definition of excess emissions in Condition 2.2 be updated as follows, to be consistent with the definition established in WAC 173-400-030(29): "…at a rate or concentration in excess of any applicable emission standard."

Reason: Condition 2.2 defines excess emissions as any emission rate or concentration that exceeds the emission factors approved by Ecology and provided to REC prior to the first annual report (January 20, 2010). REC will be unable to evaluate whether an emissions event is an excess emissions event during the time period between the issuance of the permit and the receipt of the approved emission factors from Ecology. To ensure that REC is capable of evaluating potential excess emission events as soon as the permit becomes effective and

[2] Per Condition 23, reports are due within 30 days following the end of the calendar year. Assuming that the final approval order for Plant 4 is issued to REC in 2009, the first annual report would be due by January 30, 2010.

operation begins, REC requests that excess emissions be defined in terms of an exceedance of permitted limits. For sources of routine permitted emissions (including emissions associated with anticipated maintenance and power outage operating scenarios), REC requests that excess emissions be defined as "any criteria or toxic air pollutant emissions that are released from any emission unit or from the failure of any plant component at a rate or concentration above the emission limits established in this approval order." For sources that do not emit air pollutants under normal operating scenarios (e.g., emergency vent scrubber stack), REC proposes that excess emissions be defined as any release of air emissions, other than emissions associated with readiness testing and maintenance of the emergency equipment, that is not characterized by the approval order.

4. **Proposed change:** Condition 2.3 states that "in the event of a control device upset or malfunction, the process equipment controlled by that device shall be shut-down as soon as safely possible..." REC requests that this language be modified as follows: "In the event of a control device upset or malfunction, ***best management practices shall be employed to minimize emissions from the process equipment controlled by that device.***"

   Reason: The proposed language provides flexibility in allowing REC to respond to control device upsets and malfunctions in the most appropriate manner. Responses to upsets and malfunctions should be handled on a case-by-case basis, allowing REC to determine whether shut-down of the unit or another action is the most effective method to minimize emissions.

5. **Proposed change:** REC requests that the last sentence of Condition 2.3 be removed. The specific language that REC requests Ecology to remove is as follows: "Excess emissions resulting from the shut-down of any equipment, or the venting of any substance from any equipment during an emergency upset procedure shall be documented as an excess emission as described above regardless of the emission rate or concentration of the release."

   Reason: Excess emissions are defined under Washington Administrative Code (WAC) 173-400-030(29) as "emissions of an air pollutant in excess of any applicable emission standard." Based on this definition, emissions must exceed a certain threshold in order to be classified as excess emissions. The definition of excess emissions found in the proposed language of Condition 2.2 of the Preliminary Determination for REC's Moses Lake facility is consistent with the definition of excess emissions established in the WAC. However, the language of Condition 2.3 expands the definition of excess emissions to include all emissions that occur as the result of shutting down equipment or venting during an emergency upset procedure, regardless of whether these emissions exceed a standard. It should be noted that the expanded scope of the term excess emissions based on the language of Condition 2.3 is not consistent with the WAC.

   REC requests that the language of Condition 2.3, which broadens the category of excess emissions to the point where it is inconsistent with the WAC definition, be removed. This modification to the language of Condition 2.3 will allow REC to evaluate emissions from equipment shut-down or emergency upset procedures on a case-by-case basis to determine whether each event meets the

regulatory definition of an excess emission (rather than to assume that all emissions resulting from equipment shut-down or emergency upset procedures are excess emissions). It should be noted that REC is required to record (under Condition 22.1.3) and report (under Condition 23.4) the nature and details (e.g., date, time, duration, cause) of any emergency or other situation. Therefore, REC will keep records and file annual reports with Ecology to describe these emergency operating scenarios and to provide information related to equipment shut-downs and venting during emergency upset procedures. REC asserts that the required recordkeeping and reporting for emergency situations under Condition 22.1.3 and 23.4 satisfies Ecology's intention for expanding the scope of the excess emissions classification under Condition 2.3. REC contends that emissions associated with upset conditions should be recorded and reported as excess emissions only in the event that the emissions meet the definition of excess emissions as defined in Condition 2.2 or WAC 173-400-030(29).

6. **Proposed change:** REC requests that language be added to Condition 2.4 to clarify that the conversion of silane to fine particulate matter (in the form of silicon dioxide) is a kinetic reaction and that the reaction is not instantaneous but rather may take several hours to complete. However, for the purposes of determining annual emissions from REC's Moses Lake facility for annual emission reports and evaluating ambient pollutant concentrations near the facility, REC will assume that all silane is in the form of $PM_{2.5}$.

   Reason: In preparation for the Notice of Construction (NOC) application for Plant 4, REC commissioned an objective scientific review to examine the conversion of silane to silicon dioxide.[3] The results of this study indicate that, at high silane concentrations (greater than 2-3 mole %), silane rapidly reacts with oxygen at atmospheric conditions to form silicon dioxide. At low concentrations, silane reacts with water vapor in the air to form silicon dioxide at a much slower rate. Due to the compositional variability in the exhaust streams of silane emission sources, it is difficult to accurately characterize the silane concentration of the stream and thereby determine the conversion rate of silane to silicon dioxide. The silane concentration of most atmospheric releases is expected to be low (e.g., slower reaction mechanism), as REC uses sophisticated control equipment to minimize atmospheric silane releases. Consequently, the majority of silane emissions will be in the form of silane, rather than $PM_{2.5}$, at the stack. However, for conservatism, silane emissions for annual emission reports are quantified by assuming that all emitted silane remains unreacted, while PM_{10} emissions for annual emission reports are quantified by assuming that all emitted silane converts to particulate silicon dioxide.

7. **Proposed change:** REC requests that delivery receipts for diesel content certifications be maintained on-site for a period of three (3) years. Condition 3.6 does not currently detail a specific retention time period.

   Reason: Numerous records, receipts, and files are stored and maintained at the REC facility. The predetermined time period is requested to purge unnecessary files, as well as, provide specific guidelines for record retention.

[3] William Brenamen, lead silane scientist serving as a consultant to REC, was commissioned to investigate the conversion rate of silane to silicon dioxide.

8. **Proposed change:** REC requests that the grain-loading limit established by Condition 4.1.1 for emission points A1a, A1b, A1d, A13, and A32 be updated from 0.005 gr/dscf to 0.01 gr/dscf. By updating the grain-loading limit established by Condition 4.1.1, the annual emission limits established by Conditions 4.1.2, 4.1.3, 4.1.4, 4.1.5, and 4.1.6 for the same units will also be updated, as shown in Table 1.

Reason: Grain-loading limits and emission limits for the emission points listed above were established in Approval Order 07AQ-E223, Amendment #1 dated November 20, 2008.REC is aware that Ecology – Eastern Region and Ecology's Lacey office have differing interpretations of the applicability of Best Available Control Technology (BACT) requirements for existing equipment. The differing interpretations are detailed further in the following reason for the proposed change. However, based on either interpretation of BACT applicability, the emission points listed above are not subject to a BACT review. As a result, the limits associated with these units should not be updated as part of the Preliminary Determination for Plant 4.

BACT requirements apply to individual emissions units that are modified. The New Source Review (NSR) program established under Washington Administrative Code (WAC) 173-400-110 adopts the definition of the term 'modification' consistent with Title 40 of the Code of Federal Regulations (CFR) Part 60 New Source Performance Standards (NSPS) Subpart A.[4] Under this definition, the term 'modification' only applies to a physical or operational change to an emission source that results in an increase in the maximum hourly emission rate of the emission unit.

The first step in evaluating BACT applicability is to determine if there is a physical change or change in the method of operation to an existing emissions unit. Note that a "change in the method of operation" does not include an increase in the hours of operation in this case.[5] If an existing emission unit does not undergo a physical change or change in the method of operation, then it does not trigger BACT. The existing A-series fabric filters are permitted under REC's existing permit, Approval Order 07AQ-E223.

The Siemens-side filters will not experience a physical change or a change in the method of operation as a result of the proposed expansion project, and therefore are not subject to BACT requirements. Post-project, silane generated by the Siemens-side silane unit may be routed to either the Siemens reactors, Fluidized Bed Reactor (FBR) system, or the silane loading system. However, the Metallurgical Grade Silicon (MGS) directed to the filters will not change in nature, and the quantity of throughput will not change as a result of the project. The A-series filters are currently capable of reaching their maximum capacity. As such, the proposed project does not increase the potential throughput to the filters.

[4] 40 CFR 60.14(a)

[5] Mr. Al Newman, Ecology, clarified the definition of "operational modification" during REC's previous permit effort, in a November 21, 2006 phone call with Ms. Maren Seibold, Trinity.

The second criterion in the process of evaluating whether existing equipment is subject to BACT is to determine if the change results in an emissions increase. Ecology's Lacey office confirmed that Ecology uses the NSPS applicability test to determine BACT applicability at an individual emission unit, and that this test is based on the maximum hourly emission rate before and after the change. The maximum hourly emission rate from each of the existing A-series fabric filters will not be increased as a result of the proposed expansion project, as each of the A-series filters are currently capable of reaching their maximum throughput.

Ecology – Eastern Region has provided BACT applicability guidance that differs from Ecology's Lacey office. Specifically, Ecology – Eastern Region has stated that a more appropriate BACT applicability test should consider emissions sustained over a longer operational period (e.g., 12 months). On February 26, 2009, Brandon Green, REC, provided past actual throughput information for the Siemens reactor system (including A-series material handling equipment) to Robert Koster, Ecology – Eastern Region. This historical operating information verifies that the Moses Lake facility was capable of reaching the permitted operating levels for the Siemens reactor system (and corresponding A-series equipment) prior to the Plant 4 expansion project.

As such, the proposed project will not increase the maximum throughput, and subsequently, the potential emissions from the A-series fabric filters on either a maximum hourly or annual basis. Consequently, the Plant 4 permitting effort should not affect historical BACT determinations for A-series equipment, and the permitted limits for this equipment should be consistent with the approval conditions of Approval Order 07AQ-E223, Amendment #1 dated November 20, 2008.

9. **Proposed change:** REC requests that the June 26, 2009 date for filter failure instrumentation addition, listed in Condition 4.2, be extended to December 31, 2010.

   Reason: The silane production process, of which emission sources A1a, A1b, and A1d are included, is covered under Process Safety Management (PSM) requirements. PSM requires thorough engineering and review prior to implementation. Implementation is further complicated by the installation timeliness of supporting and process equipment. Typical modifications, governed by PSM, necessitate support and/or process equipment to be nonoperational during the installation process.

10. **Proposed change:** REC requests that in Conditions 4.1.1 and 5.1, only Method 5 be required to measure particulate matter emissions. Accordingly, REC requests that the requirement to use Method 202 be removed from these conditions.

    For consistency with the change requested above, REC requests that Condition 18.2.2 be modified as follows: "PM_{10} per 40 CFR 60, Appendix A, Method 5 and Method 202. ***(Only***

Method 5 is required for sources with no anticipated condensable portion such as MGS handling source)".

Reason: Condition 4.1.1 establishes particulate limits for fabric filters A1a, A1d, A13, and A32. Condition 5.1 establishes particulate limits for fabric filters B2, B3, B4, B1, C1, C2, C3, C4, C36A-B, and C37A-F. As all of the emission points covered under Condition 4.1.1 and 5.1 are material handling control equipment, the particulate matter emitted from these sources is expected to be filterable particulate only. Therefore, a Method 5 source test alone would accurately evaluate PM emissions from these systems. The emission points covered under Condition 4.1.1 and 5.1 are not expected to emit condensable particulate, which is not captured by a Method 5 test (and would only be measureable using Method 202).

11. **Proposed change:** The third sentence of Conditions 4.3.1, 5.14.1, 7.3.6, 9.2.4, and 11.2.6 states that "the presence of visible emissions from a filtration system at the facility shall trigger corrective measures defined in the facility operating and maintenance manual required in Condition 21 of this approval order." REC requests that this sentence be modified as follows: "The presence of visible emissions from a filtration system at the facility shall trigger ***a Method 9 reading and, if necessary,*** corrective measures…"

    For consistency with the change requested above, REC requests that Condition 21.6 be modified as follows: "…The CMMS shall at a minimum include corrective measures for filtration systems in the event that monthly Method 22 surveys discover visible emissions from any filtration system at the facility ***and subsequent Method 9 readings confirm the occurrence of an exceedance of an opacity standard.***"

    For consistency with the changes requested above, REC requests that Condition 22.1.2.2 be modified as follows: "The records to be kept shall including the following: Conditions ***4.3.1***, 5.14.1, ***7.3.6***, 9.2.4, and 11.2.6, records of opacity observations during monthly Method 22 surveys ***and follow-up Method 9 readings, as required***."

    Reason: Stack testing and monthly plant opacity survey requirements are established in Conditions 4.3.1, 5.14.1, 7.3.6, 9.2.4, and 11.2.6. Corresponding opacity limits are established in Conditions 4.1.7, 5.13, 7.3.3, 9.2.2.3, and 11.2.4, respectively. It should be noted that the observance of visible emissions during a Method 22 survey does not necessarily confirm the exceedance of an opacity standard and trigger the need for corrective measures. Rather, corrective measures should only be triggered in following scenario: following the observance of visible emissions during a Method 22 survey, opacity is quantified through a Method 9 reading, and the results of the Method 9 reading confirm an exceedance of the corresponding opacity standard.

12. **Proposed change:** REC requests that the grain-loading limit established by Condition 5.1 for emission points C36A, C36B, and C37 be updated from 0.005 gr/dscf to 0.01 gr/dscf. By updating the grain-loading limit established by Condition 5.1, the hourly emission limits

established by Conditions 5.10, 5.11, and 5.12 for the emission points C36A, C36B, and C37 will also be updated, as shown in Table 1.

Reason: A vendor guarantee for the powder collection system (C36 and C37) was submitted to Ecology on October 21, 2008 in response to Ecology's September 11, 2008 Incompleteness Determination. It should be noted that REC and Mott (the filter vendor) conducted preliminary testing on the efficiency of Mott's filters at controlling emissions of fine powder generated by the FBR process. These test results indicated that the powder collection system equipped with Mott filters will achieve compliance with Ecology's "rule of thumb" grain-loading level.[6] According to the filter vendor, "Mott has found that the lab data can be directly scaled to larger flow rates with no degradation in emissions performance as long as the test conditions match the operating conditions." However, as "Mott has no control over the actual operation of the filters we cannot offer any other guarantees or warranties other than those stated in our Standard Warranty clause," which corresponds to a grain-loading level of 0.01 gr/dscf.

Although test results indicate that the filter will achieve a lower grain-loading level than the vendor guarantee, REC requests that the BACT determination be based on the vendor guarantee for this system.

13. **Proposed change:** REC requests that the hourly emission rates established by Condition 5.7, 5.8, and 5.9 for emission points C2, C3, and C4, be updated as shown in Table 1.

    Reason: The emission limits established by Conditions 5.7, 5.8, and 5.9 are inconsistent with the emissions calculated for emission units C2, C3, and C4 in the NOC application and in the spreadsheet entitled "Plant 4 EI.xls," provided by Robert Koster, Ecology, to Brandon Green, REC, on March 12, 2009. The emissions calculated in this spreadsheet are correct based on REC's best available information and should be included in the permit.

14. **Proposed change:** REC requests that the term "PD" in the first sentence of Condition 5.14.1 be replaced with the term "permit."

    Reason: REC will eventually be subject to the final permit, not the preliminary determination.

15. **Proposed change:** REC requests that the first sentence in Condition 6.2.7.1 be modified from the current language ("within 180 days of the SMR systems becoming operational…") to "within 180 days of ***each SMR system*** becoming operational…"

    Reason: It is anticipated that each SMR system will begin operation on a different date. REC's proposed language ensures that the stack sampling requirement is required within 180 days of each

[6] In a letter from Robert Koster, Ecology Eastern Region, to John Hill, REC, on July 14, 2006 regarding a previous permitting effort for the Moses Lake facility, Mr. Koster stated that "our recent BACT determinations consider emission rates of 0.005 grains/dscf to be achievable for most baghouses."

system becoming operational. REC would like the operational flexibility to begin the operation of each SMR system on different dates.

16. **Proposed change:** REC requests that Conditions 6.2.7.2 and 6.2.7.4 be removed from the permit.

    Reason: Conditions 6.2.7.2 and 6.2.7.4 establish stack testing requirements for emission points B12 and C12, the hydrogen steam methane reformer deaerator vents. Stack testing requirements were not required for emission point B12 in the previous permit for the facility, Approval Order 07AQ-E223. B12 will not be modified as a part of the project. As such, the permit conditions for this unit should not be modified as a result of the Plant 4 permitting effort.

    Emission points B12 and C12 have relatively low emission rates. Carbon monoxide (CO) is the only pollutant emitted from these sources. Based on the maximum expected CO concentration and flowrate from this system (provided by the system vendor), each vent has the potential to emit 0.034 tons CO per year, which is only 0.7% of the NSR exemption threshold established for CO in WAC 173-400-110(5)(d). In addition, the vents have low flow rates which may make testing problematic. Given the de minimis emission rates for these release points, coupled with the logistical concerns of testing a low flowrate vent, REC contends that stack testing is not appropriate for these units.

17. **Proposed change:** REC requests that the hourly emission rates of NO_x and CO from the emission points A30 and A31 established in Conditions 7.1.2 and 7.1.3 be updated as shown in Table 1.

Reason: Annual emission limits for NO_x and CO emissions from hot oil heaters A30 and A31 were originally established in Order No. DE 95AQE-146 (8.58 tpy NO_x and 8.31 tpy CO combined emissions from the two heaters). Assuming continuous operation of the heaters, these annual limits correspond to an hourly emission rate of 0.95 lb/hr and 0.98 lb/hr for NO_x and CO, respectively. However, the hourly emission limits for NO_x and CO included in Condition 7.1.2 and 7.1.3 are lower than the corresponding emission limits established in Order NO. 95AQE-146.

Since A30 and A31 will not be modified as a part of the proposed project, BACT is not triggered for these emission sources, and the existing emission limits for this equipment should not be modified.

18. **Proposed change:** REC requests that Conditions 7.1.5, 13.5, 15.1.2, 15.1.3, and 15.2.7 be removed from the permit.

    Reason: Conditions 7.1.5, 13.5, 15.1.2, 15.1.3, and 15.2.7 establish new requirements for emission points that were previously permitted under Approval Order 07AQ-E223. These emission points will

not be modified as a part of the Plant 4 project. Accordingly, the permit conditions for these emission points should not be affected by the Preliminary Determination.

Condition 7.1.5 establishes new stack sampling requirements for emission points A30 and A31, which are existing, unmodified hot oil heaters.

Condition 13.5 establishes new stack sampling requirements for emission point A15, which is an existing, unmodified acid etching system. Furthermore, A15 processes material from REC's Butte facility, so the Plant 4 expansion of the Moses Lake facility will not affect throughput of this unit.

Condition 15.1.2 establishes a new metering requirement for emission point A18, which is also an existing, unmodified boiler. Condition 15.1.3 establishes new stack testing requirements for emission point A18.

Condition 15.2.7 establishes new stack sampling requirements for emission point B5, which is an existing, unmodified package boiler.

The Plant 4 expansion project will not affect the capacity or operation of any of this equipment. An assessment of BACT requirements for existing A-series equipment is presented in the reason for proposed change #7. To reiterate the main points of this evaluation, BACT requirements apply to individual emissions units that are modified. The first step in evaluating BACT applicability is to determine if there is a physical change or change in the method of operation to an existing emissions unit. If an existing emission unit does not undergo a physical change or change in the method of operation, then it does not trigger BACT. Ecology uses tests based on the maximum emission rate (hourly or annual) from the equipment before and after the project to determine whether a change occurred.

The existing A-series equipment is permitted under REC's existing permit, Approval Order 07AQ-E223, Amendment #1. The A-series equipment will not be physically modified because of Plant 4. The maximum hourly emission rate from each of the existing A-series emission units identified in this comment will not be increased as a result of the proposed expansion project, as each of the A-series devices are currently capable of reaching their maximum throughput. Furthermore, because the A-series process equipment has recently achieved operational levels in close proximity to the permitted limits, this historical operating information verifies that the Moses Lake facility was capable of reaching the permitted operating levels for the Siemens reactor system (and corresponding A-series equipment) prior to the Plant 4 expansion project.

As such, the proposed project will not increase the maximum throughput, and subsequently, the potential emissions from the A-series equipment on either a maximum hourly or annual basis. Consequently, the Plant 4 permitting effort should not affect historical BACT determinations for A-series equipment, and the permitted limits for this equipment should be consistent with

the approval conditions of Approval Order 07AQ-E223, Amendment #1 dated November 20, 2008.

With the exception of past actual operating data, this same rationale can be applied to the B-series package boiler to verify that the Plant 4 permitting effort should not affect operating requirements for B5. Furthermore, vendor guarantees have been obtained for NO_x and CO emissions from this system. REC requests that vendor guarantees be used as an alternative to stack testing requirements for B5 to confirm NO_x and CO emission levels.

19. **Proposed change:** REC requests that the Plant 3 hot oil heaters, identified in Condition 7.1.6 as B-23, B-24, and B-25 and defined through Condition 7.1.12.2, be allowed to remain as previously permitted in Conditions 6.2 through 6.2.5.2 in Approval Order 07AQ-E223.

Reason: Emission limits for the sources listed above were established in Amendment #1 to Approval Order 07AQ-E223, dated November 20, 2008. These units are not subject to a BACT review, and, as a result, the limits and conditions associated with these units should not be updated.

BACT requirements apply to individual emissions units that are modified. The New Source Review (NSR) program established under Washington Administrative Code (WAC) 173-400-110 adopts the definition of the term 'modification' consistent with Title 40 of the Code of Federal Regulations (CFR) Part 60 New Source Performance Standards (NSPS) Subpart A.[7] Under this definition, the term 'modification' only applies to a physical or operational change to an emission source that results in an increase in the ***maximum hourly*** emission rate of the emission unit.

The first step in evaluating BACT applicability is to determine if there is a physical or operational change to an existing emissions unit. Note that an "operational change" does not include an increase in the hours of operation in this case.[8] If an existing emission unit is not physically or operationally changed, then it does not trigger BACT.

The hot oil heaters themselves will not be physically or operationally changed as a result of the proposed expansion project, and therefore are not subject to BACT evaluation requirements as a result of the expansion project. Post-project, silane generated by the Siemens-side silane unit may be routed to either the Siemens reactors, Fluidized Bed Reactor (FBR) system, or the silane loading system. However, the Plant 3 hot oil heaters will not change in nature and the projected quantity of throughput will not change as a result of the project.

[7] 40 CFR 60.14(a)

[8] Mr. Al Newman, Ecology, clarified the definition of "operational modification" during REC's previous permit effort, in a November 21, 2006 phone call with Ms. Maren Seibold, Trinity.

20. **Proposed change:** REC requests that the second period "." be removed from Condition 7.1.11.

Reason: Removal of the second period will more accurately present the statement.

21. **Proposed change:** REC requests that the grain-loading limit, for emission point A36 established in Condition 7.3.1 be updated as shown in Table 1.

Reason: Permit conditions for the silane combustor/baghouse (A36) were established in Approval Order No. 07AQ-E223. In this Approval Order, A36 was permitted at its maximum capacity, so existing permit conditions do not require modification in order to accommodate the additional vent streams that will be fed to the combustor system. The NOC application included supporting information to confirm that A36 is of sufficient capacity to manage the additional process streams from Plant 4.

Section 4.9 of the original NOC application describes REC's efforts to obtain a more stringent grain-loading guarantee for the exhaust of the baghouse associated with A36. Although REC was able to obtain a vendor guarantee of 0.005 gr/dscf for most new material handling equipment, it should be noted that A36 is a unique control technology that cannot be directly compared to fabric filters that are used to control emissions from typical material handling operations for which the particle size distribution of the handled material is known. In REC's process, silane-rich streams are first combusted in the silane combustor, which is fired on auxiliary natural gas, to form silicon dioxide (a form of particulate matter (PM)). Based on REC's operational experience, the particulate matter formed by this combustion reaction is very fine; however, representative particle size distribution data for this stream is not available. This PM is then routed through a baghouse for emissions control.

Due to the mechanism of particulate formation and the uncertainty in the size of PM formed from the combustion of silane, the baghouse vendor would not guarantee a lower exhaust concentration than 0.01 gr/dscf. Based on discussions with the vendor, REC contends that 0.01 gr/dscf is an appropriate present-day BACT limit for A36. Therefore, REC requests that the permitted grain-loading limit remain at 0.01 gr/dscf, which was the limit established in Approval Order No. 07AQ-E223.

22. **Proposed change:** REC requests that the PM_{10} emission limits for emission point A36 established in Conditions 7.3.2 be updated as shown in Table 1.

Reason: Condition 7.3.2 establishes PM_{10} emission limits of 0.44 lb/hr and 1.88 tons per year from emission point A36. These emission limits, however, do not account for all of the PM_{10} emitted from emission point A36. PM_{10} is expected to be emitted from A36 through three mechanisms: a) particulate emissions from the combustion of natural gas, b) uncombusted particulate emissions controlled by the baghouse, and c) uncombusted silane emissions, assuming that all uncombusted silane remains in its gaseous form until it exits the baghouse, at which point it is converted to silicon dioxide.

23. **Proposed change:** REC requests a time extension from the current implementation date of June 26, 2009, identified in Condition 7.3.4, to December 31, 2010.

    Reason: The currently proposed resolution time is expected to be less than two (2) months from the approval date of the Silicon IV NOC Air Permit. In order to safely, successfully, and completely incorporate the required modifications a detailed engineering project will be required. In addition, various instrumentation, electrical equipment, and programming logic must be designed, procured, and scheduled to complete the changes as directed.

24. **Proposed change:** REC requests that Condition 7.5 be removed from the preliminary determination.

    Reason: Condition 7.5 does not provide any information or requirement data.

25. **Proposed change:** REC requests that the hourly PM_{10} emission rate for emission points B19 and B18 established in Conditions 7.6.3 and 7.7.2, respectively, be updated as shown in Table 1.

    Reason: The grain-loading limit for B18 and B19 is 0.02 gr/dscf. The exhaust flow rate of B18 and B19 is 764 dscfm. Calculating emissions using the grain-loading and the exhaust flow rate results in an hourly emission rate of 0.13 lb/hr. It should be noted that the 0.13 lb/hr emission rate was calculated correctly in Ecology's emission inventory for REC but was not carried over to the Plants 1, 3, 4 Preliminary Determination.

26. **Proposed change:** REC requests that the hydrogen chloride (HCl) exhaust concentration limit for emission points B19 and B18 established in Conditions 7.6.4 and 7.7.3, respectively, be updated as shown in Table 1. Additionally, REC requests that the HCl hourly emission rate for emission points B19 and B18 established in Conditions 7.6.5 and 7.7.4 be updated as shown in Table 1.

    Reason: HCl emissions from B19 and B18 are calculated using the inlet stream chlorine composition, a control efficiency of 99.9%, and an exhaust flow rate of 764 scfm. The hourly emission rate equates to 0.207 lb/hr HCl for both B19 and B18. Based on the HCl emission rate of 0.207 lb/hr and the exhaust flow rate of 764 scfm, the concentration of HCl in the exhaust is 47.8 ppmvd. These flow rates correspond to normal operation of this equipment. It should be noted that B18 and B19 are used for turnaround operating scenarios as well. Emissions during turnaround operations are estimated as follows: B18 = 1.36 lb/hr HCl, 175 ppmvd HCl; B19 = 7.36 lb/hr HCl, 170 ppmvd HCl.

27. **Proposed change:** REC requests that the term “inlet” be removed from the first sentence of Condition 7.6.7.2.

    Reason: Condition 7.6.7.2 requires that stack sampling is conducted at the stack B19 inlet and exhaust. The permitted emission limits for B19 are established as exhaust concentrations. As such, stack sampling at the stack inlet is not necessary. REC believes that the requirement to sample at the stack inlet of B19 is held over from a previous permit draft in which the emission limits for B19 were based on a percent reduction requirement.

28. **Proposed change:** REC requests that the Approval Condition listed in Condition 9.2.2.3 be changed from 'Approval Condition 17' to 'Approval Condition 18.2.1'.

    Reason: The modification is proposed to reference the applicable, opacity pertinent, Approval Condition.

29. **Proposed change:** REC requests that Condition 7.7.7 be removed from the permit.

    Reason: Condition 7.7.7 establishes recordkeeping requirements for operating hours for emission point B18. The operation of B18 is not limited in any way in the permit. In addition, B18 is essentially expected to be operated as a continuous source of emissions. Therefore, REC believes that records of the use of B18 are not necessary to ensure compliance with the permit.

30. **Proposed change:** REC requests that the grain-loading limit for emission point C20 established by Condition 8.2.1 be updated as shown in Table 1. Additionally, REC requests that the PM_{10} hourly emission limit established by Condition 8.2.1 and the silane hourly emission limit established by Condition 8.2.2 be updated as shown in Table 1.

    Reason: Per Ecology's request, REC commissioned the scrubber vendor (Croll Reynolds) to evaluate grain-loading concentrations for each of the new and modified scrubber systems. The results of Croll Reynolds' evaluation show that an appropriate grain-loading limit for emission point C20 is approximately 0.10 gr/dscf. For conservatism, Croll Reynolds has assumed that 25% of silane in the scrubber exhaust stream decomposes to silicon dioxide as a result of the source test methodology to determine the grain-loading limit.[9] Even without considering a contribution from silane, the calculated grain-loading for C-20 exceeds Ecology's "rule of thumb" for scrubbers. REC provided supporting information related to Croll Reynolds' analysis in the incompleteness determination response submitted to Ecology in October 2008. REC contends that the grain-loading values developed by Croll Reynolds represent the best estimates currently available for emissions resulting from this equipment and accounting for the implementation of BACT-level controls; therefore, these estimates serve as an appropriate basis to establish BACT-level limits in the corresponding approval order. The hourly emission rate of silane from emission point C20 was provided by Fluor, the design firm for the Plant 4.0 project, as 0.38 lb/hr silane. Assuming that all silane converts to particulate matter in the form of silicon dioxide, PM_{10} emissions from emission point C20 are calculated to be 0.71 lb/hr.

31. **Proposed change:** REC requests that the grain-loading limit for emission point B14 established by Conditions 9.2.5.1 be updated as shown in Table 1.

    Reason: The grain-loading limit for the FBR Process Vent Stack (B14) was established as 0.01 gr/dscf in Approval Order 07AQ-E223. This unit will not be modified as part of the proposed project.

[9] Because the silane loading scrubber includes silane in the exhaust stream, there is a possibility for unscrubbed silane to decompose into silicon dioxide and hydrogen gas as the scrubber exhaust exits the stack, though the rate of silane decomposition is unknown. Since this decomposition occurs after release from the scrubber, it is generally considered a secondary reaction. However, the test method used to demonstrate compliance with the grain-loading limit may cause some silane to convert to silicon dioxide, which would contribute to the measured grain-loading concentration of the system.

Therefore, a BACT review is not required for this source, and the grain-loading limit for the source should not be changed in the Preliminary Determination.

32. **Proposed change:** REC requests that the records mentioned in Condition 9.2.5.5 be maintained on-site for a period of three (3) years. Condition 9.2.5.5 does not currently detail a specific retention time period.

    Reason: Numerous records, receipts, and files are stored and maintained at the REC facility. The predetermined time period is requested to purge unnecessary files, as well as, provide specific guidelines for record retention.

33. **Proposed change:** REC requests that the grain-loading limit for emission point B20 established by Conditions 9.2.6.1 be updated as shown in Table 1. Additionally, REC requests that the hourly emission limit for emission point B20 established by Condition 9.2.6.2 be updated as shown in Table 1.

    Reason: The scrubber vendor is unwilling to guarantee an increased particulate removal efficiency for B20. However, based on pilot testing, it is expected that the scrubber will be significantly more efficient than the vendor guarantee. The state-required grain-loading limit of 0.1 gr/dscf was assigned to B20 in the previous Approval Order, under Condition 8.2.5.1 of Approval Order 07AQ-E223, Amendment #1 (dated 11/20/2008). REC requests that the existing limit established for B20 Approval Order 07AQ-E223 remain in the Plant 4 permit.

34. **Proposed change:** REC requests that the extra period "." be removed from Condition 9.2.6.4.1 within the reference to Condition 18.2.3.

    Reason: Removal of the extra period will more correctly identify the intended Approval Condition.

35. **Proposed change:** REC requests that the silane feed rate identified in Condition 9.2.7.1 either be updated to 90.0 kg/hr or removed from the Approval Order.

    Reason: Restrictions placed upon the silane gas feed to individual pieces of process equipment, of which the demonstration fluid bed reactor is included, limits the ability to enhance future improvements, develop operational flexibility, and further the technological advancement of the process. No change is proposed to the exhaust emissions from the demonstration fluid bed reactor. The current grain- loading limitation of 0.005 gr/dscf, specified in Condition 9.2.7.2, has no change proposed.

36. **Proposed change:** REC requests that the grain-loading limit for emission points B10 and C10 established by Condition 11.1.1 be updated as shown in Table 1. Additionally, REC requests that the PM_{10} hourly emission limit for emission points B10 and C10 established by Condition 11.1.2 be updated as shown in Table 1.

    Reason: The grain-loading limit for B10 and C10 is 0.04 gr/dscf. This grain-loading limit was established for B10 in Approval Order 07AQ-E223. In the incompleteness determination response

submitted to Ecology by REC in October 2008, REC provided supporting information that the grain-loading limit for C10 should be equal to the grain-loading limit of B10. Based on a grain-loading limit of 0.04 gr/dscf and a flow rate of 302 dscfm, the PM_{10} hourly emission limit should be 0.11 lb/hr.

37. **Proposed change:** REC requests that the HCl exhaust concentration limit for emission points B10 and C10 established by Condition 11.1.3 be updated as shown in Table 1. Additionally, REC requests that the HCl hourly emission limit for emission points B10 and C10 established by Condition 11.1.4 be updated as shown in Table 1.

    Reason: HCl emissions from B10 and C10 are calculated using 24-hour average uncontrolled HCl emissions and a control efficiency of 99.9% for HCl. The hourly emission rate equates to 0.027 lb/hr HCl, on a 24-hour average. Based on the HCl emission rate of 0.027 lb/hr and the exhaust flow rate of 302 scfm, the concentration of HCl in the exhaust of HCl in the exhaust is 15.9 ppmvd.

38. **Proposed change:** REC requests that Condition 15.2.3 be removed from the Approval Order.

    Reason: Removal of Condition 15.2.3 is requested because such required notification has been previously provided to Ecology and subsequent 'initial start-up' is not expected.

39. **Proposed change:** REC requests that Conditions 12.1, 12.2 and 12.3 be removed from the permit.

    Reason: The limits established in Conditions 12.1, 12.2 and 12.3 are identical to the limits established in Conditions 3.3, 3.4, and 3.5, respectively. Since it is not necessary to establish the same limit in multiple permit conditions, this proposed change effectively streamlines the permit requirements.

Table 1. Proposed Emission Limits

Proposed Change No.	Unit	Pollutant	Permit Condition	Limit Units	Current Limit in Preliminary Determination	REC's Proposed Limit	Basis of Proposed Limit
0	A1a	PM_{10}	4.1.1	gr/dscf	0.005	0.01	Limit established in Approval Order 07AQ-E223, Amendment #1
0	A1b	PM_{10}	4.1.1	gr/dscf	0.005	0.01	Limit established in Approval Order 07AQ-E223
0	A1d	PM_{10}	4.1.1	gr/dscf	0.005	0.01	Limit established in Approval Order 07AQ-E223
0	A13	PM_{10}	4.1.1	gr/dscf	0.005	0.01	Limit established in Approval Order 07AQ-E223
0	A32	PM_{10}	4.1.1	gr/dscf	0.005	0.01	Limit established in Approval Order 07AQ-E223
0	A1a	PM_{10}	4.1.2	tpy	0.015	0.03	Calculated using estimated flow rate and proposed grain-loading limit
0	A1b	PM_{10}	4.1.3	tpy	0.0015	0.003	Calculated using estimated flow rate and proposed grain-loading limit
0	A1d	PM_{10}	4.1.4	tpy	0.002	0.004	Calculated using estimated flow rate and proposed grain-loading limit
0	A13	PM_{10}	4.1.5	tpy	0.01	0.02	Calculated using annual throughput and 99.9% control
0	A32	PM_{10}	4.1.6	tpy	0.1	0.2	Based on Order Nos. DE 94AQ-E106 and DE 97AQ-E109, 2nd amendment
0	C36A	PM_{10}	5.1	gr/dscf	0.005	0.01	Vendor-guaranteed grain-loading limit
0	C36B	PM_{10}	5.1	gr/dscf	0.005	0.01	Vendor-guaranteed grain-loading limit
0	C37 (A-F)	PM_{10}	5.1	gr/dscf	0.005	0.01	Vendor-guaranteed grain-loading limit
0	C36A	PM_{10}	5.10	lb/hr	0.004	0.009	Calculated using flow rate and proposed grain-loading limit
0	C36B	PM_{10}	5.11	lb/hr	0.004	0.009	Calculated using flow rate and proposed grain-loading limit
0	C37 (A-F)	PM_{10}	5.12	lb/hr	0.004	0.0043	Calculated using flow rate and proposed grain-loading limit (emissions for each filter)
0	C2	PM_{10}	5.7	lb/hr	0.044	0.047	Calculated using flow rate and grain-loading limit of 0.005 gr/dscf

Proposed Change No.	Unit	Pollutant	Permit Condition	Limit Units	Current Limit in Preliminary Determination	REC's Proposed Limit	Basis of Proposed Limit
0	C3	PM_{10}	5.8	lb/hr	0.008	0.009	Calculated using flow rate and grain-loading limit of 0.005 gr/dscf
0	C4	PM_{10}	5.9	lb/hr	0.008	0.009	Calculated using flow rate and grain-loading limit of 0.005 gr/dscf
0	A30, A31	NO_x	7.1.2	lb/hr	0.59	0.95	Based on Order No. DE 95AQ-E146 (emission rate for each heater)
0	A30, A31	CO	7.1.3	lb/hr	0.6	0.98	Based on Order No. DE 95AQ-E146 (emission rate for each heater)
0	A36	PM_{10}	7.3.1	gr/dscf	0.005	0.01	Limit established in Approval Order 07AQ-E223; 0.01 gr/dscf was lowest guarantee vendor willing to provide
0	A36	PM_{10}	7.3.2	lb/hr	0.44	1.08	Includes emissions from natural gas combustion, baghouse particulate, and baghouse silane (PD limit only considers baghouse particulate)
0	A36	PM_{10}	7.3.2	tpy	1.88	4.75	Includes emissions from natural gas combustion, baghouse particulate, and baghouse silane
0	B19	PM_{10}	7.6.3	lb/hr	0.06	0.13	Calculated using flow rate and grain-loading of 0.02 gr/dscf
0	B18	PM_{10}	7.7.2	lb/hr	0.06	0.13	Calculated using flow rate and grain-loading of 0.02 gr/dscf
0	B19	HCl	7.6.4	ppmvd	12	47.8	Calculated using proposed emission rate and exhaust flow rate at normal operations
0	B19	HCl	7.6.5	lb/hr	0.024	0.207	Calculated using inlet stream composition and 99.9% control at normal operations
0	B18	HCl	7.7.3	ppmvd	12	47.8	Calculated using proposed emission rate and exhaust flow rate at normal operations
0	B18	HCl	7.7.4	lb/hr	0.024	0.207	Calculated using inlet stream composition and 99.9% control efficiency at normal operations
0	C20	PM_{10}	8.2.1	gr/dscf	0.02	0.1	Scrubber vendor-recommended grain-loading limit

Proposed Change No.	Unit	Pollutant	Permit Condition	Limit Units	Current Limit in Preliminary Determination	REC's Proposed Limit	Basis of Proposed Limit
0	C20	PM_{10}	8.2.1	lb/hr	0.05	0.71	Based on silane emissions and assumption that all silane converts to silicon dioxide
0	C20	Silane	8.2.2	lb/hr	0.03	0.38	Emission rate provided by project design company
0	B14	PM_{10}	9.2.5.1	gr/dscf	0.005	0.01	Limit established in Approval Order 07AQ-E223
0	B20	PM_{10}	9.2.6.1	gr/dscf	0.02	0.1	Limit established in Approval Order 07AQ-E223
0	B20	PM_{10}	9.2.6.2	lb/hr	0.03	0.14	Calculated using design flow rate and proposed grain-loading limit
0	B10, C10	PM_{10}	11.1.1	gr/dscf	0.02	0.043	Vendor-supported grain-loading limit
0	B10, C10	PM_{10}	11.1.2	lb/hr	0.05	0.11	Calculated using flow rate and proposed grain-loading limit
0	B10, C10	HCl	11.1.3	ppmvd	8	15.8	Calculated using proposed emission rate and exhaust flow rate
0	B10, C10	HCl	11.1.4	lb/hr	0.012	0.027	Calculated using uncontrolled 24-hr average emission rate and 99.9% control

40. **Proposed change:** REC requests that further clarification be provided to condition 17.3.5 regarding equipment cleaning activities. The requested clarification pertains to the second sentence which reads "… of solvent associated with equipment cleaning activities outside…". The proposed change would state "… of solvent associated with paint booth spray equipment cleaning activities outside…".

    Reason: Further description of the intended equipment to be cleaned will remove the potential for future misinterpretation.

41. **Proposed change:** REC requests that APPROVAL CONDITION 22 mentioned in Condition 18.9 be changed to APPROVAL CONDITION 23.

    Reason: The change is requested to more correctly reference the intended compliance testing approval condition.

42. **Proposed change:** REC requests that the conditions listed in Condition 22.1.2.2 be changed from " 4..2.1, 5.14.1, 9.2.4, and 11.2.6 " to " 4.3.1, 5.14.1, 7.3.6, 9.2.4, and 11.2.6".

    Reason: The change is requested to more correctly reference the intended conditions.

43. **Proposed change:** REC requests that the conditions listed in Condition 22.1.2.4 be changed from " 12.6, 13.6, 14.2, 17.1.5, 17.2.5, and 19.1.6 " to " 3.3, 3.4, 3.5, 3.6, 12.5.1, 13.5.3, 14.2, 15.2.4, 17.1.5, 17.2.5, and 19.1.6 ".

    Reason: The change is requested to more correctly reference the intended conditions.

44. **Proposed change:** REC requests that APPROVAL CONDITION 22.1.2 mentioned in Condition 23.2 be changed to APPROVAL CONDITION 22.1.3.

    Reason: The change is requested to more correctly reference the intended conditions.

If you have any questions regarding the comments contained in the letter, please contact me (509-766-9374) or Maren Seibold at Trinity Consultants (253-867-5600).

Sincerely,

REC SOLAR GRADE SILICON LLC

Brandon Green
Environmental Engineer

Attachments

cc: Mr. Greg Flibbert – Washington State Department of Ecology
Mr. Russ Hamilton – REC Solar Grade Silicon LLC
Ms. Maren Seibold – Trinity Consultants
Mr. Aaron M. Day, P.E.– Trinity Consultants
Mr. Chip Robison – REC Solar Grade Silicon LLC

Appendix #2: Text of McElroy Public Comments

McElroy Specific Comment No. 1:

In your response to comments and community concerns, please address the current regulatory and enforcement status of the facility and whether or not DOE intends to perform an environmental audit and/or require SEPA review of those aspects of the facility that are affected by the Plant 4 NOC but that have not been reviewed under SEPA.

Response:

The current regulatory status of the facility is that of a "synthetic minor" source: REC has opted to take voluntary emission limits for NOx, HCl, Methanol, and PM to avoid emission rates that would require a Federal Air Operating Permit. Synthetic Minor sources are monitored (audited) under the terms of the State Compliance Assurance Agreement which includes a full compliance evaluation (as defined in the agreement) every five years. REC's preliminary determination includes significantly expanded stack sampling and enhanced parametric monitoring to ensure that they meet the conditions of approval. Ecology's authority to revisit the lead agency's SEPA threshold determination is limited. Ecology has instead mitigated air quality impacts to the extent of our authority in the approval order.

McElroy Specific Comment No. 2:

In your response to comments and community concerns, and given REC's weak compliance record and non-disclosure of relevant information, please address whether the air quality program has investigated the compatibility and consistency of the information supplied by REC with other public documents and regulatory requirements under EPCRA, the Risk Management Plan under 40 CFR Part 68, or the worker safety documentation from the Washington Department of Labor and Industries.

Response:

EPCRA, 40 CFR 68, and L&I Worker Safety programs are not within the jurisdiction of the Air Quality Program. The preliminary determination includes a condition that REC comply with 40 CFR 68 but, in that 40 CFR 68 outlines a Federal program not delegated to the State of Washington, use of and compliance with the condition must be determined by Region 10 EPA.

McElroy Specific Comment No. 3:

The Preliminary Determination order should be revised and re-issued for public comment. According to the March 6, 2009 "Technical Support Document," in Section 4.0 "The NOC Application" REC has failed or refused to provide essential data requested by DOE to determine BACT for control devices in historical

operations in Plant 1. Missing data forced DOE to set presumptive BACT levels, apparently without data, modeling, or other means to demonstrate compliance. Because this is a historical facility, the refusal of REC to supply this information lacks practical or technical justification. Proceeding to public comment and hearing without this information violates WAC 173-400-171(3), which allows public comment (and a hearing if requested) *after* all the required information and preliminary determinations are made.

Response:

Presumptive BACT/t-BACT determinations have been made for REC air pollution control equipment plant-wide ("Plants 1,3, and 4") for emission points where Ecology believes the control equipment should and can perform better than REC proposed. Each presumptive BACT determination reduces emission rates from those proposed by REC in its application materials. If testing demonstrates REC does not achieve these presumptive BACT levels, Ecology will take appropriate enforcement action. Modeling of facility emissions was performed for the emission rates proposed by REC. Lower emission rates reflected in the presumptive BACT levels will add additional margin of public safety. Public review of these determinations has been provided.

McElroy Specific Comment No. 4:

REC's failure to provide the information discussed in Comment 3 above is compounded because the material alteration of Plant 1 appears to have occurred in conjunction with the pre-mature and unpermitted construction of Plant 3 or Plant 4. Any additional operation of Plant 1 without proper information, BACT, and t-BACT is unjustified for practical and technical reasons since this a self-inflicted hardship arising from REC knowing refusal to follow applicable law.

Response:

As stated in the previous response, presumptive BACT has been established for those control devices in Plant 1 where an emission increase could be expected. Presumptive BACT does represent a hardship for REC, but will upgrade the control devices plant-wide to a 'state of the art' condition.

McElroy Specific Comment No. 5:

In regard to Equipment B23, B24, and B25 hot oil heaters, what is the justification or necessity for a one year delay in requiring the retrofit to ULNB to achieve 9 ppm NOx, 30 ppmv CO especially if the current equipment perpetuates a prior non-compliance with BACT when REC designed, modified, or constructed in non-compliance with New Source Review?

Response:

During the permitting of the Plant 4 hot oil heaters, Ecology determined that the Plant 3 BACT determination was flawed: manufacturer-supplied emission levels for the combustion of hydrogen (the reason for the less restrictive BACT determination) appear to be based on erroneous calculations, and REC has not contracted for nor plumbed a supply of hydrogen to fuel the heaters. The Plant 3 hot oil heaters were installed prior to Ecology's recognition of these issues and it was determined that one year was a reasonable period of time for retrofit.

McElroy Specific Comment No. 6:

In regard to A14 Siemens Silane Dump Vent, what is the design basis for allowance of 480 hours per year and how will use be reported, how will compliance be documented, and how will release be measured? What are the impacts at the nearest fence line, which is believed to be the Air Energy Industrial Park property?

Response:

Use of the A-14 vent was not limited by previous Approval Orders. Plant 3 and Plant 4 expansions were used as opportunity to limit this use to the maximum of 480 hours per year. It is anticipated that use of this vent may be significantly less than that as the Siemens silane production equipment is now connected to the Plant 3 and 4 systems, providing a reservoir for excess previously unavailable. The modeled impacts of 480 hours of use of this stack combined with the silane releases of the rest of the facility were determined to be acceptable in accordance with WAC 173-460. REC is required to monitor the nature and extent of flow through the stack.

McElroy Specific Comment No. 7:

In regard to A12 a, b, c, and d cooling towers is PM10 the only pollutant or is there an aerosol or toxic component? How is compliance with the work practice determined and reported? How are emissions measured?

Response:

PM10 from cooling towers is a result of mist carryout and the impurities in the water supply. Some of the impurities are toxics listed in WAC 173-460. Emissions are calculated, considering the design of each tower, the quality of the water supply, and the degree to which water is concentrated prior to being blown down. The 2500 ppmw limit is contained in REC's NPDES permit with a requirement

that it be measured three times per week. The limit has also been added as an approval condition in response to both REC's comments and this one.

McElroy Specific Comment No. 8:

In regard to generators and pumps A37 through A41 how is the 260 hour threshold measured, recorded, and reported?

Response:

A non-resettable hours meter is required on all emergency and stand-by engines at this facility. The hours of use of each device will be a part of the annual report of emissions from the facility.

McElroy Specific Comment No. 9:

In regard to all unplanned chemical releases at the facility, the NOC order should require that REC provide notice to DOE and the affected community. The permit language should expressly reject REC's prior practice of only reporting leaks and chemical releases that are not contained on REC's boundary. First, that is not the legal standard. Second, given the properties of many of the chemicals and releases, REC and adjacent property owners have no way to measure precisely whether airborne chemical releases extend beyond property boundaries.

Response:

Ecology agrees with this comment. The reporting condition in the preliminary determination is rewritten with the intent that Ecology be notified of all unscheduled releases within 2 hours of an incident. It is the responsibility of REC and Grant County Emergency Response to notify the affected community. Emergency notification is not within the purview of Ecology's air quality approval order.

McElroy Specific Comment No. 10:

Prior to issuance of any new NOC order, REC must be required to certify its current compliance with 40 CFR Part 68 and to disclose all offsite impact zones on a map that can be made available to the affected property owners and the public. Because of the major modification of existing facilities and the piecemeal and delayed permitting process, the affected community and the public, including adjacent property owners have no confidence that REC is currently in compliance with 40 CFR Part 68 for all facilities and in the configuration with which it currently operates. Preliminary Determination 2.5 should be redrafted to read "The facility shall certify under oath by the responsible corporate officer, and subject to penalty of perjury, that the facility is in full and continuing compliance with all applicable requirements of 40 CFR 68. In the event of any non-compliance, the

Washington State Department of Ecology and all adjacent property owners shall be immediately notified."
Response:

Ecology is not delegated administration of 40 CFR 68. It is unclear how the condition in the preliminary determination, requiring compliance with a Federal program in a State permit, will be implemented. It may just serve as a reminder to REC and be used by EPA Region 10 as an enforcement option if REC fails to comply.

McElroy Specific Comment No. 11:

The notice provisions Paragraph 2.1 of the Preliminary Determination is essential but the reporting requirements should apply to "all" unplanned emissions and/or equipment or process malfunctions (whether emissions are "confirmed" or not). This would be in addition those emissions arising from "process or control devise upset or malfunction." REC has a documented history on not confirming upsets and underestimating the cause, duration, and size of upset events. The current language provides loopholes that invite REC to violate the spirit of the requirement by a parsing of words.

Response:

As indicated in the response to comment 9 above, Ecology has rewritten the reporting condition in the preliminary determination to address this concern shared by the public and Ecology.

McElroy Specific Comment No. 12:

When does the prohibition on the use of hydrogen produced by SMR systems take affect? What is the purpose of this limitation? What is the planned use or disposal of the hydrogen produced and what is the assurance that it will not be sold for fuel use at adjacent locations?

Response:

The limitation on use of hydrogen is specifically that it not be used as fuel in a combustion device at the facility. It is effective upon issuance of the Approval Order. REC's end products all require ultrapure silane which is produced in a sequence of reactors. The first of the reaction steps is done in a heated pressurized column in which hydrogen (H_2) reacts with gasified impure silicon (metallurgical grade Si) to form silane: SiH_4. Silane will be sold as-is (gas plant), or as Silicon granules (fluid bed reactors), or as rods (Siemens reactors). From the reactors, hydrogen is recovered and recycled to the hydrogenation columns or released.

McElroy Specific Comment No. 13:

What is the justification for allowing the use of presumptive BACT and t-BACT levels at the facility when the normal permit process is to design, model or demonstrate compliance, and then commence construction? Is this method simply an accommodation to REC rather than requiring compliance with the regulations?

Response:

Completely contrary to an accommodation to REC, presumptive BACT and t-BACT levels required by this Order are appreciably more restrictive than those proposed in REC's application. The application included modeling of the higher values as REC proposed in its application. Modeling indicated satisfaction of WAC 173-460 and the ambient air quality standards at the rates higher than allowed by this Order.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

IN THE MATTER OF APPROVING A NEW)
CONTAMINANT SOURCE FOR) **Preliminary Determination**
REC SOLAR GRADE SILICON, LLC)

TO: Mr. Russ Hamilton, Director of Operations
REC Solar Grade Silicon, LLC
3322 Road "N" NE
Moses Lake, Washington 98837

Equipment Evaluated for this preliminary determination of approval consists of the following:

	Equipment ID	Description	Control Equipment ID	Control Equipment Description
Plant 1	Raw Material (MGS) Receiving, Handling			
	A1a	Silicon Transfer to Feed Hopper	A1a	Fabric Filter
	A1b	Hopper Storage Vent	A1b	Fabric Filter
	A1d	Silicon Feed Hopper	A1d	Fabric Filter
	Silane Production, Purification			
		4-Hydrogenation/distillation Columns	Silane-Rich Streams to A36	A36 = Silane Combustor/Fabric Filter
			Metal-Chloride-Rich Streams to B10, C10	Metal Chloride Neutralization and drying trains, 3 Trains, B10, C10 (2) Scrubbers
			Chlorosilane Rich (light-ends) Streams to B18	B18 = 3-Stage Process Scrubber: Spray Chamber, Venturi, Packed Column
			Maintenance Vents to B19	B19 = 3-Stage Maintenance Scrubber: Spray Chamber, Venturi, Packed Column
	Plant 1 Polycrystalline Silicon Production			
	A11aA	Siemens Reactor Vents (47 A-style Reactors)	None	Barometric Seals on Pressure Relief following Batch
	A11aB	Siemens Reactor Vents (8 B-style Reactors)	None	Barometric Seals on Pressure Relief following Batch
	A11aH	Siemens Reactor Vents (6 H-style Reactors)	None	Barometric Seals on Pressure Relief following Batch
	A11aJ	Siemens Reactor Vents (6 J-	None	Barometric Seals on

	Equipment ID	Description	Control Equipment ID	Control Equipment Description
		style Reactors)		Pressure Relief following Batch
	A11aT	Siemens Reactor Vents (1 Test Reactor)	None	Barometric Seals on Pressure Relief following Batch
	A14	Siemens Silane Dump Vent	None	Used No More Than 480 Hours Per Year
	A11c	TCD Analyzer Vents (21)	None	
	A-13	Siemens Cleaning Wet Vacuum	A13	Wet Vac Fabric Filter
	Plant 1 Other Production Equipment			
	A15	Acid Etching of Poly Rod	A15	Acid Etching Neutralization Scrubber
	A32	East Side Finishing Room (Lathes, Grinders)	A32	Stairmond Cyclones followed by Wet Impingement Scrubber
	A33a	West Side Finishing Room System 1	A33a	Stairmond Cyclone followed by Wet Cyclone Scrubber
	A33b	West Side Finishing Room System 2	A33b	Stairmond Cyclone followed by Torit Cartridge Filter
	A35	Fluid Bed Demonstration Reactor	A35	Degasser Filter (Sintered Metal)
	A28, A29	Slim Rod Production with Flat Zone Technology	None	None
	Plant 1 Support Equipment			
	A18	12 mmBTU/hr Plant Boiler	None	Low NOx Burners with FGR
	A30, 31	25 mmBTU/hr each Hot Oil Heaters	None	Low NOx Burners with FGR
	A12a,b, c, d	(4) Cooling Towers	None	Work Practice to maintain TDS below 2500 ppm, high efficiency mist eliminators
	A37	Utility Building Generators 1135 hp	None	ULS diesel, 260 hours per year max
	A38	Poly Generator Building 1 1135 hp	None	ULS diesel, 260 hours per year max

	Equipment ID	Description	Control Equipment ID	Control Equipment Description
	A39	Poly Generator Building 2 1232 hp	None	ULS diesel, 260 hours per year max
	A40	Plant 1 Fire Suppression Pump Engine 187 hp	None	ULS diesel, 260 hours per year max
	A41	Plant 1 Fire Suppression Pump Engine 187 hp	None	ULS diesel, 260 hours per year max
	A44	Maintenance Paint Booth	None	98% Filters, Enclosed Gun Cleaner, HVLP or equivalent Spray Guns, Limited use
Plant 3	Raw Material (MGS) Receiving, Handling			
	B1	MGS Feed Hopper Vent	B1	Fabric Filter
	B2	MGS Unload Building Vent	B2	Fabric Filter
	B3	MGS Silo Vent A	B3	Fabric Filter
	B4	MGS Silo Vent B	B4	Fabric Filter
	Silane Production, Purification			
		2-Hydrogenation/distillation Columns	Silane-Rich Streams to A36	A36 = Silane Combustor/Fabric Filter
			Metal-Chloride-Rich Streams to B10, C10	Metal Chloride Neutralization and drying trains, 3 Trains, B10, C10 (2) Scrubbers
			Chlorosilane Rich (light-ends) Streams to B18	B18 = 3-Stage Process Scrubber: Spray Chamber, Venturi, Packed Column
			Maintenance Vents to B19	B19 = 3-Stage Maintenance Scrubber: Spray Chamber, Venturi, Packed Column
	Plant 3 Bead Silicon Production			
	FBR	12 Pairs Fluidized Bed Reactors in FBR Building	C36A	West Side Fabric Filter
			C36B	West Side Fabric Filter
			C37A	East Side Fabric Filter
			C37B	East Side Fabric Filter
			C37C	East Side Fabric Filter

	Equipment ID	Description	Control Equipment ID	Control Equipment Description
			C37D	East Side Fabric Filter
			C37E	East Side Fabric Filter
			C37F	East Side Fabric Filter
			B14	Sintered Metal Filter on FBR Vent
	B20	Filter Powder Wetting System	B20	Wet Scrubber
	B7	FBR Vent Filter	B7	Sintered Metal Filter
	B13	Wet Vacuum System	B13	Venturi followed by Fabric Filter
	Plant 3 Support Equipment			
	B5	Package Boiler 24 mmBTU/hr	B5	LoNOx Burners to 9 ppmv NOx, 30 ppmv CO
	B6	Emergency Generator 2682 hp	B6	Tier II Engine, ULSD
	B8	Fire Suppression Pump Engine 460 hp	B8	Subpart IIII Table 4 Engine, ULSD
	B23,24, 25	(3) 56 mmBTU/hr Hot Oil Heaters	B23, 24, 25	Initially LoNOx Burners to 20 ppmv NOx, 30 ppm CO. After one year, to be retrofit to 9 ppm NOx, 30 ppmv CO
	B9	Trona Bin (Metal Chloride Neutralization)	B9	Bin Vent Filter
	B21	Refrigeration Systems	B21	LDAR
	B11	Steam Methane Reformer (SMR)	B11	System Design
	B12	SMR Deaerator	B12	System Design
	B26	SMR Cooling Tower	B26	Work Practice to limit TDS to 2500 ppm, High Efficiency Mist Eliminator
Plant 4	Raw Material (MGS) Receiving, Handling			
	C1	MGS Feed Hopper Vent	C1	Fabric Filter
	C2	MGS Unload Building Vent	C2	Fabric Filter
	C3	MGS Silo Vent A	C3	Fabric Filter
	C4	MGS Silo Vent B	C4	Fabric Filter
	Silane Production, Purification, Compression, Storage, Loading			
		2-Hydrogenation/distillation Columns	Silane-Rich Streams to A36	A36 = Silane Combustor/Fabric Filter

	Equipment ID	Description	Control Equipment ID	Control Equipment Description
			Metal-Chloride-Rich Streams to B10, C10	Metal Chloride Neutralization and drying trains, 3 Trains, B10, C10 (2) Scrubbers
			Chlorosilane Rich (light-ends) Streams to B18	B18 = 3-Stage Process Scrubber: Spray Chamber, Venturi, Packed Column
			Maintenance Vents to B19	B19 = 3-Stage Maintenance Scrubber: Spray Chamber, Venturi, Packed Column
	C20	Silane Loading Relief Venting	C20	Wet Scrubber
	C42	Silane Loading Lab Vent	NA	None
	Plant 4 Support Equipment			
	C6	Emergency Generator 2682 hp	C6	Tier II Engine, ULSD
	C8	Fire Suppression Pump Engine 460 hp	C8	Subpart IIII Table 4 Engine, ULSD
	C23,24, 25	(3) 56 mmBTU/hr Hot Oil Heaters	C23, 24, 25	Ultra LoNOx Burners to 9 ppm NOx, 30 ppmv CO
	C9	Trona Bin (Metal Chloride Neutralization)	C9	Bin Vent Filter
	C21	Refrigeration Systems	C21	LDAR
	C11	Steam Methane Reformer (SMR)	C11	System Design
	C12	SMR Deaerator	C12	System Design
	C26	SMR Cooling Tower	C26	Work Practice to limit TDS to 2500 ppm, High Efficiency Mist Eliminator

DETERMINATIONS

1. In relation to the above equipment and the evaluation outlined in the Technical Support Document associated with this Order, the Department of Ecology, State of Washington, pursuant to RCW 70.94.152, WAC 173-400-110, and WAC 173-460-040, makes the following determinations:

1. The proposed modifications and changes, if operated as herein required, will be in accordance with applicable rules and regulations, as set forth in Chapter 173-400 WAC and 173-460 WAC and the operation thereof, at the location proposed, will not result in ambient air quality standards being exceeded.
2. The proposed modifications and changes, if operated as herein required, will provide all known, available, and reasonable methods of emission control.

THEREFORE, IT IS ORDERED that the project as described in the Notice of Construction application and more specifically detailed in plans, specifications, and other information submitted to Ecology is approved for construction and operation, provided the following conditions are satisfied:

APPROVAL CONDITIONS

1. ADMINISTRATIVE CONDITIONS:

~~a.~~**1.1** The following Orders are rescinded and replaced by the evaluation and conditions of approval of this consolidated Approval Order upon its issuance: Approval Order No. 07AQ-E223 and its Amendment #1.

~~b.~~**1.2** Within 180 days of issuance of this Approval, REC shall provide Ecology a comprehensive list of Air Pollution Control Equipment and Emergency Engine's Make, Model, and Serial Number. Emergency engine certifications to EPA standards shall be attached, specific for the engines installed since 2006 (includes fire suppression pump engines).

2. FACILITY-WIDE REQUIREMENTS:

2.1 In the event of a process or control device upset or malfunction that results in a release of an air contaminant (as defined in WAC 173-400-030(3)), REC shall notify Ecology Eastern Region by telephone (509-329-3400) within two (2) hours, identifying the equipment involved in the incident and the pollutant(s) released. The telephone notification shall be followed within 5 business days by a written report that includes an assessment of the amount and type of emissions resulting from the incident, the duration of the release, REC's understanding of the cause of the incident, and corrective actions taken or proposed. Each event that results in emissions of an air contaminant shall be fully documented by REC as described above, and in addition the emissions shall be included in the annual emission inventory report.

~~a. In the event of a process or control device upset or malfunction that results in excess emissions, REC shall notify Ecology Eastern Region by telephone (509-329-3400) immediately. The telephone notification shall be followed within 5 business days by a written report that includes an assessment of the amount and type of emissions resulting from the incident, the duration of the release, REC's understanding of the cause of the incident, and corrective actions taken or proposed. Each event that results in excess emissions shall be fully documented by REC as described above, and in addition submitted along with the annual emission inventory report.~~

~~b. Excess emissions are defined as, and include but are not restricted to, any criteria or toxic air pollutant emissions that are released from any emission unit or from the failure of~~

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~~any plant component at a rate or concentration above the emission factors approved by Ecology for reporting under Condition 23 of this determination.~~

~~c.~~**2.2** In the event of a control device upset or malfunction, the process equipment controlled by that device shall be shut-down as soon as safely possible and shall not be returned to service before the control device is functioning properly. ~~Excess~~ E~~e~~missions of any air contaminant resulting from the shut-down of any equipment, or the venting of any substance from any equipment during an emergency upset or other procedure not documented by this approval order or the NOC applications on which this Order is based, shall be documented as ~~an excess emission as~~ described above (Condition 2.1) regardless of the emission rate or concentration of the release.

2.3 All silane emissions released from process or control equipment or as a ~~excess emission~~release of an air contaminant as described in Conditions 2.1 or 2.2 ~~as defined above~~ shall be considered ~~as~~ to be particulate matter with an aerodynamic diameter of less than 2.5 micrometers, and also to be silane gas for the purposes of emission estimation~~.~~.

~~d.~~**2.4** Within 180 days of issuance of this Approval Order, REC shall provide Ecology a monitoring plan to document use of and emissions from any equipment declared 'insignificant' in the Plant 4 application materials,specifically including, but not limited to equipment with ID numbers A1c, A11d, A16, A21, A22, A25, B15, B16, B17, and C17. Each device shall be evaluated and a plan to monitor its emissions submitted for Ecology's review and approval. In no case shall the equipment identified above be operable for a period exceeding one calendar year from the date of issuance of this Approval Order without an Ecology-approved monitoring plan.

~~e.~~**2.5** The facility shall comply with all applicable requirements of 40 CFR 68: Chemical Accident Prevention Provisions.

3. PROCESS LIMITATIONS-Facility

~~a.~~**3.1** Opacity (excluding that demonstrated by the permittee to be caused by uncombined water vapor) from any uncontrolled vent shall not exceed ten percent for more than six minutes in any hour, measured in accordance with EPA Method 9.

~~b.~~**3.2** The total Metallurgical Grade Silicon (MGS) raw material received by this facility shall not exceed 52,040,000 pounds in any 12 month period. This facility total value shall be determined from inventory and purchase records and shall be calculated as a rolling 12 month total on at least a monthly frequency. Records shall be kept in accordance with Condition 22, and provided to Ecology in the annual emission inventory required in Condition 23, " Reporting".

~~**c.** The throughput rate of material processed in the East side finishing room shall not exceed 792,000 lbs/yr. This value shall be determined from inventory records on the exchange of these materials with the SGS Butte, Montana Facility.~~

~~**d.** The throughput rate of material processed in the West side finishing room is limited to 275,625 lbs. lathed in any 12 month period and 3,307,500 lb finished with grinders in any 12 month period. These values shall be determined from inventory records on the exchange of these materials with the SGS Butte, Montana Facility.~~

~~**e.** The throughput rate of material processed in the acid etching systems is limited to a surface area etched of 11,678 M^2/12 month period. This value shall be determined by~~

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~~calculating the surface area of the rods requiring the acid etching procedure from the inventory records of the exchange of these materials with the SGS Butte, Montana facility.~~

~~f.~~3.3 All diesel fuel delivered to this facility shall be 'ultra-low sulfur' (less than 15 ppmw sulfur). Copies of the diesel sulfur content certifications for each delivery to this facility shall be maintained on-site for a period of time no less than 60 months and shall be provided to Ecology on request.

4. 'Plant 1' Siemens Reactor-Section Filters

~~a.~~4.1 Siemens (Existing) Side Filters (Fabric, Cartridge, and Degasser): A1a, A1b, A1d, A13, and ~~A32~~ A33b (Torit Cartridge)

~~i.~~4.1.1 The concentration of PM_{10} emitted by fabric filters designated A1a, A1b, A1d, A13, and ~~A32~~ A33b shall not exceed 0.005 gr/dscf, measured in accordance with EPA Method 5/202.

~~ii.~~4.1.2 Baghouse A1a shall not exceed a PM_{10} Mass Emission rate of 0.015 tons per year.

~~iii.~~4.1.3 Baghouse A1b shall not exceed a PM_{10} Mass Emission rate of 0.0015 tons per year.

~~iv.~~4.1.4 Baghouse A1d shall not exceed a PM_{10} Mass Emission rate of 0.002 tons per year.

~~v.~~4.1.5 Baghouse A13 shall not exceed a PM_{10} Mass Emission rate of 0.01 tons per year.

~~vi.~~4.1.6 Baghouse ~~A32~~ A33b (the Torit Cartridge Filter) shall not exceed a PM_{10} Mass Emission rate of 0. 1 tons per year.

~~vii.~~4.1.7 The opacity of emissions from Fabric (and Cartridge) Filters designated A1a, A1b, A1d, A13, and ~~A32~~ A33b shall not exceed 5% for more than 6 minutes in any hour, measured in accordance with EPA Method 9.

~~b.~~4.2 No later than one calendar from the date of issuance of this Approval Order, ~~June 26, 2009,~~ filters A1a, A1b, A1d, A13, and ~~A32~~ A33b shall be equipped with filter failure instrumentation.

~~c.~~4.3 Stack Testing Requirements

~~i.~~4.3.1 Compliance with Conditions 4.1.1 through 4.1.7 shall be demonstrated by stack sampling within 180 days of issuance of this Approval Order in accordance with Condition 18.2.~~2~~3, or by submittal for Ecology review, within ~~90~~ 180 days of issuance of this ~~PD~~ Approval Order of vendor documentation that demonstrates each filter system satisfies conditions 4.1.1 through 4.1.7. Following this initial demonstration, ongoing compliance with Conditions 4.1.1 through 4.1.7 shall be documented by monthly plant surveys using reference Method 22 in accordance with Condition 18.2.8. The presence of visible emissions from a filtration system at the facility shall trigger a Method 9 reading followed by corrective measures if an exceedance of the opacity limit for a device is noted. Corrective measures shall be defined in the facility operations and maintenance manual required in Condition 21 of this approval order. Records shall be maintained in accordance with Condition 22 of this Order and shall document the opacity observations during each survey. Any Method 9 survey resulting in corrective measures shall be reported to Ecology as a violation of a condition of this Approval Order no later than the end of the following business day.

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5. **Plant 3 and Plant 4 (FBR and Silane Gas Section) Side Fabric Filters**: B-2, B-3, B-4, B-1, C-1, C-2, C-3, C-4, C-36 A, B, and C-37 A-F:

~~a.~~**5.1** The concentration of PM_{10} emitted by fabric filters B-2, B-3, B-4, B-1, C-1, C-2, C-3, C-4, C-36 A, B, and C-37 A-F shall not exceed 0.005 gr/dscf, measured in accordance with EPA Method 5/202.

~~b.~~**5.2** Baghouse B-2 shall not exceed a PM_{10} Mass Emission rate of 0.05 lb/hr or 0.21 tons per year.

~~c.~~**5.3** Baghouse B-3 shall not exceed a PM_{10} Mass Emission rate of 0.009 lb/hr or 0.04 tons per year.

~~d.~~**5.4** Baghouse B-4 shall not exceed a PM_{10} Mass Emission rate of 0.009 lb/hr or 0.04 tons per year.

~~e.~~**5.5** Baghouse B-1 shall not exceed a PM_{10} Mass Emission rate of 0.004 lb/hr or 0.02 tons per year.

~~f.~~**5.6** Baghouse C-1shall not exceed a PM_{10} Mass Emission rate of 0.004 lb/hr or 0.02 tons per year.

~~g.~~**5.7** Baghouse C-2 shall not exceed a PM_{10} Mass Emission rate of 0.~~044~~ 047 lb/hr or 0.2 tons per year

~~h.~~**5.8** Baghouse C-3 shall not exceed a PM_{10} Mass Emission rate of 0.~~008~~ 009 lb/hr or 0.04 tons per year.

~~i.~~**5.9** Baghouse C-4 shall not exceed a PM_{10} Mass Emission rate of 0.~~008~~ 009 lb/hr or 0.04 tons per year.

~~j.~~**5.10** Baghouse C-36 A shall not exceed a PM_{10} Mass Emission rate of 0.004 lb/hr.

~~k.~~**5.11** Baghouse C-36 B shall not exceed a PM_{10} Mass Emission rate of 0.004 lb/hr.

~~l.~~**5.12** Baghouses C-37 A, B, C, D, E, and F, each, shall not exceed a PM_{10} Mass Emission rate of 0.004 lb/hr.

~~m.~~**5.13** The opacity of emissions from Filters designated B-2, B-3, B-4, B-1, C-1, C-2, C-3, C-4, C-36 A, B, and C-37 A-F shall not exceed 5% for more than 6 minutes in any hour, measured in accordance with EPA Method 9.

~~i.~~**5.13.1** All Plant 3 and Plant 4 Fabric and Cartridge Filters ("Baghouses") shall be equipped with filter failure alarm instrumentation. Upon filter failure, the instrumentation shall send a visible and/or audible alarm to a location routinely occupied by operators of that equipment (e.g. the control room).

~~n.~~**5.14** Stack Testing Requirements

5.14.1 Compliance with Conditions 5.1 through 5.13 shall be demonstrated by stack sampling within 180 days of issuance of this Approval Order in accordance with Condition 18.2.~~2~~3, or by submittal for Ecology review, within ~~90~~ 180 days of issuance of this ~~PD~~ Approval Order of vendor documentation that demonstrates each filter system satisfies conditions 5.1 through 5.13. Following this initial demonstration, ongoing compliance with Conditions 5.1 through 5.13 shall be documented by monthly plant surveys using reference Method 22 in accordance with Condition 18.2.8. The presence of visible emissions from a filtration system at the facility shall trigger a Method 9 reading followed by corrective measures if an exceedance of the opacity limit for a device is noted. Corrective measures shall be defined in the facility operations and maintenance manual required in Condition 21 of this approval order. Records shall be maintained in accordance with

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Condition 22 of this Order and shall document the opacity observations during each survey. Any Method 9 survey resulting in corrective measures shall be reported to Ecology as a violation of a condition of this Approval Order no later than the end of the following business day.

~~i. The presence of visible emissions from a filtration system at the facility shall trigger corrective measures defined in the facility operations and maintenance manual required in Condition 21 of this approval order. Records shall be maintained in accordance with Condition 22 of this Order and shall document the opacity observations during each survey.~~

6. Hydrogenation Columns (All)

~~a.~~ 6.1 Plant 1, Plant 3, and Plant 4: Silicon tetrachloride or trichloride receiving, storage, and reactor feed piping and pump components shall be monitored for leaks as described in Approval Condition ~~18~~ 19 of this Order.

~~b.~~ 6.2 Plant 1, Plant 3, and Plant 4: SMR Hydrogen Production

~~i.~~ 6.2.1 No use of hydrogen produced by SMR systems is allowed as fuel in any combustion device at this facility.

~~ii.~~ 6.2.2 The NOx concentration of the SMR exhausts designated B-11and C-11 shall not exceed 76 ppmvd NOx at 3% O2, nor a mass emission level of 1.22 lb/hr at each stack.

~~iii.~~ 6.2.3 The CO concentration of the SMR exhausts designated B-11 and C-11 shall not exceed 30 ppmvd at 3% O2, nor a mass emission rate of 0.57 lb/hr at each stack.

~~iv.~~ 6.2.4 Visible emissions of the SMR exhausts designated B-11 and C-11 shall not exceed 5% Opacity for more than 6 minutes in any hour.

~~v.~~ 6.2.5 The CO concentration of the SMR deaerator exhausts designated B-12 and C-12 shall not exceed 100 ppmvd at 3%O2, nor a mass emission rate of 0.034 lb/hr, each.

~~vi.~~ 6.2.6 The visible emissions of the SMR deaerator exhausts designated B-12 and C-12 shall not exceed 5% Opacity for more than 6 minutes in any hour.

~~vii.~~ 6.2.7 Stack Sampling Requirement

~~1.~~ 6.2.7.1 Within 180 days of ~~the~~ each SMR system~~s~~ becoming operational, the SMR exhausts designated B-11 and C-11shall be tested for NOx and CO in accordance with testing Conditions 18.2.4 and 18.2.5 of this Approval Order.

~~2.~~ 6.2.7.2 Within 180 days of the SMR systems becoming operational, the SMR exhausts designated B-12 and C-12 shall be tested for CO in accordance with testing Condition 18.2.5 of this Approval Order.

~~3.~~ 6.2.7.3 Following the initial stack sampling of B-11 and C-11, the stack sampling for CO and NOx shall be repeated once every 12 months until 3 consecutive tests demonstrate satisfication of the limits in conditions 6.2.2 through 6.2.4. Following that demonstration the frequency of stack sampling shall be no less frequent than once every 5 calendar years.

~~4.~~ 6.2.7.4 Following the initial stack sampling of B-12 and C-12, ~~the~~ stack sampling for CO shall be repeated ~~once every 12 months until 3 consecutive tests demonstrate satisfication of the limits in conditions 6.2.5 and 6.2.6. Following that demonstration the frequency of stack sampling shall be no less frequent~~

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~~than once every 5 calendar years~~at Ecology's discretion per WAC 173-400-105(4).

~~c.~~6.3 SMR Cooling Towers – Unifield Engineering AV66003 (Equipment ID B-26, C-26)

~~i.~~6.3.1 The cooling towers shall not exceed a drift rate of 0.0020 % of the water circulation rate.

6.3.2 The cooling towers shall be designed for a maximum water circulation rate of 2000 gallons per minute.

~~ii.~~6.3.3 The water discharged from the cooling tower shall not exceed 2500 ppmw TDS monitored in accordance with the current Federal or State discharge permit(s).

~~iii.~~6.3.4 Any amendments to the water in the cooling tower (biocides, disinfectants, etc.) shall contain no HAPs listed in Section 112(b)(1) of the 1990 Amendments to the Clean Air Act and no TAPs listed in WAC 173-460.

7. Distillation Sections

~~a.~~7.1 **'Plant 1' Siemens Side:** A30, A31-Hot Oil Heaters – 2 @ 25 mmBTU/hr

~~i.~~7.1.1 The hot oil heaters designated A30 and A31 are limited to exclusive use of natural gas fuel, and shall have non-resettable totalizing fuel meters installed on each.

~~ii.~~7.1.2 The hot oil heaters designated A30 and A31 shall not exceed an exhaust concentration of NOx of 30 ppmv @7% O2, nor a mass emission rate of 0.59 lb/hr from each stack.

~~iii.~~7.1.3 The hot oil heaters designated A30 and A31 shall not exceed an exhaust concentration of CO of 50 ppmv @7%O2, nor a mass emission rate of 0.60 lb/hr from each stack.

~~iv.~~7.1.4 Visible emissions in the exhaust of the hot oil heaters designated A30 and A31 shall not exceed an opacity of 10% for more than 6 minutes in any hour.

~~v.~~7.1.5 Stack Sampling Requirement

~~1.~~7.1.5.1 To determine initial compliance with Conditions 7.1.2 through7.1.4, within 180 days of issuance of this Approval Order the Hot Oil Heater exhausts designated A-30 and A-31shall be tested for NOx and CO in accordance with testing Conditions 18.2.4 and 18.2.5 of this Approval Order.

~~2.~~7.1.5.2 Following the initial stack sampling of the A30 and A-31 hot oil heater exhausts, a periodic testing schedule will be determined by Ecology in accordance with WAC 173-400-105(4).

~~vi.~~7.1.6 **Plant 3 Hot Oil Heaters**: B-23, B-24, and B-25 Hot Oil Heaters – 3@ 56 mmBTU/hr when firing natural gas

~~vii.~~7.1.7 The hot oil heaters designated B-23, B-24, and B-25 shall be fueled exclusively with natural gas and shall be equipped with non-resettable totalizing fuel meters.

~~viii.~~7.1.8 The hot oil heaters designated B-23, B-24, and B-25 shall not exceed an exhaust NOx concentration of 20 ppmv @ 3% O2, nor a NOx mass emission rate of 1.31 lb/hr from each stack.

~~ix.~~7.1.9 The hot oil heaters designated B-23, B-24, and B-25 shall not exceed an exhaust CO concentration of 30 ppmv @ 3% O2, nor a CO mass emission rate of 1.2 lb/hr from each stack.

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~~x.~~7.1.10 The opacity of visible emissions from the hot oil heaters designated B-23, B-24, and B-25 shall not exceed 5% for more than 6 minutes in any hour.

~~xi.~~7.1.11 Retrofit Requirement: Within 365 days of issuance of this Approval Order, the Hot Oil Heaters designated B23, B24 and B25shall be retrofit with equipment that results in exhaust concentrations of NOx of 9 ppmv @ 3% O2 and a NOx mass emission rate of 0.59 pounds per hour.

~~xii.~~7.1.12 Stack Sampling Requirement

~~1.~~7.1.12.1 Within 545 days of issuance of this Approval Order, one of the three B-side hot oil heaters shall be tested for NOx and CO in accordance with testing Conditions 18.2.4 and 18.2.5 of this Approval Order. The heater shall be tested while firing the maximum anticipated natural gas input rate (90% or greater of the rated fuel input capacity).

~~2.~~7.1.12.2 Following the initial stack sampling of the hot oil heater exhausts, a periodic testing schedule will be determined by Ecology in accordance with WAC 173-400-105(4).

~~b.~~7.2 **Plant 4 Hot Oil Heaters**: C-23,C-24, and C-25 Hot Oil Heaters – 3@ 56 mmBTU/hr when firing natural gas.

~~i.~~7.2.1 The hot oil heaters designated C-23, C-24, and C-25 shall be fueled exclusively with natural gas and shall be equipped with non-resettable totalizing fuel meters.

~~ii.~~7.2.2 The hot oil heaters designated C-23, C-24, and C-25 shall not exceed an exhaust NOx concentration of 9 ppmv @ 3% O2, nor a NOx mass emission rate of 0.59 lb/hr from each stack.

~~iii.~~7.2.3 The hot oil heaters designated C-23, C-24, and C-25 shall not exceed an exhaust CO concentration of 30 ppmv @ 3% O2, nor a CO mass emission rate of 1.2 lb/hr from each stack.

~~iv.~~7.2.4 The opacity of visible emissions from the hot oil heaters designated C-23, C-24, and C-25 shall not exceed 5% for more than 6 minutes in any hour.

~~v.~~7.2.5 Stack Sampling Requirement

~~1.~~7.2.5.1 Within 180 days of commissioning of the C-23, C-24, and C-25, one of the Plant 4 hot oil heaters shall be tested for NOx and CO in accordance with testing Conditions 18.2.4 and 18.2.5 of this Approval Order. The heaters shall be tested while firing the maximum anticipated natural gas input (90 % or greater of the rated fuel input rate).

~~2.~~7.2.5.2 Following the initial stack sampling of the hot oil heater exhausts, a periodic testing schedule will be determined by Ecology in accordance with WAC 173-400-105(4).

~~c.~~7.3 **Plants 1,3 and 4:** Flamer/Baghouse Exhaust A-36

~~i.~~7.3.1 The exhaust (stack A-36) from the baghouse shall not exceed a PM10 concentration of 0.005 gr/dscf.

~~ii.~~7.3.2 The mass emission rate of PM10 from stack A-36 shall not exceed 0.44 lb/hr, or a rolling 12 month total of 1.88 tons per year.

~~iii.~~7.3.3 Visible emissions in the exhaust from the flamer/baghouse shall not exceed an opacity of 5% for more than 6 minutes in any hour.

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~~iv.~~7.3.4 Not later than ~~June 26, 2009~~one calendar year after the date of issuance of this Approval Order, the filter designated A-36 shall be equipped with filter failure instrumentation. Upon filter failure, the instrumentation shall send a visible and/or audible alarm to a location routinely occupied by operators of that equipment (e.g. the control room).

~~v.~~7.3.5 Stack Sampling Requirement

~~1.~~7.3.5.1 Within 180 days of commissioning of any Plant 3 vents routed to the flamer/baghouse, and again within 180 days of start-up of Plant 4, the exhaust designated A-36 shall be tested for PM-10 and opacity in accordance with testing Conditions 18.2.3 and 18.2.1 of this Approval Order.

7.3.6 Following the initial stack sampling of the stack A-36 exhaust, ongoing compliance with Conditions 7.3.1 through 7.3.4 shall be documented by monthly plant surveys using reference Method 22 in accordance with Condition 18.2.8. The presence of visible emissions from a filtration system at the facility shall trigger a Method 9 reading followed by corrective measures if an exceedance of the opacity limit for a device is noted. Corrective measures shall be defined in the facility operations and maintenance manual required in Condition 21 of this approval order. Records shall be maintained in accordance with Condition 22 of this Order and shall document the opacity observations during each survey. Any Method 9 survey resulting in corrective measures shall be reported to Ecology as a violation of a condition of this Approval Order no later than the end of the following business day.

~~vi. The presence of visible emissions from a filtration system at the facility shall trigger corrective measures defined in the facility operations and maintenance manual required in Condition 21 of this approval order. Records shall be maintained in accordance with Condition 22 of this Order and shall document the opacity observations during each survey.~~

~~d.~~7.4 Plant 1, Plant 3, and Plant 4: Positive Pressure Piping, Pumps

~~i.~~7.4.1 The leak detection and repair program described in Approval Condition 19 of this Order shall be implemented for piping components of the hydrogenation and distillation and reactor areas of this facility.

~~e.~~

~~f.~~7.5 -B-19 Maintenance Scrubber System

~~i. Operation of the Maintenance Scrubbing System designated B-19 shall not exceed 840 hours per year operation.~~

~~ii.~~7.5.1 The Maintenance Scrubbing System designated B-19 shall not exceed an exhaust PM10 concentration of 0.02 gr/dscf.

~~iii.~~7.5.2 The Maintenance Scrubbing System designated B-19 shall not exceed an exhaust PM10 mass emission ~~rate~~ r13 of 0.06 lb/hr.

~~iv.~~7.5.3 The Maintenance Scrubbing System designated B-19 shall not exceed an exhaust HCl concentration of 12 ppmvd.

7.5.4 The Maintenance Scrubbing System designated B-19 shall not exceed an exhaust HCl mass emission rate of 0.024 lb/hr.

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~~v.~~7.5.5 The opacity of emissions from the stack designated B-19 shall not exceed 5% for more than 6 minutes in any hour, measured in accordance with EPA Method 9.

~~vi.~~7.5.6 Monitoring: Vent gas flow to the scrubber designated B-19 shall be monitored in all conditions of its operation. The flow monitored shall include estimates of the volume and duration at that volume. A written description of the monitoring procedure (instrumental or manual) shall be submitted to Ecology for approval within 180 days of commissioning of scrubber B-19.

~~vii.~~7.5.7 Stack Sampling Requirement

7.5.7.1 Within 180 days of commissioning of the maintenance scrubber B-19, the exhaust of the scrubber designated B-19 shall be tested for PM10 and HCl to determine initial compliance with conditions 7.5.~~2~~ 1 through 7.5.5.

~~1.~~7.5.7.2 During the first calendar year following issuance of this Approval Order, the B-19 scrubber exhaust shall be tested for PM10 and HCl during a "turnaround event" to determine compliance with Conditions 7.5.1 through 7.5.5.

~~2.~~7.5.7.3 Following the initial stack sampling of the stack B-19 ~~inlet and~~ exhaust, the testing described in 7.5.~~7~~6.1 and 7.5.6.2 shall be repeated every 12 months until stack B-19 has been tested 3 times. Following the first 3 tests, the frequency of regularly scheduled sampling will be determined by Ecology in accordance with WAC 173-400-105(4). A maximum period between third party emission testing of stack B-19 is 5 calendar years unless otherwise approved in writing by Ecology.

~~viii. The permittee shall maintain records of the length of time of any use of the B-19 scrubber (monitored in accordance with Condition 7.5.6). The records shall be maintained in accordance with Condition 22 of this Order.~~

~~g.~~7.6 Process Scrubbing Systems (B-18)

~~i.~~7.6.1 The Process Scrubbing System designated B-18 shall not exceed an exhaust PM10 concentration of 0.02 grains per dry standard cubic foot (gr/dscf).

~~ii.~~7.6.2 The Process Scrubbing System designated B-18 shall not exceed an exhaust PM10 mass emission rate of 0.~~06~~ 13 lb/hr.

~~iii.~~7.6.3 The Process Scrubbing System designated B-18 shall not exceed an exhaust HCl concentration of 12 ppmvd.

~~iv.~~7.6.4 The Process Scrubbing System designated B-18 shall not exceed an exhaust HCl mass emission rate of 0.024 lb/hr ~~during 'normal' operation~~.

7.6.5 Monitoring: Vent gas flow to the scrubber designated B-18 shall be monitored in all conditions of its operation. The flow monitored shall include estimates of the volume and duration at that volume. A written description of the monitoring procedure (instrumental or manual) shall be submitted to Ecology for approval within 180 days of commissioning of scrubber B-18.

7.6.6 The opacity of emissions from the stack designated B-18 shall not exceed 5% for more than 6 minutes in any hour, measured in accordance with EPA Method 9. ~~1.1.1~~

~~v.~~7.6.7 Stack Sampling Requirement

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7.6.7.1 Within 180 days of commissioning of the Scrubber designated B-18, the exhaust of the scrubber designated B-18 shall be tested for PM10 and HCl, to determine compliance with Conditions 7.6.1 through 7.6.46. of this Order. During the stack sampling, the exhaust opacity shall be determined in accordance with testing Condition 18.2.1 of this Approval Order.

7.6.7.2 During the first calendar year following issuance of this Approval Order, the B-18 scrubber exhaust shall be tested for PM10 and HCl during a "turnaround event" to determine compliance with Conditions 7.6.1 through 7.6.6 ~~1.1.1.1~~

~~1.~~7.6.7.3 Following the initial stack sampling of the stack B-18 exhaust, the testing described in 7.6.~~6~~7.1 and 7.6.7.2 shall be repeated every 12 months until stack B-18 has been tested 3 times. Following the first 3 tests, the frequency of regularly scheduled sampling will be determined by Ecology in accordance with WAC 173-400-105(4). A maximum period between third party emission testing of stack B-18 is 5 calendar years unless otherwise approved in writing by Ecology.

~~vi. The permittee shall maintain records of the length of time of any use (monitored in accordance with Condition 7.6.5) of the B-18 scrubber. The records shall be maintained in accordance with Condition 22 of this Order.~~

8. Silane Storage and Loading

~~a.~~8.1 The leak detection and repair program outlined in Approval Condition 19 of this Order shall be implemented for the silane compression, storage, and loading processes at this facility.

~~b.~~8.2 C-20 Silane Loading Scrubber

~~i.~~8.2.1 The silane loading scrubber exhaust designated C-20 shall not exceed a PM10 mass emission rate of 0.05 lb/hr, nor a PM10 concentration of 0.02 gr/dscf.

8.2.2 The silane loading scrubber designated C-20 shall not exceed a silane mass emission rate of 0.03 lb/hr.

8.2.3 The opacity of emissions from the stack designated C-20 shall not exceed 5% for more than 6 minutes in any hour, measured in accordance with EPA Method 9.

~~ii.~~8.2.4

~~iii.~~8.2.5 Stack Sampling Requirement

~~1.~~8.2.5.1 Within 180 days of commissioning of the Scrubber designated C-20, the exhaust of the Scrubber designated C-20 shall be tested to determine compliance with Conditions 8.2.1 ~~and~~ through 8.2.~~2~~3. Following the initial test, the frequency of regularly scheduled sampling will be determined by Ecology in accordance with WAC 173-400-105(4). A maximum period between third party emission testing of stack C-20 is 5 calendar years unless otherwise approved in writing by Ecology.

9. Polysilicon Reactor Systems

~~a.~~9.1 Siemens Side: 1-TDF C, 49 TDF G, 14 TDF H, 6 TDF J Reactors

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~~i.~~9.1.1 The permittee shall reduce silane emissions from the Siemens-style reactors by conducting a 10-Minute Burn-off each time each reactor is opened. The burn-off is a period during which no feed silane is introduced while reactor power is maintained at maximum levels.

~~ii.~~9.1.2 A-14 Stack (used during periods of maintenance turnaround and malfunction or upset events)

~~1.~~9.1.2.1 The opacity of emissions from the uncontrolled venting from the stack designated A-14 shall not exceed 10% for more than 6 minutes in any hour, measured in accordance with Approval Condition 17 of this Order.

~~2.~~9.1.2.2 The vent stack designated A-14 shall not exceed a PM10 exhaust concentration of 0.10 gr/dscf.

~~3.~~9.1.2.3 Use of the A-14 Stack shall not exceed 480 hours in any 12 month period.

~~4.~~9.1.2.4 Monitoring: Vent gas flow to the vent designated A-14 shall be monitored in all conditions of its operation. The flow monitored shall include estimates of the volume and duration at that volume. A written description of the monitoring procedure (instrumental or manual) shall be submitted to Ecology for approval within 180 days of commissioning of the Plant 3 silane production equipment.

~~iii.~~9.1.3 The permittee shall maintain records of the length of time of any use of the A-14 stack (monitored in accordance with Condition 9.1.2.4). The records shall be maintained in accordance with Condition 22 of this Order.

~~b.~~9.2 Plant 3:

~~i.~~9.2.1 B-7 Sintered Metal Filter

~~1.~~9.2.1.1 The Sintered Metal Filter designated B-7 shall not exceed a PM10 exhaust concentration of 0.005 gr/dscf.

~~2.~~9.2.1.2 The Sintered Metal Filter designated B-7 shall not exceed a PM_{10} Mass Emission rate of 0.04 tons per year.

~~3.~~9.2.1.3 The opacity of emissions from the filter designated B-7 shall not exceed 5% for more than 6 minutes in any hour, measured in accordance with EPA Method 9.

~~4.~~9.2.1.4 The sintered metal filter designated B-7 shall be equipped with filter failure instrumentation. Upon filter failure, the instrumentation shall send a visible and/or audible alarm to a location routinely occupied by operators of that equipment (e.g. the control room).

~~ii.~~9.2.2 B-13 Wet Vacuum Blower Scrubber Fabric Filter

~~1.~~9.2.2.1 The concentration of PM_{10} emitted by the fabric filter designated B-13 shall not exceed 0.005 gr/dscf, measured in accordance with Approval Condition 18.2.3 of this Order.

~~2.~~9.2.2.2 The Fabric Filter designated B-13 shall not exceed a PM_{10} mass emission rate of 0.05 tons per year.

~~3.~~9.2.2.3 The opacity of emissions from the Fabric Filter designated B-13 shall not exceed 5% for more than 6 minutes in any hour, measured in accordance with Approval Condition ~~17~~ 18.2.1 of this Order.

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~~4.~~9.2.2.4 The Fabric Filter designated B-13 shall be equipped with filter failure alarm instrumentation. Upon filter failure, the instrumentation shall send a visible and/or audible alarm to a location routinely occupied by operators of that equipment (e.g. the control room).

~~iii.~~9.2.3 Stack Sampling Requirement

9.2.3.1 Compliance with Conditions 9.2.2.1 through 9.2.2.3 shall be demonstrated by stack sampling in accordance with Conditions 18.2.1 and 18.2.3, or by submittal for Ecology review, within 90 days of issuance of this PD of vendor documentation that demonstrates the filter system satisfies conditions 9.2.2.1 through 9.2.2.3. Following this initial demonstration, ongoing compliance with Conditions 9.2.2.1 through 9.2.2.3 shall be documented by monthly plant surveys using reference Method 22 in accordance with Condition 18.2.8. The presence of visible emissions from a filtration system at the facility shall trigger a Method 9 reading followed by corrective measures if an exceedance of the opacity limit for a device is noted. Corrective measures shall be defined in the facility operations and maintenance manual required in Condition 21 of this approval order. Records shall be maintained in accordance with Condition 22 of this Order and shall document the opacity observations during each survey. Any Method 9 survey resulting in corrective measures shall be reported to Ecology as a violation of a condition of this Approval Order no later than the end of the following business day.

~~iv. The presence of visible emissions from a filtration system at the facility shall trigger corrective measures defined in the facility operations and maintenance manual required in Condition 21 of this approval order. Records shall be maintained in accordance with Condition 22 of this Order and shall document the opacity observations during each survey.~~

~~v.~~9.2.4 B-14 FBR Process Vent Stack

~~1.~~9.2.4.1 The sintered metal filter controlling emissions from the stack designated B-14 shall not exceed a PM10 exhaust concentration of 0.005 gr/dscf.

~~2.~~9.2.4.2 The uncontrolled venting (including pass-through silane gas) from the stack designated B-14 shall not exceed a PM_{10} mass emission rate of 1.84 lb/hr.

~~3.~~9.2.4.3 The opacity of emissions from the stack designated B-14 shall not exceed ~~10~~5% for more than 6 minutes in any hour, measured in accordance with EPA Method 9.

~~4.~~9.2.4.4 Monitoring: Vent gas flow to the vent designated B-14 shall be monitored in all conditions of its operation. The flow monitored shall include estimates of the volume and duration at that volume. A written description of the monitoring procedure (instrumental or manual) shall be submitted to Ecology for approval within 180 days of commissioning of the first set of FBRs installed at the facility.

~~5.~~9.2.4.5 Records shall be maintained of the occurrence and duration of any use of the stack designated B-14. These records shall be provided to Ecology on request.

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~~6.~~9.2.4.6 Stack Sampling Requirement

~~a.~~9.2.4.6.1 Within 180 days of commissioning of the equipment venting through the stack designated B-14, B-14 shall be tested to determine PM-10 emissions in accordance with Condition 18.2.3 of this Approval Order. During the stack sampling, the exhaust opacity shall be determined in accordance with testing Condition 18.2.1 of this Approval Order.

~~b.~~9.2.4.6.2 Following the initial stack sampling of the stack B-14 exhaust, the frequency of regularly scheduled sampling will be determined by Ecology in accordance with WAC 173-400-105(4). The maximum period between third party emission testing of stack B-14 is 5 calendar years unless otherwise approved in writing by Ecology.

~~vi.~~9.2.5 B-20 Filter Powder Wetting Scrubber

~~1.~~9.2.5.1 The concentration of PM10 in the exhaust from the scrubber designated B-20 shall not exceed 0.02 gr/dscf.

~~2.~~9.2.5.2 The exhaust of the B-20 scrubber system shall not exceed a PM10 mass emission rate of 0.03 lb/hr on a 24-hour average basis.

~~3.~~9.2.5.3 Visible emissions from the stack of the scrubber designated B-20 shall not exceed an opacity of 5% for more than 6 minutes in any hour.

~~4.~~9.2.5.4 Stack Sampling Requirement

~~a.~~9.2.5.4.1 Within 180 days of commissioning of the filter powder wetting system, the stack designated B-20 shall be tested to determine PM-10 mass emissions and concentration in accordance with Condition 18..2.3 of this Approval Order. During the stack sampling, the exhaust opacity shall be determined in accordance with testing Condition 18.2.1 of this Approval Order.

~~b.~~9.2.5.4.2 Following the initial stack sampling of the stack B-20 exhaust, the testing described in 9.2.~~6~~5.4.1 shall be repeated every 12 months until stack B-20 has been tested 3 times. Following the first 3 tests, the frequency of regularly scheduled sampling will be determined by Ecology in accordance with WAC 173-400-105(4). The maximum period between third party emission testing of stack B-18 is 5 calendar years unless otherwise approved in writing by Ecology.

~~vii.~~9.2.6 Demonstration FBR (Stack A-35)

~~1.~~9.2.6.1 The silane feed rate to the demonstration fluid bed reactor shall not exceed ~~39.67~~90 kg/hr.

~~2.~~9.2.6.2 The stack designated A-35 shall not exceed a PM10 exhaust concentration of 0.005 gr/dscf.

~~3.~~9.2.6.3 The leak detection and repair program described in Approval Condition 19 of this Order shall be implemented for piping components of the Demonstration reactor unit.

10. Plants 1,3 and 4: Refrigeration Systems B-21A (Silane Area), and B-21B (Polysilicon Area) and C-21 (Plant 4)

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~~i.~~**11.1.1** The leak detection program outlined in Approval Condition 19 of this Order shall be implemented for the refrigeration systems B-21A and B-21B and C-21.

11. Plants 1,3 and 4: Metal Chloride Dryer Systems:

~~a.~~**11.1** Dryer Scrubbers: B-10 and C-10

~~i.~~**11.1.1** The exhausts of the metal chloride dryer scrubbers designated B-10 and C-10 shall not exceed a PM10 concentration of 0.02 gr/dscf.

~~ii.~~**11.1.2** The exhaust of the metal chloride dryer scrubbers designated B-10 and C-10 shall not exceed a PM10 mass emission rate of 0.05 lb/hr.

~~iii.~~**11.1.3** The exhaust of the metal chloride dryer scrubbers designated B-10 and C-10 shall not exceed a HCl concentration of 8 ppmvd.

11.1.4 The exhaust of the metal chloride dryer scrubbers designated B-10 and C-10 shall not exceed a HCl mass emission rate of 0.012 lb/hr.

11.1.5 The opacity of emissions from the stacks designated B-10 and C-10 shall not exceed 5% for more than 6 minutes in any hour, measured in accordance with EPA Method 9.

~~**1.1.2**~~

~~1.1.2.1~~11.1.6 Within 180 days of commissioning of the metal chloride dryer systems, the exhaust of the scrubbers designated B-10 and C-10 shall be tested for PM-10 and HCl to determine compliance with Conditions 11.1.1 through 11.1.4. During the stack sampling, the exhaust opacity shall be determined in accordance with testing Condition 18.2.1 of this Approval Order.

~~1.~~**11.1.6.1** Following the initial stack sampling of the stacks B-10 and C-10 exhausts, the testing described in 11.1.~~4.1~~6 shall be repeated every 12 months until stacks B-10 and C-10 have been tested 3 times. Following the first 3 tests, the frequency of regularly scheduled sampling will be determined by Ecology in accordance with WAC 173-400-105(4). The maximum period between third party emission testing of stacks B-10 and C-10 is 5 calendar years unless otherwise approved in writing by Ecology.

~~b.~~**11.2** Neutralizing Solids Receiving and Handling

~~i.~~**11.2.1** B-9 and C-9 Trona Bin Vent Filters

~~ii.~~**11.2.2** The exhausts from baghouses B-9 and C-9 shall not exceed a PM_{10} exhaust concentration of 0.005 gr/dscf.

~~iii.~~**11.2.3** The exhausts from baghouses B-9 and C-9 shall not exceed a PM_{10} Mass Emission rate of 0.03 lb/hr nor 0.12 tons per year.

~~iv.~~**11.2.4** The opacity of visible emissions from the baghouses designated B-9 and C-9 shall not exceed 5% for more than 6 minutes in any hour.

~~1.~~**11.2.4.1** The Fabric Filters designated B-9 and C-9 shall be equipped with filter failure alarm instrumentation. Upon filter failure, the instrumentation shall send a visible and/or audible alarm to a location routinely occupied by operators of that equipment (e.g. the control room).

~~v.~~**11.2.5** Stack Testing Requirements

11.2.6 Compliance with Conditions 11.2.2 through 11.2.4 shall be demonstrated by stack sampling in accordance with Conditions 18.2.3 and 18.2.1 within 180 days of

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issuance of this Approval Order, or by submittal for Ecology review, within ~~90~~ 180 days of issuance of this ~~PD~~ Approval Order of vendor documentation that demonstrates the filter systems satisfy conditions 11.2.2 through 11.2.4. Following this initial demonstration, ongoing compliance with Conditions 11.2.2 through 11.2.4 shall be documented by monthly plant surveys using reference Method 22 in accordance with Condition 18.2.8. The presence of visible emissions from a filtration system at the facility shall trigger a Method 9 reading followed by corrective measures if an exceedance of the opacity limit for a device is noted. Corrective measures shall be defined in the facility operations and maintenance manual required in Condition 21 of this approval order. Records shall be maintained in accordance with Condition 22 of this Order and shall document the opacity observations during each survey. Any Method 9 survey resulting in corrective measures shall be reported to Ecology as a violation of a condition of this Approval Order no later than the end of the following business day.

~~vi. The presence of visible emissions from a filtration system at the facility shall trigger corrective measures defined in the facility operations and maintenance manual required in Condition 21 of this approval order. Records shall be maintained in accordance with Condition 22 of this Order and shall document the opacity observations during each survey.~~

12. Product Finishing A-32E and A-32W1 and A-32W2:

~~a.~~**12.1** The quantity of material processed in A-32E shall not exceed 792,000 lbs in any 12 month period (the limit in Approval Condition 2.4 of this Order).

~~b.~~**12.2** The quantity of material processed in A-32W1 shall not exceed 275,625 lbs lathed in any 12 month period and A-32W2 shall not exceed 3,307,500 lb finished with grinders in any 12 month period (the limits in Approval Condition 2.5 of this Order).

~~c.~~**12.3** The concentration of PM-10 shall not exceed 0.01 gr/dscf in any of the exhausts from finishing room control devices (A-32E, A-32W1, or A-32W2)

~~d.~~**12.4** The visible emissions of the exhausts from any of the exhausts from the finishing rooms (A-32E, A-32W1, or A-32W2) shall not exceed an opacity of 5% for 6 minutes in any hour.

~~e.~~**12.5** Regularly scheduled sampling of finishing room control devices equipped and operated according to the manufacturer's specifications is not required by this Approval Order. Ecology may require testing in the future in accordance with WAC 173-400-105(4).

~~i.~~**12.5.1** Records shall be maintained of the quantity of materials finished in each of the finishing operations. The records shall be maintained in accordance with Condition 22 of this Order.

13. A15 Acid Etch Scrubber

~~a.~~**13.1** The surface area of silicon rods processed in the acid etching system shall not exceed 11,678 m2/yr.

~~b.~~**13.2** The acid etching scrubber exhaust designated A-15 shall not exceed a nitric acid emission rate of 18.4 lb/week.

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~~c.~~**13.3** The acid etching vent designated A-15 shall not exceed a NOx mass emission rate of 0.63 lb/hr.

~~d.~~**13.4** Visible emissions from the acid etching scrubber exhaust shall not exceed an opacity of 10 % for more than 6 minutes in any hour.

~~e.~~**13.5** Stack Sampling Requirement:

~~i.~~**13.5.1** Within 180 days of issuance of this Order, the exhaust of the scrubber designated A-15 shall be tested for Nitric Acid and NOx to determine compliance with Conditions 13.2 through 13.4. During the stack sampling, the exhaust opacity shall be determined in accordance with testing Condition 18.2.1 of this Approval Order.

~~ii.~~**13.5.2** Following the initial stack sampling of the stack A-15 exhaust, the testing described in 13.5.1 shall be repeated every 12 months until stack A-15 has been tested 3 times. Following the first 3 tests, the frequency of regularly scheduled sampling will be determined by Ecology in accordance with WAC 173-400-105(4). A maximum period between third party emission testing of stack A-15 is 5 calendar years unless otherwise approved in writing by Ecology.

~~iii.~~**13.5.3** Records shall be maintained of the surface area of materials etched in the processes controlled by the A-15 scrubber. The records shall be maintained in accordance with Condition 22 of this Order.

14. Cooling Towers A12a, A12b, A12c, A12d

~~a.~~**14.1** The permittee shall use no water treatment chemicals for the cooling towers that contain hazardous air pollutants listed by EPA in the 1990 amendments to the Clean Air Act as amended, nor any toxic air pollutants (TAP) listed in WAC 173-460.

14.2 The water discharged from the cooling tower shall not exceed 2500 ppmw TDS monitored in accordance with the current Federal or State discharge permit(s).

~~b.~~**14.3** Material Safety Data Sheets shall be maintained for any chemicals used to treat cooling tower water and shall be provided to Ecology on request.

15. Facility Boilers:

~~a.~~**15.1** A18 Existing

~~i.~~**15.1.1** The facility boiler designated A-18 shall combust pipeline quality natural gas exclusively.

~~ii.~~**15.1.2** The A-18 Boiler shall be equipped with a non-resettable totalizing fuel meter.

~~iii.~~**15.1.3** Within 180 days of issuance of this approval order, emissions of NOx and CO from the boiler designated A-18 shall be tested by a third party tester in accordance with Conditions 18.2.4 and 18.2.5. Following the initial testing of the A-18 boiler, the ongoing test frequency shall be determined by Ecology (WAC 173-400-105(4)).

~~b.~~**15.2** B-5 New Boiler

~~i.~~**15.2.1** The concentration of NOx in the exhaust of the boiler designated B-5 shall not exceed 9 ppmv at 3% O2, nor a mass emission rate of 0.26 lb/hr.

~~ii.~~**15.2.2** The concentration of CO in the exhaust of the boiler designated B-5 shall not exceed 30 ppmv at 3% O2, nor a mass emission rate of 0.54 lb/hr.

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~~iii.~~**15.2.3** ~~The permittee shall provide notification of the date of initial start-up of Boiler B-5 to the address noted in Approval Condition 23 within 15 days of initial operation.~~

~~iv.~~**15.2.4** The permittee shall maintain records of the occurrence and duration of any start-up, shutdown, or malfunction in the operation of Boiler B-5.

~~v.~~**15.2.5** Operation and maintenance of the Boiler Designated B-5 shall be in accordance with manufacturer's recommendations and the facility computerized monitoring and maintenance system (CMMS).

~~vi.~~**15.2.6** Boiler B-5 shall combust pipeline quality natural gas exclusively.

~~vii.~~**15.2.7** Stack Sampling Requirement

~~1.~~**15.2.7.1** To determine initial compliance with Conditions 15.2.1 and 15.2.2, within 180 days of issuance of this Approval Order the boiler designated B-5 exhaust shall be tested for NOx and CO in accordance with testing Conditions 18.2.4 and 18.2.5 of this Approval Order.

~~2.~~**15.2.7.2** Following the initial stack sampling of the B-5 exhaust, a periodic testing schedule will be determined by Ecology in accordance with WAC 173-400-105(4).

16. Plant 1 Utilities

~~a.~~**16.1** Emergency Units: A37 – Utility Gen Set, A38 – Poly Gen 1, A39 – Poly Gen 2, A40 Fire Pump 1, A41 Fire Pump 2

~~i.~~**16.1.1** The emergency generator and fire pump engines identified identified in Condition 16.1 shall be equipped with non-resettable hours meters.

~~ii.~~**16.1.2** The engines identified in Condition 16.1 shall be operated no more than 260 hours per year each.

~~iii.~~**16.1.3** Operation and maintenance of the engines identified in Condition 16.1 shall be conducted in accordance with the manufacturer's specifications. The manufacturer's specifications and additional site-specific requirements shall be implemented using the facility computerized monitoring and maintenance system (CMMS) outlined in Condition 21 of this Approval Order.

17. Plant 3 and Plant 4 Utility Equipment

~~a.~~**17.1** B-6 and C-6 Emergency Gen Sets

~~i.~~**17.1.1** The emergency generator engines designated B-6 and C-6 shall satisfy the emission requirements for individual 2007 model year engines contained in 40CFR60 subpart IIII.

~~ii.~~**17.1.2** The emergency generator engines designated B-6 and C-6 shall be equipped with a non-resettable hours meter.

~~iii.~~**17.1.3** The emergency generator engines designated B-6 and C-6 shall be operated no more than 260 hours per year.

~~iv.~~**17.1.4** Operation and maintenance of the emergency generator engines designated B-6 and C-6 shall be conducted in accordance with the manufacturer's specifications. The manufacturer's specifications and additional site-specific requirements shall be implemented using the facility computerized monitoring and maintenance system (CMMS) outlined in Condition 21 of this Approval Order.

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~~v.~~17.1.5 The permittee shall satisfy the applicable notifications, reporting and recordkeeping requirements of 40CFR60.4214. The records shall be maintained in acoordance with Condition 22 of this approval order.

~~b.~~17.2 B-8 and C-8 Fire Water Pump Engines

~~i.~~17.2.1 The fire water pump engines designated B-8 and C-8 shall satisfy the emission requirements for individual 2008 and earlier model year engines contained in Table 4 of 40 CFR 60 subpart IIII.

~~ii.~~17.2.2 The fire water pump engines designated B-8 and C-8 shall be equipped with a non-resettable hours meter.

~~iii.~~17.2.3 The fire water pump engines designated B-8 and C-8 shall be operated no more than 260 hours per year.

~~iv.~~17.2.4 Operation and maintenance of the fire water pump engines designated B-8 and C-8 shall be conducted in accordance with the manufacturer's specifications. The manufacturer's specifications and additional site-specific requirements shall be implemented using the facility computerized monitoring and maintenance system (CMMS) outlined in Condition 21of this Approval Order.

~~v.~~17.2.5 The permittee shall satisfy the applicable notifications, reporting and recordkeeping requirements of 40CFR60.4214. The records shall be maintained in acoordance with Condition 22 of this approval order.

~~c.~~17.3 Maintenance Surface Coating Booth (Equipment ID No. A-44)

~~i.~~17.3.1 Consumption of surface coatings as reduced for application shall not exceed 150 gallons per year.

~~ii.~~17.3.2 Application equipment shall be airless spray design.

~~iii.~~17.3.3 Booth filters shall be designed to remove 98% of the over-spray solids that remain in the exhaust at the filter location.

~~iv.~~17.3.4 Manufacturer's recommended filter failure instrumentation shall be installed and properly maintained to indicate fouling of the filters, and filters shall be replaced at the recommended instrument indication.

~~v.~~17.3.5 A closed-system gun and application reservoir cleaning system shall be employed for cleaning application equipment. There shall be no spraying or open containers of solvent associated with paint booth spray equipment cleaning activities outside of the cleaning station.

~~vi.~~17.3.6 All containers of solvent containing mixtures shall be sealed to prevent evaporation except when actively being filled or transferred.

~~vii.~~17.3.7 The manufacturer's specifications and additional operation-specific requirements for the paint booth filters and instrumentation, the application equipment, and the application equipment cleaning system shall be implemented using the facility computerized monitoring and maintenance system (CMMS) outlined in Condition 21 of this Approval Order, or as otherwise approved in writing by Ecology.

18. TESTING REQUIREMENTS

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~~a.~~**18.1** Performance testing shall be performed at such times and frequencies specified in a condition of approval in this Order and at other times in accordance with WAC 173-400-105(4).

~~b.~~**18.2** Performance testing shall utilize the following test methods unless an alternative method is requested by the permittee and approved by Ecology in writing:

- ~~i.~~**18.2.1** Visual determination of the opacity emissions from stationary sources per Title 40 Code of Federal Regulations, Part 60, Appendix A, Method 9. (referenced as Method 9)
- ~~ii.~~**18.2.2** PM per Title 40 CFR 60, Appendix A, Method 5.
- ~~iii.~~**18.2.3** PM10 per 40 CFR 60, Appendix A, Methods 5 and 202
- ~~iv.~~**18.2.4** NOx per 40 CFR 60, Appendix A, Method 7E
- ~~v.~~**18.2.5** CO per 40 CFR 60, Appendix A, Method 10 B
- ~~vi.~~**18.2.6** HCl per 40 CFR 60, Appendix A, Method 26 or 26A
- ~~vii.~~**18.2.7** Chloride content of fuel gas per 40 CFR 60, Appendix A, Method 26 or approved alternate method.
- ~~viii.~~**18.2.8** Plant surveys for the presence of opacity from control devices shall be performed using the techniques and procedures in 40 CFR 60, Appendix A, Method 22.

~~c.~~**18.3** Testing Logistics - The permittee shall provide testable emission points, sampling ports, safe access to sampling points and ports, and utilities for sampling and testing.

~~d.~~**18.4** Number of Test Runs - Performance or compliance testing of each piece of pollution control equipment shall consist of three separate runs of at least 60-minutes each.

~~e.~~**18.5** Throughput during Testing - During testing, the process shall be operated at a minimum of ninety percent (90%) of rated capacity for equipment with less than 12 months operating history, ~~-~~or 90 to 110% of the maximum process rate recorded during the preceding 12 month period for equipment operated for 12 months or more. Operation of the process during testing outside of the specified range may be proposed, but may result in an operational restriction that will be amended to this Approval Order.

~~f.~~**18.6** Submittal of Performance Test Plan - A written test protocol that includes a description of the equipment to be tested, the process and control device operating information to be collected during the test, and the sampling and analytical method(s) proposed, shall be submitted to Ecology at least 30 calendar days prior to the start of any performance test.

~~g.~~**18.7** Notification of Inability to Conduct Performance Test - If the permittee is unable to conduct any performance test as scheduled, Ecology shall be notified at least 24-hours before the test at the address under “Reporting”, Condition 22, or via telephone at 509-329-3400.

~~h.~~**18.8** Plant Operator during Testing - The plant process equipment shall be operated and controlled by normal plant operators during the period when the performance testers are on-site to conduct testing and during actual testing.

~~i.~~**18.9** Performance or Compliance Testing Results - The results of all initial performance testing and all other periodic performance testing shall be sent to the address at ~~APPROVAL~~ Approval Condition~~ONDITION 22~~23. One copy of the completed test report shall be submitted no later than 60-days after the last day of the testing.

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19. LEAK DETECTION AND REPAIR

~~a.~~19.1 A facility-wide program of leak detection and prompt repair of leaks discovered during inspections is required by this order. The facility computerized monitoring and maintenance system (CMMS) includes voluntary procedures to control leaks to a degree representing BACT for this type of emission source. Specific requirements by process area are listed below:

~~i.~~19.1.1 Accessible piping and pumping components of chlorosilane-containing streams in silicon tetrachloride and silicon trichloride receiving, storage, and feed, and in the hydrogenation and distillation areas and the metal chloride areas shall be inspected (visually) for leaks no less frequently than monthly.

~~ii.~~19.1.2 Accessible piping and pumping components of silane-containing streams in the silane storage, compression, loading, and reactor feed areas shall be inspected (visually) for leaks no less frequently than monthly.

~~iii.~~19.1.3 Piping and plumbing in the new fluidized bed reactor area will be monitored for leaks instrumentally. In addition each reactor will be pressure tested during turnarounds of the batch reaction process.

~~iv.~~19.1.4 Accessible piping and pumping components of the refrigeration systems (B-21A and B21B) shall be inspected for leaks (visually) no less frequently than monthly.

~~v.~~19.1.5 A first attempt at repair of any leaking components shall be made no later than 7 days after discovery

~~vi.~~19.1.6 Records shall be maintained of the results of inspections and the results of repairs. The leak detection and repair records shall be maintained in accordance with Condition 22 of this approval order.

20. MONITORING

~~a.~~20.1 The Primary Degasser Filter shall be equipped with pressure gages or a differential pressure gage to monitor the differential pressure across the filter media.

~~b.~~20.2 Plant 1 baghouses and filtration systems shall be equipped with differential pressure instrumentation or the manufacturer's recommended filter failure instrumentation.

~~c.~~20.3 Plant 3 and 4 baghouses and filtration systems shall be equipped with differential pressure instrumentation or the manufacturer's recommended filter failure instrumentation that shall indicate failure in a location readily accessible to equipment operators.

~~d.~~20.4 Scrubbers shall be equipped with the manufacturer's recommended instrumentation including gas flow, circulating liquor and blowdown flow measurement, pH (where neutralizing liquors are proposed), and differential pressure (particularly for venturi sections of medium or high energy venturi scrubbers).

21. OPERATING & MAINTENANCE (O&M) REQUIREMENTS

Site-specific O&M requirements shall be developed and followed. Manufacturers' information and instructions may be referenced. The operating and maintenance requirements for equipment at the REC SGS facility shall be reflected in the facility computerized monitoring and

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maintenance system (CMMS). The CMMS shall be continuously updated to reflect any modifications of the plant or operating procedures. The CMMS shall at a minimum include:

~~a.~~**21.1** Normal operating parameters for the reactors, degassers, bead coolers, and filters,

~~b.~~**21.2** a maintenance schedule for the reactor systems, including filter media inspection frequency,

~~c.~~**21.3** process monitoring instrumentation quality assurance/quality control (QA/QC) procedures,

~~d.~~**21.4** recordkeeping and reporting requirements for operation of the reactor systems,

~~e.~~**21.5** upset conditions procedures, including leak repair procedures and requirements for the prompt repair of identified leaks, and

~~f.~~**21.6** Corrective measures for filtration systems in the event that ~~monthly~~ Method ~~22~~ 9 ~~surveys~~ determinations indicate a violation of an opacity limit in this Approval Order~~discover visible emissions from any filtration system at the facility~~.

22. RECORDKEEPING

~~a.~~**22.1** Specific records shall be kept on-site by the permittee and made available for inspection by Ecology upon request. The records shall be organized in a readily accessible manner and cover a minimum of the most recent 60-month period. The records to be kept shall include the following:

~~i.~~**22.1.1** A 12-month rolling total emission inventory of criteria and toxic air pollutants. The inventory shall include emissions from all emission points at the facility and shall utilize emission estimating techniques approved by Ecology. These records shall be maintained in an organized fashion, shall be readily accessible, and shall be provided to representatives of Ecology on request.

~~ii.~~**22.1.2** Records specified in Approval Conditions of this Order including the following:

~~1.~~**22.1.2.1** Condition 3.2, Total Metallurgical Grade Silicon (MGS) received by the facility on a rolling 12 month basis;

~~2.~~**22.1.2.2** Conditions 4~~..2~~.3.1, 5.14.1, 7.3.6, 9.2.4, and 11.2.6, records of opacity observations during monthly Method 22 surveys;

~~3.~~**22.1.2.3** Conditions 7.5.8, 7.6.7, 9.1.2.5, records of flow rate and duration of use for various intermittently- used control devices; and

~~4.~~**22.1.2.4** Other records required in Conditions ~~12~~3.6, 12.1, 12.2, 12.3, 12.5.1, 13.5.3~~6~~, 14.2, 15.2.4, 17.1.5, 17.2.5, and 19.1.6.

~~iii.~~**22.1.3** **Nature and details of any emergency or other situation** (date/time, duration, cause, etc.) that includes situations where any facility equipment was operated while any portion of the emission control system(s) that equipment is normally exhausted through was not functioning.

~~iv.~~**22.1.4** A file of any **performance testing results**.

~~v.~~**22.1.5** **CMMS maintenance records**.

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~~vi.~~22.1.6 The CMMS records of leak inspections and repairs shall be used to record the date/time and results of such maintenance activities. Inspection locations shall be clearly identified in the CMMS records.

~~vii.~~22.1.7 Material Safety Data Sheets (MSDS) or equivalent for each coating formulation and solvent used in the A-44 Paint booth

23. REPORTING

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The following reports shall be sent, within 30 days following the end of the calendar year unless otherwise noted below, to:

Washington State Department of Ecology
Regional Air Quality Section
4601 N. Monroe, Suite 202
Spokane, WA 99205-1295

~~a.~~23.1 A calendar- year **emission inventory** for all the annual emissions from the entire facility using emission factors approved by Ecology. The initial list of approved factors will be provided by Ecology to REC prior to the first annual report and may be modified only upon written approval from Ecology. The emissions inventory shall include criteria and toxic air pollutant emissions and shall include total process emissions and emissions released by any upset condition or plant component failure. Each criteria and toxic air pollutant shall be totaled separately, and summarized in tabular format at the end of the emissions inventory. Separate documentation shall be included for each excess emission event as specified in Approval Condition 2.1 above.

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~~b.~~23.2 The annual emission inventory shall include the annual consumption of MGS and the production rate of silane, polysilicon, and any other product that has been produced and shipped offsite for sale.

~~c.~~23.3 The final form of the annual emission inventory is subject to Ecology approval, and shall be submitted in a manner that facilitates a clear and accurate accounting of total plant annual emissions.

~~d.~~23.4 The **nature and details of any emergency or other situation** per the recordkeeping at APPROVAL CONDITION 22.1.2.

~~e.~~23.5 The results of any **performance or compliance testing** shall be sent to the above address no later than 60 days following such testing.

GENERAL CONDITIONS

~~13.~~1. **Visible Emissions** - No visible emissions shall be allowed beyond the property line, as determined by opacity readings.

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~~14.~~2. **Commencing/Discontinuing Construction and/or Operations** - This Approval Order shall become void if construction of the expansion project is not

commenced within eighteen (18) months following the date of this Approval Order, or if construction of the expansion project is discontinued for a period of eighteen (18) months.

~~15.~~3. **Compliance Assurance Access** - Access to the source by EPA or Ecology shall be allowed for the purposes of compliance assurance inspections. Failure to allow access is grounds for revocation of this Approval Order and enforcement under applicable regulations.

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~~16.~~4. **Availability of this Approval Order** - Legible copies of this Approval Order shall be available to employees in direct operation of the SGS Moses Lake Facility and be available for review upon request by Ecology.

~~17.~~5. **Equipment Operation** - Operation of the SGS facility shall be conducted in compliance with all data and specifications submitted as part of NOC applications and in accordance with the CMMS O&M requirements, unless otherwise approved in writing by Ecology.

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~~18.~~6. Emissions that result from failure to follow the specifications of the CMMS O&M system or manufacturer's instructions may be considered proof that the SGS facility was not properly operated, maintained and tested.

~~19.~~7. **Activities Inconsistent with this Approval Order** - Any activity undertaken by the permittee or others, in a manner that is inconsistent with information in the NOC application or this Approval Order, shall be subject to Ecology enforcement under applicable regulations.

~~20.~~8. **Obligations under Other Laws or Regulations** - This Approval Order shall not be construed to relieve the permittee of its obligations under any local, state or federal laws or regulations.

~~21.~~9. **Fees** - Per WAC 173-400-116, this Approval Order and related regulatory requirements have a fee associated for review and issuance. This Approval Order is effective upon Ecology's receipt of said fee.

~~22.~~10. All plans, specifications, and other information submitted to the Department of Ecology relative to this project and further documents and any further authorizations or approvals or denials in relation thereto shall be kept at the Eastern Regional Office of the Department of Ecology in the "Air Quality Controlled Sources" files and by such action shall be incorporated herein and made a part hereof.

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~~23.~~11. Nothing in this approval shall be construed as obviating compliance with any requirement of law other than those imposed pursuant to the Washington Clean Air Act and rules and regulations thereunder.

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~~24.~~12. A 180 day testing and break-in period is allowed, after any part or portion of this project becomes operational, to make any changes or adjustments required to comply with applicable rules and regulations pertaining to air quality and conditions of operation

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imposed herein. Thereafter, any violation of such rules and regulations or of the terms of this approval shall be subject to the sanctions provided in Chapter 70.94 RCW.

~~25.~~13. Authorization may be modified, suspended, or revoked in whole or part for cause including, but not limited to, the following:

~~1.~~**13.1** Violation of any terms or conditions of this authorization;

~~2.~~**13.2** Obtaining this authorization by misrepresentation or failure to disclose fully all relevant facts.

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

DATED at Spokane, Washington this 6th day of March, 2009.

PREPARED BY:

Robert Koster, P.E.
Eastern Regional Office
Air Quality Program
Department of Ecology

APPROVED BY:

Karen K Wood
Air Quality Section Manager
Air Quality Program
State of Washington
Department of Ecology
State of Washington