

### **Task 01.FP – Vapor Pre-Design Field Preparation**

Scope – This task will involve reviewing existing data to complete the following:

- Develop a Pre-Design Investigation (PDI) Sampling and Analysis Plan (SAP) for sample collection to assess vadose zone source areas across Building 4
- Review of current site conditions and design of SSDS extraction plan. Location placement will be optimized given facility infrastructure. This task will include a detailed review of source area delineation and vapor plume concentration distribution maps as well as accessibility for drilling services.
- Update the Site Health and Safety (H&S) plan
- Charter the field team
- Subcontracting
- Evaluate health and safety concerns and conducting a HAZOPs meeting
- Evaluate effects of vapor removal on Building 4 envelope
- Develop project instructions
- Development of Design Quality Management Plan

The product of this task will be a Sample and Analysis Plan (SAP), updated H&S plan, project instructions for the pre-design investigation and HAZOPs review summary.

### **Task 01.FI – Vapor Preliminary Design Pilot Investigation**

Scope –Areas in Building 4 have been identified for further investigation to define/delineate and develop a stratigraphic understanding of likely vapor extraction areas. Additionally, Jacobs will gather information to assist in a remedial evaluation and design of the pilot study for Building 4. This task involves the following activities (subtasks):

- Groundwater Level Study
  - A groundwater elevation study will be conducted at Building 4 for a period of one year. Groundwater level readings will be manually recorded on a monthly basis at seven monitoring wells locations and the data will be downloaded and assessed. This data will be used to monitor groundwater water level elevations for building 4 and the surrounding features to determine whether the elevated water table along the northern edge of the building is continuously present under natural long-term conditions, and to confirm the degree to which the vadose zone is consistently present under other portions of the slab.
  - A review of subsurface flow characteristics will be performed, including a review of previous pump tests, historic groundwater level review, soil permeability, the presence of potential obstructions or pathways, and possible short-circuiting issues that could be relevant to the mitigation/remediation system.
  - A comprehensive assessment of the effects of placing a vacuum in the subslab at specific locations will be developed to determine potential problems including the formation of sulfuric acid, due to adding air to the system. Additionally, evaluate to the extent feasible, the likely effects of mobilizing soil gas through these areas of the formation. A review of current map of subslab features, geophysical data review and slab integrity using data from previous projects including visually observed macroscale voids under building 4.
  - A meteorology station that will be mounted onsite, preferably between building 4 and the canal. The unit will monitor, rainfall and wind speed/direction. Rainfall data will aid in interpreting water level readings on site, winds speed and direction conditions will aid in determining what may affect the air flow within building 4.
- Preliminary Design Pilot Study Installation and Evaluation
  - Perform a technical feasibility study for treatment of effluent from the SSDS pilot system to include an Evans infrastructure review and use of the existing onsite air scrubber, electrical services and piping runs for both pilot and ultimately full-scale system implementation. (Dow will need concurrence from Evans on the use of their onsite scrubber during this phase).

- Perform a permit review of existing discharge permits that may be used for the operation of the pilot study and ultimately full-scale system implementation.
  - Interview Evans management and conduct a logistical analysis with Evans to assess piping for the SSDS vapor delivery system to the onsite air scrubber.
- Field pilot testing will be performed at Building 4 to evaluate subslab soil flow characteristics under the application of suction. This task includes the following activities:
  - Install 3 extraction points in areas of mass deficiency revealed during the recent microgravity survey to further characterize permeability under building 4 and to serve as suction points for the pilot study with effluent going to the Evans onsite scrubber. This includes the installation of (3) 4 inch borings down to 2 feet and installation of 3" ID extraction pins in each boring, and the installation of five ¼" monitoring pins below slab in a radial distribution to measure radius of influence (ROI) during suction testing. The ROI study will be performed using existing soil vapor points, existing monitoring wells and the 5 newly installed radial monitoring pins completed at varying distances from the suction test hole using the existing glove box.
  - Apply varying levels of suction to the above extraction test holes using either the Evans scrubber vacuum or an intrinsically safe portable blower /suction gauge unit piped into Evans Chemetics onsite air scrubber by Evan's onsite personnel. Sample the vapors at beginning, mid-point and end of testing to determine changes in concentration over time to assess the effectiveness of the vapor removal, to estimate flux to the scrubber unit and to estimate remediation time (if possible). Samples will be gathered and sent to a qualified laboratory for analyses. Field readings will be collected where possible. A second sampling event will take place a week after the conclusion of the pilot test to monitor the regeneration rate of hydrogen sulfide (H<sub>2</sub>S) and Methane. During the pilot test, Jacobs staff will measure the corresponding levels of suction [inches water column (W.C.)] created at each test hole using a digital micromanometer as well as measure the extracted flow rate.
  - Additionally, H<sub>2</sub>S and methane will periodically be measured inside and outside the building in ambient air. Differential pressure gauges will monitor the suction piping and radial monitoring points.
  - The SSDS radial ROI test holes will be plugged and sealed after final installation if they will not be included as part of a full-scale system.
- A preliminary design pilot study report will be submitted evaluating the SSDS pilot study data. This report will summarize all aspects of the work performed. This report will be used to support the Building 4 remedial evaluation, planning, and team/client decision making for the path forward for full scale final remedial design.

## Dieter, Gail A (DEC)

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**From:** Newman, David/NJO <David.Newman@jacobs.com>  
**Sent:** Wednesday, November 28, 2018 1:44 PM  
**To:** Carling, Brian/PHL; Dieter, Gail A (DEC)  
**Cc:** Cibrik, Jerome (JE)  
**Subject:** RE: HCC - Vapor Pilot Testing Scope of Work

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Hi Gail - as a follow-up to Brian's email, all intrusive work will be performed inside Building 4 incorporating the glove box installation technique (completely contained boring process with a water dam, vented to the outside) and real time air monitoring at the box and exterior discharge. As with past indoor VI work, we will not be performing a CAMP, installations will be completed in Level B protection and Building 4 will be cleared of all Evans personnel. The air permitting process will also be completed prior to pilot testing. I will forward the field schedule as soon as finalized. Please let me know if you have any questions or concerns.

Thank you.

Dave

David A. Newman

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**From:** Carling, Brian/PHL  
**Sent:** Tuesday, November 27, 2018 10:29 AM  
**To:** Dieter, Gail A (DEC) <gail.dieter@dec.ny.gov>  
**Cc:** Cibrik, Jerome (JE) <cibrikje@dow.com>; Newman, David/NJO <David.Newman@jacobs.com>  
**Subject:** HCC - Vapor Pilot Testing Scope of Work

Hi Gail:

Attached you will find the Scope of Work for the upcoming Pilot Testing at Building 4. As noted in prior conversations, we have completed the conceptual layout of points and clearance of utilities and will be starting intrusive work the week of 12/10. Let me know if you have questions or comments. We are also working on a schedule that I will forward once completed.

Thanks

Brian S. Carling, P.G.

Jacobs

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