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Subject:  
Response to Comment – Interim Groundwater Monitoring Plan, August 3, 2020,  
Ford Livonia Transmission Plant, Livonia, Michigan

Environment

Date:  
September 25, 2020

Dear Mr. Owens:

Contact:  
Kris Hinskey

Ford Motor Company (Ford) appreciates your comments on the Livonia Transmission Plant (site) Interim Groundwater Monitoring Plan (IGMP) submitted to the Michigan Department of Energy, Great Lakes and Environment (EGLE) on May 20, 2020. On behalf of Ford, the following response to comment has been prepared by Arcadis of Michigan, LLC to propose a path forward for IGMP revisions with a goal of streamlining groundwater monitoring efforts at the LTP site.

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269-579-5402

Email:  
Kris.hinskey@arcadis.com

Your comment letter dated August 3, 2020, provided feedback regarding the initial IGMP submittal, including:

Our ref:  
30050315

- General Comment #1: *The plan does not provide the technical basis or rationale for the request to reduce the quarterly groundwater sampling.*
- General Comment #2: *The Plan does not contain adequate data to establish groundwater trends in the wells...It is the experience of EGLE staff that multiple years (5-10) are often needed to establish groundwater trends.*
- General Comment #3: *The information needed by EGLE will depend upon the wells and their objective. However, additional information and trend analysis will be needed for all wells for which you propose to adjust monitoring frequency.*

The comments indicate that additional data will be required by EGLE before monitoring changes at the site can be approved. The following provides a brief background and describes the technical basis and overall approach that will be used to revise the IGMP for resubmittal.

## Background

Ford completed site-wide groundwater sampling events in 2016 and 2017 and has completed quarterly monitoring at all available wells since third quarter 2017, consistent with the July 2017 Consent Decree (No: 2:1712372-GAD-RSW). There are currently 284 monitoring wells included as part of the quarterly monitoring program. The wells installed as part of the initial investigation activities (2015-2017, 93 total) have been sampled up to 15 times (excluding the LNAPL monitoring wells). A figure illustrating the location and the current number of samples for each well is provided as **Figure 1**.

Based on the quarterly monitoring and the results of the RI work, the groundwater impacts are delineated to applicable Part 201 Criteria upgradient (west), side-gradient (north and south) and downgradient (east), including off-site. The aquifer at the site is generally thin, consisting of a fining downward sequence of shallow sand/gravel transitioning to interbedded silt and fine sands and then clay at 20 to 30 feet below grade. Groundwater is encountered between 2 and 7 feet below grade; shallower in topographically low areas. The dominant groundwater flow direction is to the east/southeast on-site, and more easterly off-site. Based on the measured hydraulic conductivity and groundwater gradient, groundwater velocity likely ranges from 0.5 to 2 feet per day in the most permeable zones. Additional hydrogeologic data is provided as part of the 2017 draft Conceptual Site Model report provided to EGLE on August 25, 2017. A complete Remedial Investigation (RI) Report, including an updated conceptual site model, will be provided to EGLE in 2021.

## Demonstration of Technical Basis

In response to the comments provided by the EGLE, Ford will provide a technical basis for each well where reduced sampling frequency is proposed. One of the primary lines of evidence to evaluate analytical trends will be trend graphs and the Mann-Kendall Trend test. The Mann-Kendall trend test is a non-parametric test that determines trends based on ranked data. As such, it is relatively insensitive to small data sets, outlier values and non-detect concentrations and does not require the data to fit a specific model. The basic Mann-Kendall trend test is performed by listing the concentrations of the constituent of interest in temporal order and computing the differences between a given measurement and earlier measurements (Gilbert 1987; USEPA 2009).

Mann-Kendall requires a minimum of 4 samples to determine a trend; however, consistent with the Interstate Technology and Regulatory Council (ITRC) recommendations, we are proposing a minimum of 8 samples (i.e., 2 years of data or more) before the Mann-Kendall Trend Test will be applied (ITRC 2013).

For wells where a modification to sampling frequency is proposed, Ford will complete the following:

- Mann-Kendall trend analysis for wells with adequate sampling events (i.e. >8) and consistent analyte detections
- Monitoring wells with sporadic detections, less than 8 sampling events, are consistently non-detect, or otherwise inadequate data for Mann-Kendall analysis will continue to be monitored quarterly for minimum of 8 events.

Once the trend analysis is complete, monitoring wells will be evaluated to determine the most appropriate monitoring frequency based on location relative to source areas, groundwater impacts, remediation systems, and perceived risk to potential receptors. The results of the Mann-Kendall trend analysis, as

well as a summary of technical rationale used to propose changes to monitoring, will be provided as part of the revised IGMP.

### Proposed Approach

The stability of groundwater impacts at the LTP site will be evaluated in the context of known source areas, on-site active remediation (e.g., hydraulic control system [HCS]), the natural attenuation of constituents (i.e. vinyl chloride) downgradient of the HCS, and the constituent fate and transport characteristics in groundwater. A revised IGMP will be prepared for EGLE review and include the following general approach for various areas of the site (**Figure 1**):

- **On-site Area of Impact** - The on-site area of impact is well defined and not expected to change significantly over time. For area of impact wells:
  - Continue quarterly monitoring at wells with less than 8 sampling events. Evaluate analytical trends and plume stability for wells with 8 or more monitoring events.
  - Based on stability results, select key wells in the source area, along a transect within the impacted area core and as sentry wells at the source area fringe and downgradient for monitoring at reduced frequency.
  - Continue quarterly gauging of LNAPL MWs
  - Continue quarterly monitoring for HCS performance monitoring wells and wells at the eastern boundary downgradient of the HCS.
- **Upgradient, Side-gradient, Commercial Properties** - Groundwater flow direction at the site is well established. Change in concentration to side gradient and upgradient sentinel monitoring wells are unlikely in the absence of significant hydraulic changes at the site (e.g., changes to surface cover, changes to storm water collection system). For upgradient and side gradient wells:
  - Continue quarterly monitoring for wells with less than 8 monitoring events. Evaluate MWs with 8 or more events for reduced sampling frequency.
- **Off-site Area of Residential Impact** - The off-site residential properties with historical or on-going vinyl chloride impacts will be closely monitored for changes in concentration relative to the site-specific residential vapor intrusion criteria:
  - Continue quarterly sampling for residential wells with historical detections and/or within the area of impact (northern residential lobe).
  - For wells outside of the defined area of residential impact. Continue quarterly sampling for wells with less than 8 monitoring events.
  - Evaluate reduced frequency for wells with more than 8 sampling events that are consistently non-detect (e.g. southern residential lobe).

The goal of the approach is to produce a pragmatic and robust monitoring program that focuses on continued monitoring of plume stability, plume attenuation and plume migration, as well as remedy performance.

Mr. Paul Owens  
Michigan Department of Energy, Great Lakes and Environment  
September 25, 2020

As described above, the sampling frequency will be evaluated at on-site, side- and upgradient locations, but maintain quarterly monitoring relative to remedy performance and downgradient receptors. Only wells that are deemed redundant or little continuing monitoring value will be proposed to be eliminated from the monitoring program. Reduced monitoring frequency refers to moving quarterly sampling to semi-annual, to every three months (to maintain seasonality of data), or to annual sampling. The revised IGMP will include a table summarizing the proposed changes and technical rationale, as well as trend analysis for wells where changes are proposed. Once approved, future updates to the IGMP will be made as needed based on observed changes in condition and will be documented in the quarterly progress report.

If this approach is acceptable, a revised IGMP can be provided to the EGLE in 4<sup>th</sup> quarter 2020. Please let us know if you have questions or concerns or if you would like to discuss further.

Sincerely,

Arcadis of Michigan, LLC

Kris Hinskey  
Project Manager, Arcadis

Copies:  
[Copies]

Enclosures:

## Figures

- 1 Site Layout and Sample Summary

## References

Gilbert, R.O. 1987. *Statistical Methods for Environmental Pollution Monitoring*. New York: John Wiley & Sons, Inc.

ITRC (Interstate Technology & Regulatory Council). 2013. Groundwater Statistics and Monitoring Compliance, Statistical Tools for the Project Life Cycle. GSMC-1. Washington, D.C.: Interstate Technology & Regulatory Council, Groundwater Statistics and Monitoring Compliance Team. <http://www.itrcweb.org/gsmc-1/>.

USEPA. 2009. "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities." Unified Guidance EPA 530/R-09-007. Washington DC: United States Environmental Protection Agency. <http://www3.epa.gov/epawaste/hazard/correctiveaction/resources/guidance/sitechar/gwstats/unified-guid.pdf>.

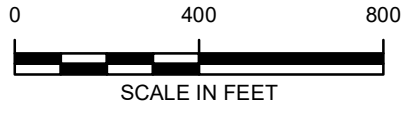
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CITY: Novi; DIV: ENV; DB: MG; PIC: R. ELLIS; PM: K. HINSKEY; PROJECT NUMBER: 30050315; COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet; T: ENV\Novi\Brighton\_MIFordLivonia\GISdocs\2020-09\Figure 1 Sample Count.mxd; PLOTTED: 9/24/2020 1:11:09 PM; BY: msmiller

**LEGEND**

- |   |                                     |     |  |     |                     |                           |
|---|-------------------------------------|-----|--|-----|---------------------|---------------------------|
| ▲ | PIEZOMETER OR LNAPL MONITORING WELL | --- | HYDRAULIC CONTROL SYSTEM WELL SCREEN     | --- | ESD-4 CARRIER PIPE  | <b>SAMPLE EVENT COUNT</b> |
| ● | TEST WELL                           | --- | WELL BLANK CASING                        | --- | HCS ELECTRICAL LINE | ● 0-3 EVENTS              |
| ■ | VAULT                               | --- | SSDS CONVEYANCE PIPING                   | --- | EDC DISCHARGE LINE  | ● 4-7 EVENTS              |
| ■ | SUCTION PITS                        | --- | FORD PROPERTY BOUNDARY                   | --- |                     | ● 8-11 EVENTS             |
|   |                                     | --- | COMMERCIAL/RESIDENTIAL PROPERTY BOUNDARY | --- |                     | ● >11 EVENTS              |
|   |                                     | --- | AREA OF CONCERN                          |     |                     |                           |



**NOTES:**  
 EDC = EASTERN DIVERSION CHAMBER  
 ATNPC = AUTOMATIC TRANSMISSION NEW PRODUCT CENTER  
 EGLE = MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY  
 SSDS = SUB-SLAB DEPRESSURIZATION SYSTEM  
 HCS = HYDRAULIC CONTROL SYSTEM  
 ESD = EASTERN STORM DRAIN

FORD MOTOR COMPANY  
 LIVONIA TRANSMISSION PLANT  
 LIVONIA, MICHIGAN

**SITE LAYOUT AND SAMPLING SUMMARY**

**ARCADIS** Design & Consultancy for natural and built assets

FIGURE 1