

**DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION**

Interim Final 2/5/99

**RCRA Corrective Action**

**Environmental Indicator (EI) RCRIS code (CA750)**

**Migration of Contaminated Groundwater Under Control**

**Name:** Former General Motors Corporation Livonia Powertrain Site  
**Facility Address:** 12200 Middlebelt Road, Livonia, Wayne County, Michigan  
**Facility EPA ID #:** MID000718874

1. Has all available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

  X   If yes - check here and continue with #2 below.

       If no - re-evaluate existing data, or

       If data are not available skip to #6 and enter "IN" (more information needed) status code.

**BACKGROUND**

**Definition of Environmental Indicators (for the RCRA Corrective Action)**

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

**Definition of "Migration of Contaminated Groundwater Under Control" EI**

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

**Relationship of EI to Final Remedies**

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

**Duration / Applicability of EI Determinations**

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

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2. Is **groundwater** known or reasonably suspected to be “contaminated”<sup>1</sup> above appropriately protective “levels” (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

\_\_\_\_\_ If yes - continue after identifying key contaminants, citing appropriate “levels,” and referencing supporting documentation.

☒ If no - skip to #8 and enter “YE” status code, after citing appropriate “levels,” and referencing supporting documentation to demonstrate that groundwater is not “contaminated.”

\_\_\_\_\_ If unknown - skip to #8 and enter “IN” status code.

**Rationale and Reference(s):**

*The presence of “contamination” has been assessed through the review of regional and local background conditions, as appropriate, relative to Site characterization data for soil and groundwater samples, and the comparison of Site characterization data for soil and groundwater samples with screening criteria developed by the Michigan Department of Environmental Quality (MDEQ) to facilitate implementation of Part 201 of the Natural Resources and Environmental Protection Act, 1994 Public Act 451, as amended (MDEQ, 28 September 2012). The assessment of regional and local background conditions, and the results of the comparison of Site characterization data with the Part 201 screening criteria are discussed in Section 4 of the RCRA Facility Investigation Report (Haley & Aldrich, 15 March 2013) (RFI Report).*

*The following Part 201 screening criteria were used to evaluate the Site characterization data:*

**Soil**

- Part 201 Nonresidential Drinking Water Protection Criteria;
- Part 201 Nonresidential Indoor and Ambient Air Criteria;
- Part 201 Nonresidential Direct Contact Criteria;

**Groundwater**

- Part 201 Nonresidential Drinking Water Criteria;
- Part 201 Nonresidential Direct Contact Criteria;
- Part 201 Nonresidential Volatilization to Indoor Air Inhalation Criteria
- Water Solubility Levels;
- Flammability and Explosivity Levels; and
- Acute Inhalation Levels.

*Of the soil screening criteria listed above, only the Part 201 Nonresidential Drinking Water Protection Criterion for arsenic was exceeded (two samples at two locations, but not more than two times the criteria).*

*Groundwater sampling was performed at the Site on two occasions, once in August 2012 and again in December 2012. The results of the first round of sampling indicated the presence of arsenic and lead in Site groundwater at concentrations exceeding corresponding Part 201 Nonresidential Drinking Water criteria.*

*It is well known that these constituents are commonly linked to the presence of sediments in the groundwater. Evidence of this is observed with respect to the initial round of Site groundwater results, as filtered sample results are lower than the unfiltered results. Specifically, in all but one case of comparable data sets in which*

**Footnotes:**

<sup>1</sup>“Contamination” and “contaminated” describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate “levels” (appropriate for the protection of the groundwater resource and its beneficial uses).

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*one of these constituents were exceeded in the unfiltered sample, the corresponding filtered concentration was shown to be either "non-detect" or below criteria.*

*In cases where constituent presence in groundwater is believed to be attributed to sediment, conditions for obtaining groundwater samples that are more representative and appropriate for risk evaluation are often improved with well surging and further purging, and the employment of ultra-low-flow sampling techniques.*

*As such, in November 2012, prior to initiating the second round of groundwater sample collection, the targeted wells were carefully developed in an attempt to remove soil particles from the wells (gentle surging and low-flow purging). Following this careful development, the December 2012 groundwater samples were collected using ultra-low-flow sampling techniques, with sample withdrawal rates of 80 milliliters per minute or less), as a further measure to obtain more representative groundwater samples.*

*Upon comparing corresponding data for the August 2012 groundwater sampling event to the December 2012 groundwater sampling event it is observed that, in most cases, the concentrations of arsenic increased slightly within the relative same order of magnitude on a well-to-well comparison. It is further observed that lead exceeded the noted criteria in the samples collected in August 2012; however, lead was not detected in the groundwater samples collected from these wells in December 2012. It is believed that the sampling methods, including careful well development techniques and ultra-low-flow sampling, employed in as part of the December 2012 event produced data most representative of Site conditions.*

*The December 2012 data indicate Site groundwater is not contaminated with lead above the associated screening criterion. However, one filtered groundwater sample exceeded the Nonresidential Drinking Water Criterion for arsenic. The arsenic detects appear to be present as a result of natural conditions (i.e. types of soil deposits), and not attributable to Site operations based on the following information:*

- Arsenic is not known to have been used at the Site, nor is there high confidence that it was a component of Site-related activities;*
- All but one arsenic exceedance of Nonresidential Drinking Water Criteria is associated unfiltered samples, indicating the presence of arsenic in Site groundwater is associated nearly exclusively with filterable soil particulates;*
- Variability of arsenic concentrations between sampling events and among samples of each event is low (i.e. similar order of magnitude on a well-to-well comparison which indicates that it is likely a background constituent in groundwater);*
- All exceedances of Nonresidential Drinking Water Criteria for arsenic are within the collective range of concentrations typical of well water of Wayne County and the adjacent Washtenau County (greater than 0.05 mg/L), as described in MDEQ public outreach information<sup>2</sup>, which indicates that it is likely a background constituent in groundwater.*

<sup>2</sup> [http://www.michigan.gov/documents/deq/deq-wd-gws-wcu-arsenicwellwater\\_270592\\_7.pdf](http://www.michigan.gov/documents/deq/deq-wd-gws-wcu-arsenicwellwater_270592_7.pdf)

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3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within “existing area of contaminated groundwater”<sup>2</sup> as defined by the monitoring locations designated at the time of this determination)?

\_\_\_\_\_ If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the “existing area of groundwater contamination”<sup>3</sup>).

\_\_\_\_\_ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the “existing area of groundwater contamination”<sup>2</sup>) - skip to #8 and enter “NO” status code, after providing an explanation.

\_\_\_\_\_ If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s):

<sup>3</sup> “existing area of contaminated groundwater” is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of “contamination” that can and will be sampled/tested in the future to physically verify that all “contaminated” groundwater remains within this area, and that the further migration of “contaminated” groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

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4. Does "contaminated" groundwater **discharge** into **surface water** bodies?

\_\_\_\_\_ If yes - continue after identifying potentially affected surface water bodies.

\_\_\_\_\_ If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.

\_\_\_\_\_ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

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5. Is the **discharge** of “contaminated” groundwater into surface water likely to be “**insignificant**” (i.e., the maximum concentration<sup>3</sup> of each contaminant discharging into surface water is less than 10 times their appropriate groundwater “level,” and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

\_\_\_\_\_ If yes - skip to #7 (and enter “YE” status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration<sup>4</sup> of key contaminants discharged above their groundwater “level,” the value of the appropriate “level(s),” and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

\_\_\_\_\_ If no - (the discharge of “contaminated” groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration<sup>3</sup> of each contaminant discharged above its groundwater “level,” the value of the appropriate “level(s),” and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations<sup>3</sup> greater than 100 times their appropriate groundwater “levels,” the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

\_\_\_\_\_ If unknown - enter “IN” status code in #8.

Rationale and Reference(s):

<sup>4</sup> As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

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6. Can the **discharge** of “contaminated” groundwater into surface water be shown to be “**currently acceptable**” (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented<sup>5</sup>)?

\_\_\_\_\_ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site’s surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR 2) providing or referencing an interim-assessment,<sup>6</sup> appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment “levels,” as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

\_\_\_\_\_ If no - (the discharge of “contaminated” groundwater can not be shown to be “**currently acceptable**”) - skip to #8 and enter “NO” status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

\_\_\_\_\_ If unknown - skip to 8 and enter “IN” status code.

Rationale and Reference(s):

<sup>5</sup> Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

<sup>6</sup> The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

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7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

\_\_\_\_\_ If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

\_\_\_\_\_ If no - enter "NO" status code in #8

\_\_\_\_\_ If unknown - enter "IN" status code in #8.

Rationale and Reference(s):

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8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

  X   YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the at the Former General Motors Corporation Livonia Powertrain facility, EPA ID # MID000718874, located at 12200 Middlebelt Road, Livonia, Wayne County, Michigan. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater." This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

       NO - Unacceptable migration of contaminated groundwater is observed or expected.

       IN - More information is needed to make a determination.

Completed by (signature) [Signature] Date 1/8/14  
(print) Gregory A. Rudloff  
(title) Corrective Action Project Manager

Supervisor (signature) [Signature] Date 1/8/14  
(print) Bradley Grams  
(title) Section Chief (acting)  
(EPA Region or State) Region 5

Locations where References may be found:

*Livonia Civic Center Library*  
32777 5 Mile Road  
Livonia, Michigan 48154  
Attention: Mr. Carl Katafiasz  
(734) 466-2491

*Corrective Action Section #1*  
Remediation and Reuse Branch  
Land and Chemicals Division  
Region 5, U.S. EPA  
Attention: Gregory A. Rudloff  
(312) 886-0455  
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