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8 July 2016

Melanie Morash
Remedial Project Manager
U.S. Environmental Protection Agency
Region 9
75 Hawthorne Street (SFD-7-1)
San Francisco, CA 94105

*RE: Response to EPA Comments Received 28 June 2016 RES084/085 Field
Mitigation Activities
Offsite Operable Unit, Sunnyvale, California*

Dear Ms. Morash:

This letter is submitted on behalf of Philips Semiconductors Inc (Philips) in response to the comments received on 28 June 2016 with regard to the RES084/085 mitigation installation on 20-21 June 2016.

Locus acknowledges and appreciates EPA's recognition that "the membrane installation appears to have been completed professionally and was installed to the standard level of practice among other professionals doing this type of work." Both Locus and the selected mitigation installer (MI) have installed many effective mitigation systems over a long period of time, and Locus, the MI, and EPA share the common goal that all installations are effective. Based on comments received by EPA, it is apparent that this was the first mitigation system installation for this project to be completed by the current Locus/MI/EPA team. The discontent reflected in EPA's response to the 20-21 June installation activities was not predicted by Locus and the MI. Responses to EPA's concerns are provided herein and, as applicable, will be reflected in future mitigation plans and installations to the extent feasible and reasonable.

Since most of the topics described in these EPA comments were brought-forth and discussed on site during the RES084/085 system installation, it is recommended that future comments such as these be addressed through a post-mitigation conference call, rather than written comment-response format. However, since a response to these comments was requested in writing, this letter addresses those comments in the requested format.

Overall Installation Observations

EPA staff and contractors mobilized to the area on Monday, June 21, 2016. Mitigation system installation was to begin at 1:00 p.m. however the Locus subcontractor arrived approximately 30-45 minutes later.

Response: Locus believes it has found in the selected MI the best contractor for the OOU indoor air mitigation installations. Unfortunately the MI encountered unexpected traffic prior to arrival on site on 20 June 2016. This is unfortunately sometimes unavoidable when mobilizing a field operation including remote staff in an urban area frequented by traffic issues.

The materials and equipment specified in the Work Plan were delivered and installed at the site.

Overall the work plan was followed with a few deviations. The overall installation of the membrane followed the work plan, with the exception of the perforated piping not being installed first with the membrane subsequently being laid over the perforated piping. Rather, the membrane was partially installed and the perforated piping, in some instances, was slid under the membrane. In other instances these installation activities were done according to the work plan. EPA does not believe that this modification in work flow steps would affect the integrity or operation of the final system, however, field activities should closely follow the procedures spelled out in work plans. In general, the membrane installation appears to have been completed professionally and was installed to the standard level of practice among other professionals doing this type of work.

Response: Locus and the MI intended to and going forward intend to follow mitigation plan work flow steps throughout the variable field conditions encountered. As noted by EPA, some work flow steps do not affect the integrity or operation of the installed mitigation system. Therefore, some flexibility is requested to complete the system installations in a manner most efficient for the site conditions and installation staff.

Due to time constraints the overall installation was not completed during the one and a half days allotted for the work.

Response: As discussed with the EPA team onsite, some of the finishing touches for the installation were not completed in the first mobilization for technical and logistical reasons, as detailed in the comments below.

This was the first time this Locus/MI/EPA team has worked together for a mitigation installation. It is not surprising that the installation took longer than expected. The additional water intrusion mitigation task provides additional scheduling issues unique to RES084/085. Although it is possible that future installations may be similarly affected by technical and logistical changes that necessitate changes in schedule, that is not expected to be the norm.

The exterior fan work was completed per the work plan and referenced guidance, however, care could have been taken to make the installation look more professional. For example, use of a level, mounting techniques, use of drain, waste, vent DWV fittings instead of pressure

fittings, use of PVC primer prior to application of PVC cement, and use of premade system components (i.e. varmint guards) versus a screen attached to the top of the exhaust.

Response: As EPA noted, "the materials and equipment specified in the Work Plan were delivered and installed at the site." There were no deviations from material specifications in the EPA-approved Work Plan. Regarding specifications, refer to responses to individual EPA comments on specifications (below). Additionally, varmint guards were not specified in the Work Plan and do not provide any substantial benefit for the mitigation system effectiveness over the materials used; Locus would like the flexibility to use screen material such as that provided for RES084/085.

The Christmas tree buttons were not installed and will be done at a later date. The water intrusion remedy for the exterior sealing of the concrete was not completed during the two days on-site, therefore could not be inspected or evaluated.

Response: The Christmas tree membrane fasteners were not available at the time of installation due to commercial availability of these components. However, since these fasteners are typically only installed in structures on sloped surfaces to prevent the membrane from sliding downhill, it was determined that there would be no consequences to installing the fasteners at a later date for this structure on level grade. It was decided during the installation, and confirmed by EPA contractors, that it was not advisable to apply paint or water sealant until the mitigation system operation could be confirmed through sampling. These products may contain trace levels of VOCs which could interfere with the interpretation of post-mitigation sampling results.

Specific items that deviated from the work plan are as follows:

- *The alarm installed was only audible from the back yard. It could not be heard inside the residence.*

Response: As stated in the mitigation plan "The owner agreed to signage and audible alarm outdoors on a panel near the vent stack. Upon solicitation of feedback to mitigation plan revisions, the owner will be informed that the audible alarm (a remote annunciator wired from the alarm unit near the fan) is preferred to be located indoors in each side of the duplex. If effective remote communication systems are feasible at the site, the alarm system may communicate with Locus directly." Consistent with the mitigation plan, the alarm was installed at the owner's preferred location. Additionally, as discussed on-site and accommodated for in the mitigation plan, remote communication systems appear to be feasible at the site and the forthcoming alarm dialer will communicate directly with Locus, once installed. The remote dialer configuration is currently being designed by Locus.

- *No labels were applied to any of the system components, which is a deviation from the stated reference of ASTM E2121.*

Response: A label was affixed to the fan circuit and the visible alarm panel during installation. Posted placards, as approved in the RES084/085 O&M Plan, are currently being manufactured. Weather-proof labels will be affixed to system

components at the follow-up site visit and at future installations. Mitigation plans submitted on or after 5 July (will) specify these labels. This labeling may be subject to input from the property owner(s).

- *No Dwyer series 2000 magnehelic was installed.*

Response: The mitigation plan accommodates the optional add-on of a magnehelic manometer by owner request. At RES084/085, the owner did not request the add-on, and there was no deviation from the mitigation plan. The mitigation plan language with respect to the magnehelic manometer is an example of flexibility built into the mitigation plan; the optimal flexibility in mitigation plan language is currently under review by both EPA and Locus based on this and other feedback received from EPA on 1 July. Many property owners and occupants would prefer to have only the simple green/red indicator light for the system instead of a manometer which provides limited usable information for them.

- *Screen mesh used as a varmint guard was smaller than the stated opening. Page 2 of the work plan stated that no smaller than 1/2" opening would be used however the mesh used had 1/4" openings. While this may not make a significant difference operationally, it is a deviation from the work plan that should be addressed.*

Response: Just prior to the RES084/085 installation, Locus recognized that the more accurate sizing for the screen is *no larger than 1/2"* opening, and mitigation plans submitted after 17 June contain the preferred language. As noted, this change in screen size has no effect on the operation of the mitigation system, and smaller sizes are generally preferred for these screens.

- *A fan shroud was not installed as per the work plan. While this would not make impact the system operation, it is a deviation from the work plan that should be addressed.*

Response: The fan is rated for outdoor use and, therefore, does not require a shroud. In the case of RES084/085, EPA requested on-site that the fan be installed higher than eye level (atypical for the MI) whereas the shroud did not appear to be a concern, and, ultimately, was not installed. The shroud can be installed at future installations, as initially planned. This is an example of an in-field decision that led to a change from the mitigation plan. It may be difficult to pre-emptively accommodate in the mitigation plans all in-field decisions made by qualified personnel in the field.

- *The alarm was not installed under the fan shroud as the shroud was not used, rather the alarm was installed in a smaller weather resistant box with a hinged clear front door. Again, while this may not make a significant difference operationally, it is a deviation from the work plan that should be addressed.*

Response: The mitigation plan states "An audible alarm... will be installed under the fan shroud. If weather-proof covering is needed, a cover will be selected that allows viewing of the indicator light through a window or clear covering." Consistent with the

mitigation plan and discussion between the MI and EPA representatives during walkthroughs (in this particular case, during the 26 February small gym walkthrough), weather-proof covering was determined to be needed. This is another example of EPA-approved flexible language built into the mitigation plan, which is intended to allow for Locus and the MI to make this decision.

- *No placards were available for inspection*

Response: Placards as approved in the O&M Plan for RES084/085 (template for SMDS installations) include some minor language specific to the as-built installation. Placards were ordered upon installation of RES084/085 and are expected before the end of July. These placards have been tailored for the installation of all retrofit SMDS installations and, therefore, are expected to be available during the first mobilization of future installations of these systems.

Upon demobilization from the site the depressurization system was operational and residents that were home were given a tour/demonstration and brief explanation of the system and alarm.

Corrections and/or Modifications

For future mitigation installations, EPA recommends allotting adequate time to complete the entire installation per the work plan in one visit rather than returning at a later date to finish, as will be the case with the installation at this site. Continuity of work and considering the burden to the residents of multiple trips should be considered.

Response: EPA appears to be inferring that installation was not completed due to inadequate time. Rather, the portions of the system installation that were not completed were caused by unavailability of specific products or logistical issues as described above. Particularly as this is the first SMDS installed for a series of buildings at this site with similar construction, it was discussed with EPA staff onsite that confirmation of system effectiveness would be a higher priority than the second mobilization to add finishing touches that do not impact system effectiveness. The burden of multiple trips to the residents is of course being considered, but the owner and occupants for RES084/085 have not presented any concerns over this issue.

During the installation activities the EPA team also discussed with Locus the recommendation to install remote monitoring systems, as discussed in the work plan, as a standard way to notify Locus of a system failure, especially given the multiple language barriers and tenant turnover in this neighborhood. If this is to be a standard feature, then one could argue that alarm and magnahelic gauges may not be necessary at all. However, EPA recommends that these mitigation systems should have a device that clearly shows occupants, building owners, property managers or others (such as prospective buyers) that the system is operational. Additionally, the telemetry system should have back-up power (such as a battery backup), so that if the system fails Locus will regardless be notified via the remote monitoring system.

Response: As discussed earlier, the RES084/085 mitigation plan language included flexibility to accommodate owner request for a magnehelic manometer; the owner did not request one. Additionally, a magnehelic manometer would not add any substantial benefit to the operation of the mitigation system, since the owner and occupants are not expected to interpret manometer readings. The alarm indicator light, clearly visible through the weather-proof box, provides a simple intuitive indication of whether the system is operational. A remote dialer will call Locus directly at times of fan failure. The remote dialer and back-up power is addressed elsewhere in this letter.

System Improvements & Recommendations

There are several options that could make the overall installation better:

- *Scheduling ample time to complete all phases of the system installation during one visit is recommended, rather than multiple back-and-forth mobilizations to the site on different weeks.*

Response: See response above.

- *Adding a telemetry unit to notify Locus and EPA of a system failure, as described in the work plan, as a critical enhancement to the system.*

Response: As stated elsewhere in this letter, a remote dialer system is currently being designed since feasibility was established during system installation.

- *Using DWV (drain, waste vent) fittings instead of pressure fittings, as the DWV fittings are better for systems with higher air flow. The installation contractor should also be using a PVC pipe cleaner prior to the application of PVC glue to pipe joints and fittings.*

Response: Refer to responses to EPA specifications (below).

- *System labels should be applied during the installation and not at a later date, so the components are clearly labeled and identifiable by the tenants, building owner, property manager, or any other contractors called to the property.*

Response: Refer to response to earlier EPA comment regarding system labels.

- *Labels should be pre-determined and available during the installation or very shortly thereafter so the system is not confused or damaged by tenants, building owners or other contractors that visit the building before appropriate labels can be applied.*

Response: Refer to response to earlier EPA comment regarding system labels.

- *The labels should be clearly legible from 3 feet away and state “Active Soil Depressurization System, Do Not Disturb or Damage”, or something to that effect.*

Response: System labels will be clearly legible from 3 feet away. Placards will be clearly legible from 3 feet away, and placard language is as approved in the O&M Plan.

- *Labels shall be placed on the membrane, membrane piping in crawlspace, exterior piping, fan, alarm box and appropriate circuits.*

Response: Labels will be placed on these components.

- *The alarm should be connected to a different circuit than the fan, so that if the circuit for the fan gets turned off, then the alarm will sound. If they are both on the same circuit and the circuit is turned off, neither the fan nor alarm will work.*

Response: While this is correct, there is no way from preventing owners/occupants from disconnecting both circuits to disable the system. The monitoring and inspection program described in the mitigation plan will provide regular confirmation of system operation. If the system is found to be disconnected during those inspections, additional investigation will be initiated to determine the reason the system was turned off, and steps will be taken to ensure the system remains operational. Ultimately, the remote dialer will communicate directly with Locus in the event that the fan fails or is turned off for any reason. The remote dialer will have battery back-up or provide communication at known intervals so that in either case, electricity outages will be communicated to Locus. Therefore, if anyone turns off the fan, Locus will receive a notification to provide support. Locus will also be directly notified in the event of a power outage that shuts off the fan. Note that in all cases of fan outage, it would take at least several days for indoor air concentrations to exceed screening levels. Therefore, power outages or outages for any other reason are not an immediate concern to owners and occupants. The current electrical setup allows for the owner to easily silence the alarm; this setup does not accommodate an audible alarm in the case that the fan is manually turned off or power supply fails.

- *The alarm should be mounted where residents can hear it from inside the home. Based on the current location of the alarm, it can barely be heard directly inside the building. The alarm can be heard outside, but is muted where tenants enter the building.*

Response: This comment has been addressed in this letter (above) including remote monitoring capabilities.

- *The installation contractor installed the electrical service (outlet and switch) for the fan and the alarm. The electric supply was pulled off one of the main circuit panels on the rear of the home. There was no electrical permit pulled for this project, and there will be no electrical inspection to ensure that electrical connections meet all*

international, state and local code requirements and do not pose a life safety risk for occupants.

Response: After review with our certified electrical contractor with experience in the City of Sunnyvale, an electrical permit is expected to be required from the City, able to be pulled by the mitigation installer. This will be confirmed with the City prior to the start of the next installation and in regards to the completed RES084/085 installation.

- *Based upon EPA's observations of this mitigation system installation, adding specific language to the work plan would be of benefit to better define what materials are used and how they are to be installed, such as:*
 - *Piping shall be 4" schedule 40 PVC pipe and fittings (ASTM D-2665), white.*
 - *All elbows and fittings should be drain/waste/vent (DWV). Tee fittings should be sanitary fittings and installed in the direction of air movement to reduce friction losses. Double sanitary tee cleanout fittings should be used in manifold piping when air movement is from opposite directions.*
 - *Vertical pipe runs shall be supported at least every 8' and at every penetration through floors, ceilings or roof decks. Horizontal runs shall be supported, with code approved hangers, every 6 feet and within 2 feet of any fitting.*
 - *All PVC pipe connections shall be solvent cemented using a primer that complies with ASTM F-656 and PVC cement that complies with ASTM D-2564.*
 - *Joints will be made while solvent is wet and shall be in accordance with ASTM D-2885 and ASTM F402.*

Response: The above specifications are included in mitigation plans submitted on or after 5 July 2016.

- *A licensed electrician should be consulted to determine the appropriate wire sizes for the fan based on their electrical requirements and distance to the panel. Each fan will have a service disconnect within 6 feet of the fan for servicing. Dedicated breakers are recommended, but may not be strictly required. Breakers should be appropriately labeled to deter and prevent the fan power from being disconnected.*

Response: The above specifications are included in mitigation plans submitted on or after 5 July 2016.

- *All electrical work should have a permit, if required by the state, city or local jurisdiction and subsequent inspection prior to fully commissioning the system.*

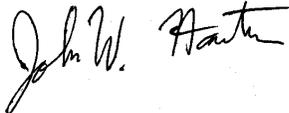
Response: After review with our certified electrical contractor with experience in the City of Sunnyvale, an electrical permit is expected to be required from the City, able to be pulled by the mitigation installer. This will be confirmed with the City prior to the start of the next installation.

- *Alarms or telemetry devices should be powered by an alternate circuit to ensure that the alarm will sound if the fan power is inadvertently turned off.*

Response: A remote monitoring device (as described earlier in this response letter) will be installed if found to be feasible with the structure's existing electrical configuration. Also refer to an earlier response to EPA's comment regarding the electrical setup for the alarm.

If you have any questions regarding this correspondence, please call me at (415) 799-9937.

Sincerely,

A handwritten signature in black ink that reads "John W. Hawthorne".

J. Wesley Hawthorne, PE, PG
President

JWH/njl

cc: (electronic copies)
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