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ENVIRONMENT

Ms. Jill Groboski
Project Manager
Corrective Action Section
United States Environmental Protection Agency
Region 5
77 West Jackson Boulevard DE-97
Chicago, IL 60604-3590

Subject:
Addendum No. 1 - Resource Conservation and Recovery Act (RCRA)
Revised Corrective Measures Proposal
North American Operations, Flint Operations Site – South of Leith Street
General Motors Corporation, Flint, Michigan
USEPA ID No. MID 005 356 712

Date:
October 15, 2009

Contact:
Derek C. Kaiding, P.E.

Phone:
810.225.1903

Email:
derek.kaiding@arcadis-us.com

Our ref:
B0064410.132#10

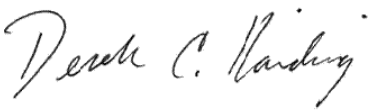
Dear Ms. Groboski:

Enclosed on behalf of the Motors Liquidation Company (MLC, formerly known as General Motors Corporation [GM]) is *Addendum No. 1 - Resource Conservation and Recovery Act (RCRA) Revised Corrective Measures Proposal* for select areas of the GM North American Operations (NAO) Flint Operations Site in Flint, Michigan (United States Environmental Protection Agency [USEPA] ID# 005 356 712). This addendum suggests changes to GM's proposed approach for corrective measures associated with the Areas of Interest (AOIs), located south of Leith Street, which contain subsurface light non-aqueous phase liquid (LNAPL). The information presented herein supplements information provided in GM's Revised Corrective Measures Proposal, dated May 1, 2008 (Revised CPM), and does not otherwise specifically change or supersede information provided in the Revised CPM, with the exception of certain elements pertaining to AOI Group 09-B.

If you have any questions regarding any of these matters, please contact me.

Sincerely,

ARCADIS



Derek C. Kaiding, P.E.
Principal Environmental Engineer

Copies:
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Enclosure:
Addendum No. 1 - Resource Conservation and Recovery Act (RCRA) Revised Corrective Measures Proposal

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ADDENDUM NO. 1 – RESOURCE CONSERVATION AND RECOVERY ACT
REVISED CORRECTIVE MEASURES PROPOSAL
NORTH AMERICAN OPERATIONS, FLINT OPERATIONS – SOUTH OF LEITH STREET
GENERAL MOTORS CORPORATION, FLINT, MICHIGAN
USEPA ID. NO. MID 005 356 712
OCTOBER 15, 2009

1. Introduction

This document has been prepared by ARCADIS on behalf of Motors Liquidation Company (MLC, formerly known as General Motors Corporation [GM]), and pertains to select areas of the site known as GM North American Operations, Flint Operations Site in Flint, Michigan, also referred to as Buick City (the Site). It documents changes to MLC's proposed approach for corrective measures associated with the Areas of Interest (AOIs), located south of Leith Street, which contain subsurface light non-aqueous phase liquid (LNAPL). The information presented herein supplements information provided in GM's *Revised Corrective Measures Proposal*, dated May 1, 2008 (Revised CMP), and does not otherwise specifically change or supersede information provided in the Revised CMP, with the exception of certain elements pertaining to AOI Group 09-B.

Specifically, this document provides the evaluation of remedial alternatives for addressing subsurface LNAPL presence at the following areas, located south of Leith Street:

- AOI Groups 12-A, 12-B, and 12-C
- AOI Group 02-B
- AOI Groups 40-A, 40-B, and 16-C
- AOI Group 09-B

LNAPL presence associated with AOI Group 09-B is evaluated in the Section 14.4 of the Revised CMP; however, such evaluations are supplemented with information provided below. The Revised CMP does not cover such evaluations of LNAPL associated with the remaining areas identified above.

With the exception of conditions at AOI 09-B, the human health risk assessment for these areas (summarized in Section 3.2 of the Revised CMP) indicates that estimates of potential exposure to subsurface LNAPL in these areas do not exceed the United States Environmental Protection Agency's (USEPA's) cumulative cancer risk and HI limits. Additionally, extensive monitoring of all of the LNAPL plumes in these areas, including that of AOI Group 09-B indicates these plumes to be stable with regard to migration (documented in GM's *Resource Conservation and Recovery Act Facility Investigation Phase II Report* [Phase II Report], dated July 14, 2006).

However, in an effort to evaluate additional approaches for controlling these plumes as sources of subsurface contamination in these areas (i.e., providing removal of LNAPL mass), LNAPL presence at

these areas, including AOI Group 09-B, is evaluated below with regard to the following remedial alternatives:

- Additional Institutional Controls above Baseline
- LNAPL-Only Extraction and Additional Institutional Controls above Baseline
- Steam-Enhanced LNAPL Extraction

MLC's evaluation of this portion of the Site is made within the context of potential redevelopment opportunity for the areas of the Site containing the LNAPL areas listed above (areas south of Leith Street), including construction of inter-modal shipping and distribution facilities

2. Condition Descriptions

2.1. Former Building 12 Area – AOI Groups 12-A, 12-B, and 12-C

These AOI groups are associated with the former Building 12, and contain LNAPL that is distributed among three discrete plumes, which are comprised of a comingled mixture of oils, including mostly hydraulic oil. These plumes measure approximately 2,000, 25,000, and 30,000 square feet (SF) in size, respectively, and present LNAPL apparent thicknesses generally less than 6 inches, with a few select wells exhibiting thickness up to approximately 2 feet.

2.2. AOI Group 02-B

This AOI group is associated with the former Building 02, and relates to an elevator pit. LNAPL presence in this area is comprised of a comingled mixture of oils, including mostly hydraulic and fuel oil, and is limited to only one monitoring well. It covers an area of approximately 3,000 SF with an apparent thickness of approximately 6 feet (as measured in the well).

2.3. AOI Group 160-C, 40-A and 40-B

These AOI groups are associated with former Buildings 16 and 40, and collectively relate to an elevator pit, a hydraulic dumpster lift, and several former USTs. LNAPL presence in this area is comprised of a comingled mixture of oils, including mostly hydraulic and fuel oil, and is limited to only a few select monitoring wells. It collectively covers an area of approximately 8,000 SF with an apparent thickness of up to approximately 2.5 feet (as measured in wells).

2.4. AOI Group 09-B

This AOI Group is associated with the Former Building 31/Hamilton Avenue Tank Farm. LNAPL presence in this area is gasoline, and it is limited to only a few select monitoring wells. It collectively covers an area of approximately 5,000 SF with an apparent thickness of up to approximately 3 feet (as measured in wells).

3. Evaluation of Alternatives

3.1. Alternative 1: Additional Institutional Controls above Baseline

3.1.1. Description of Alternative

This alternative involves establishing a deed restriction which would control any future excavations in these areas, such that the current LNAPL migration potential (shown to be nonexistent or de minimis) is not exacerbated, and that any excavated soils are managed appropriately.

3.1.2. Estimated Costs

There is only minimal cost associated with this alternative.

3.1.3. Evaluation Results

This alternative provides adequate protection from potential risk to human health based on the risk assessment included in the RFI Phase II Report; however, it would provide no removal of LNAPL mass associated with these areas.

3.2. Alternative 2: LNAPL-Only Extraction and Additional Institutional Controls above Baseline

3.2.1. Description of Alternative

This alternative includes all of the components of Alternative 1, and additionally involves collecting LNAPL from the subsurface and disposing of the collected LNAPL at an appropriate offsite facility. This alternative would consist of installing one to six LNAPL recovery wells in each of these areas. Submersible pumps designed to collect only LNAPL would be installed in each of these recovery wells. Additionally, oleophilic absorbent socks would be installed in up to one to six existing monitoring wells in each of these areas. All collected LNAPL would be stored in drums or other suitable containers located near the wellheads until sufficient LNAPL is collected to arrange for offsite disposal.

3.2.2. Estimated Costs

The collective capital cost for this alternative is approximately $260,000, while the associated annual implementation costs is approximately $110,000 per year. It is difficult to predict how long the systems would need to operate; however, for purposes of cost estimating, a 30-year period of operation has been assumed. This yields a net present value cost for this alternative of approximately $4,000,000, based on an inflation rate of 3.25% and a discount rate of 2%. (Discount rate assumptions subject to change.)

3.2.3. Evaluation Results

This alternative provides adequate protection from potential risk to human health based on the risk assessment included in the RFI Phase II Report; and would provide additional benefit of removal of LNAPL mass over time for this area.

3.3. Alternative 3: Steam-Enhanced LNAPL Extraction

3.3.1. Description of Alternative

This alternative involves collecting LNAPL from the subsurface and disposing of the collected LNAPL at an appropriate offsite facility. This alternative would consist of installing subsurface a network of steam injection and fluid extraction well fields at a spacing of approximately one well per 250 SF, as well as a high vac fluid removal system, with manifold system and oil/water separation, air stripping, clay/carbon treatment and a discharge to the storm sewer system in this area. All collected LNAPL would be stored in suitable containers in this area until sufficient LNAPL is collected to arrange for offsite disposal. (The actual plume size, well spacing and design of the system will be determined on the basis of further work.)

3.3.2. Estimated Costs

The capital cost for this alternative is approximately $1,530,000; with total implementation costs of approximately $1,020,000 being incurred during years 1 and 2 of implementation. This yields a net present value cost for this alternative of approximately $2,580,000, based on an inflation rate of 3.25% and a discount rate of 2%. (Discount rate assumptions subject to change.)

3.3.3. Evaluation Results

This alternative provides adequate protection from potential risk to human health based on the risk assessment included in the RFI Phase II Report; however, it would provide additional benefit of removal of more LNAPL mass, over a shorter time, for these areas, relative to Alternative 2. Additionally, although this alternative would require a rather short-term and high expenditure of project costs, it would result in a lower total life-cycle cost, relative to Alternative 2.

4. Selected Alternative

The selected alternative for addressing areas of subsurface LNAPL, located south of Leith Street is: Alternative 3: Steam-Enhanced LNAPL Extraction. This is based on the anticipated effectiveness of this alternative, its adequate protection from potential risk to human health, that it would provide removal of LNAPL mass over a very short time for these areas, and that it would result in a lower overall life-cycle cost, relative to Alternative 2.

It is important to note, however, that the resulting overall life-cycle cost comparison between Alternatives 2 and 3 evaluated herein, has only been prepared for the LNAPL areas found south of Leith Street, and that similar conclusions may not result from a comparison of these alternatives when applied to larger LNAPL areas found north of Leith Street. The LNAPL areas evaluated herein are relatively small and shallower than many of the LNAPL areas found north of Leith Street, which would require extensive subsurface infrastructure resulting in prohibitive capital expenditures and high maintenance costs.

Furthermore, the consideration of this approach is based, at least partly, on the opportunity for redevelopment and productive reuse of this area and MLC's objective of enabling economic recovery and job creation. While this alternative is relatively high in energy consumption and green house gas emissions relative to either of the other Alternatives, it is operated for a rather short duration.