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Counsel's Request**

**DRAFT**

**PARCEL A-2  
PHASE III ENVIRONMENTAL SITE ASSESSMENT**

**ADDENDUM NO. 1**

**General Motors Corporation  
Clark Avenue Site  
Detroit, Michigan**

**FEBRUARY 1998  
REF. NO. 8889 (26)**  
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**CONESTOGA-ROVERS & ASSOCIATES**

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## 1.0 INTRODUCTION

Consistent with a request by General Motors Corporation (GM), Conestoga-Rovers & Associates (CRA) has developed the following addendum to the Parcel A-2 Phase III Environmental Site Assessment (Phase III ESA Addendum No. 1) for a portion of the GM Clark Avenue Facility in Detroit, Michigan. The Site is defined as Parcel A-2, as designated on a survey by David C. Adams & Son, dated November 14, 1998 (Site).

This Phase III ESA Addendum No. 1 was developed to address changes in applicable criteria by the Michigan Department of Environmental Quality (MDEQ) - Environmental Response Division (ERD) pursuant to Act 451, Part 201.

This Phase III ESA Addendum No. 1 compares the Phase III ESA analytical data from soil samples collected during the period from September 1996 through February 1997, to the following criteria:

- Direct Contact Criteria;
- Soil Saturation Criteria;
- Ambient Air; and
- Indoor Air.

2.0 ANALYTICAL RESULTS

The location and number of soil samples collected is described in the Phase III ESA Report. Table 2.1 presents a summary of detected compounds in soil samples. Soil samples were collected and analyzed for benzene, toluene, ethylbenzene and xylenes (BTEX). No BTEX parameters were detected above the most restrictive industrial soil criteria.

**3.0 CONCLUSIONS**

Based on the results of the Phase III ESA for the Site and the re-evaluation of the data with respect to the revised industrial criteria presented in this addendum, the approximate extent of impacted soil at AOC A2-1 has been delineated, as presented on Figure 3.1.

TABLE 2.1

SUMMARY OF DETECTED BTEX IN SOIL SAMPLES  
PHASE II ESA ADDENDUM NO. 1  
PARCEL A-2  
GM CLARK AVENUE FACILITY  
DETROIT, MICHIGAN

| PAOC No.                                  | Michigan<br>Generic Residential<br>Direct Contact<br>Criteria (1) | Michigan<br>Generic Industrial<br>Direct Contact<br>Criteria (2) | Soil Saturation<br>(Csat)(4) | Residential<br>Ambient Air<br>Finite Source<br>(5 m) VSIC (3) | Industrial/Commercial<br>Ambient Air<br>Finite Source<br>(5 m) VSIC (3) | Residential<br>Volatilization to<br>Indoor Air Inhalation<br>Criteria (4) | Industrial/Commercial<br>Volatilization to<br>Indoor Air Inhalation<br>Criteria (4) | A2-1<br>BH-170-96<br>101696-PFR-255<br>6-7<br>10/16/96 |
|-------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------------------|------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------|---------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------|
| Sample Location                           |                                                                   |                                                                  |                              |                                                               |                                                                         |                                                                           |                                                                                     |                                                        |
| Sample ID (S-8889-)                       |                                                                   |                                                                  |                              |                                                               |                                                                         |                                                                           |                                                                                     |                                                        |
| Sample Depth (feet bgs)                   |                                                                   |                                                                  |                              |                                                               |                                                                         |                                                                           |                                                                                     |                                                        |
| Date Sampled                              |                                                                   |                                                                  |                              |                                                               |                                                                         |                                                                           |                                                                                     |                                                        |
| Parameter                                 |                                                                   |                                                                  |                              |                                                               |                                                                         |                                                                           |                                                                                     |                                                        |
| <u>Volatile Organic Compounds (ug/kg)</u> |                                                                   |                                                                  |                              |                                                               |                                                                         |                                                                           |                                                                                     |                                                        |
| Benzene                                   | 88,000                                                            | 850,000                                                          | 410,000                      | 16,500                                                        | 47,500                                                                  | 1,600                                                                     |                                                                                     | 4,700 J                                                |
| Ethylbenzene                              | 11,000,000                                                        | 72,000,000                                                       | 140,000                      | 3,350,000                                                     | 13,000,000                                                              | 1,100,000                                                                 |                                                                                     | 24,000 J                                               |
| Toluene                                   | 24,000,000                                                        | 160,000,000                                                      | 750,000                      | 2,450,000                                                     | 5,000,000                                                               | 330,000                                                                   |                                                                                     | 32,000 J                                               |
| Xylenes                                   | 200,000,000                                                       | 1,000,000,000                                                    | 130,000                      | 28,500,000                                                    | 60,000,000                                                              | 6,300,000                                                                 | 12,000,000                                                                          | 95,000 J                                               |

## Notes:

ND( ) - Parameter was not detected above level in parenthesis.

J - The associated numerical value is an estimated quantity.

U( ) - The analyte was analyzed for, but was not detected above the reported sample quantitation limit in parenthesis.

UJ - The analyte was not detected above the reported sample quantitation limit.

ID - Insufficient data to develop criterion.

PAOC - Potential Area of Concern.

bgs - below ground surface.

Shaded number indicates most restrictive industrial criterion.

(1) Values taken from MDEQ Operational Memorandum #8, Revision 4, dated June 5, 1995.

(2) Values taken from MDEQ Operational Memorandum #14, Revision 2, dated June 6, 1995.

(3) Values taken from MDEQ-ERD Part 201 Generic Soil Inhalation Criteria for Ambient Air: Technical Support Document, dated April 23, 1997 (Modifier of 0.5 used for 13-acre parcel).

(3) Values taken from MDEQ-ERD Draft Part 201 Generic Groundwater and Soil Volatilization to Indoor Air Criteria: Technical Support Document, dated December 21, 1997.

TABLE 2.1

SUMMARY OF DETECTED BTEX IN SOIL SAMPLES  
 PHASE II ESA ADDENDUM NO. 1  
 PARCEL A-2  
 GM CLARK AVENUE FACILITY  
 DETROIT, MICHIGAN

| PAOC No.<br>Sample Location<br>Sample ID (S-8889-)<br>Sample Depth (feet bgs)<br>Date Sampled | A2-1<br>BH-170-96<br>101696-PFR-256<br>6-7 (Dup.)<br>10/16/96 | A2-1<br>BH-170-96<br>101696-PFR-257<br>11-12<br>10/16/96 | A2-1<br>BH-171-96<br>101696-PFR-258<br>5.5-6.5<br>10/16/96 | A2-1<br>BH-171-96<br>101696-PFR-259<br>8.5-9<br>10/16/96 | A2-1<br>BH-172-96<br>101696-PFR-260<br>6.5-7<br>10/16/96 | A2-1<br>BH-172-96<br>101696-PFR-261<br>10.5-11<br>10/16/96 | A2-1<br>BH-173-96<br>101696-PFR-262<br>6-7<br>10/16/96 | A2-1<br>BH-173-96<br>101696-PFR-263<br>11-12<br>10/16/96 |
|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------------|------------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|------------------------------------------------------------|--------------------------------------------------------|----------------------------------------------------------|
| Parameter                                                                                     |                                                               |                                                          |                                                            |                                                          |                                                          |                                                            |                                                        |                                                          |
| <u>Volatile Organic Compounds (µg/l)</u>                                                      |                                                               |                                                          |                                                            |                                                          |                                                          |                                                            |                                                        |                                                          |
| Benzene                                                                                       | 3,200 J                                                       | ND(10)                                                   | ND(10)                                                     | ND(10) UJ                                                | 160 J                                                    | ND(10) UJ                                                  | ND(10) R                                               | ND(10) UJ                                                |
| Ethylbenzene                                                                                  | 21,000 J                                                      | ND(10)                                                   | ND(10)                                                     | ND(10) UJ                                                | 1,100 J                                                  | ND(10) UJ                                                  | ND(10) R                                               | ND(10) UJ                                                |
| Toluene                                                                                       | 25,000 J                                                      | ND(10)                                                   | ND(10)                                                     | ND(10) UJ                                                | 220 J                                                    | ND(10) UJ                                                  | ND(10) R                                               | ND(10) UJ                                                |
| Xylenes                                                                                       | 86,000 J                                                      | ND(30)                                                   | ND(30)                                                     | ND(30) UJ                                                | 3,200 J                                                  | ND(30) UJ                                                  | ND(30) R                                               | ND(30) UJ                                                |



TABLE 2.1

## SUMMARY OF DETECTED BTEX IN SOIL SAMPLES

## PHASE II ESA ADDENDUM NO. 1

## PARCEL A-2

## GM CLARK AVENUE FACILITY

## DETROIT, MICHIGAN

| PAOC No.                                 | A2-1           | A2-1           | A2-1           | A2-1           | A2-1           | A2-1           | A2-1           | A2-1           | A2-1           | A2-1           | A2-1           | A2-1           |
|------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Sample Location                          | BH-174-96      | BH-174-96      | BH-175-96      | BH-176-96      | BH-176-96      | BH-176-96      | BH-177-96      | BH-177A-96     | BH-177A-96     | BH-177A-96     | BH-177A-96     | BH-177A-96     |
| Sample ID (S-8889-)                      | 101796-PFR-264 | 101796-PFR-265 | 101796-PFR-267 | 101796-PFR-268 | 101796-PFR-268 | 101796-PFR-269 | 101796-PFR-271 | 101796-PFR-272 | 101796-PFR-272 | 101796-PFR-273 | 101796-PFR-273 | 101796-PFR-273 |
| Sample Depth (feet bgs)                  | 11-12          | 15.5-16        | 13-14          | 4-5            | 4-5            | 10.5-11        | 9-11           | 3.5-4.5        | 3.5-4.5        | 7.5-8          | 7.5-8          | 7.5-8          |
| Date Sampled                             | 10/17/96       | 10/17/96       | 10/17/96       | 10/17/96       | 10/17/96       | 10/17/96       | 10/17/96       | 10/17/96       | 10/17/96       | 10/17/96       | 10/17/96       | 10/17/96       |
| Parameter                                |                |                |                |                |                |                |                |                |                |                |                |                |
| <u>Volatile Organic Compounds (ug/l)</u> |                |                |                |                |                |                |                |                |                |                |                |                |
| Benzene                                  | ND(12)         | ND(13) UJ      | ND(12) UJ      | ND(15)         | ND(12)         | ND(12)         | ND(125)        | ND(14)         | ND(14)         | ND(12)         | ND(12)         | ND(12)         |
| Ethylbenzene                             | ND(12)         | ND(13) UJ      | ND(12) UJ      | 20 J           | ND(12)         | ND(12)         | 460            | ND(14)         | ND(14)         | ND(12)         | ND(12)         | ND(12)         |
| Toluene                                  | ND(12)         | ND(13) UJ      | ND(12) UJ      | ND(15)         | ND(12)         | ND(12)         | 200            | ND(14)         | ND(14)         | ND(12)         | ND(12)         | ND(12)         |
| Xylenes                                  | ND(36)         | ND(39) UJ      | ND(36) UJ      | 74 J           | ND(37)         | ND(37)         | 1,100          | ND(42)         | ND(42)         | ND(37)         | ND(37)         | ND(37)         |

TABLE 2.1

SUMMARY OF DETECTED BTEX IN SOIL SAMPLES  
 PHASE II ESA ADDENDUM NO. 1  
 PARCEL A-2  
 GM CLARK AVENUE FACILITY  
 DETROIT, MICHIGAN

| PAOC No.                                 | A2-1           | A2-1           | A2-1           | A2-1           | A2-1           | A2-1           | A2-1           | A2-1           | A2-1           | A2-1           | A2-1           |
|------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Sample Location                          | BH-178-96      | BH-179-96      | BH-180-96      | BH-180-96      | BH-181-96      | BH-181-96      | BH-181-96      | BH-181-96      | BH-181-96      | BH-181-96      | BH-182-96      |
| Sample ID (S-8889-)                      | 101796-PFR-275 | 101896-PFR-276 | 101896-PFR-277 | 101896-PFR-278 | 101896-PFR-279 | 101896-PFR-280 | 101896-PFR-281 | 101896-PFR-282 | 101896-PFR-283 | 101896-PFR-284 | 101896-PFR-285 |
| Sample Depth (feet bgs)                  | 13.5-14        | 6-7            | 14-15          | 3-4            | 8-9            | 6-7            | 10.5-11        | 5.5-6.5        | 5.5-6.5        | 5.5-6.5        | 5.5-6.5        |
| Date Sampled                             | 10/17/96       | 10/18/96       | 10/18/96       | 10/18/96       | 10/18/96       | 10/18/96       | 10/18/96       | 10/18/96       | 10/18/96       | 10/18/96       | 10/18/96       |
| Parameter                                |                |                |                |                |                |                |                |                |                |                |                |
| <u>Volatile Organic Compounds (µg/l)</u> |                |                |                |                |                |                |                |                |                |                |                |
| Benzene                                  | ND(13) UJ      | 3,600 J        | ND(12)         | 24             | 36             | ND(13)         | ND(12)         | ND(12)         | ND(12)         | ND(12)         | 3,500 J        |
| Ethylbenzene                             | ND(13) UJ      | 6,300 J        | ND(12)         | ND(10)         | ND(12)         | ND(13)         | ND(12)         | ND(12)         | ND(12)         | ND(12)         | 14,000 J       |
| Toluene                                  | ND(13) UJ      | 7,300 J        | ND(12)         | ND(10)         | ND(12)         | ND(13)         | ND(12)         | ND(12)         | ND(12)         | ND(12)         | 11,000 J       |
| Xylenes                                  | ND(39) UJ      | 13,000 J       | ND(36)         | ND(30)         | 38             | ND(37)         | ND(36)         | ND(36)         | ND(36)         | ND(36)         | 46,000 J       |

TABLE 2.1

SUMMARY OF DETECTED BTEX IN SOIL SAMPLES  
 PHASE II ESA ADDENDUM NO. 1  
 PARCEL A-2  
 GM CLARK AVENUE FACILITY  
 DETROIT, MICHIGAN

| PAOC No.                                 | A2-1           | A2-1           | A2-1           | A2-1           | A2-1           | A2-1           | A2-1           | A2-1           | A2-1           | A2-1           | A2-1           |
|------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Sample Location                          | BH-182-96      | BH-182-96      | BH-183-96      | BH-183-96      | BH-184-96      | BH-184-96      | BH-184-96      | BH-184-96      | BH-184-96      | BH-186B-96     | BH-186B-96     |
| Sample ID (S-8889-)                      | 101896-PFR-283 | 101896-PFR-284 | 101896-PFR-285 | 101896-PFR-286 | 101896-PFR-287 | 101896-PFR-288 | 101896-PFR-289 | 101896-PFR-289 | 101896-PFR-289 | 102196-PFR-290 | 102196-PFR-290 |
| Sample Depth (feet bgs)                  | 5.5-6.5 (Dup.) | 10.5-11.5      | 3-4            | 8.5-9          | 5-5.75         | 9.75-11        | 5-6            | 5-6            | 5-6            | 11-12          | 11-12          |
| Date Sampled                             | 10/18/96       | 10/18/96       | 10/18/96       | 10/18/96       | 10/21/96       | 10/21/96       | 10/21/96       | 10/21/96       | 10/21/96       | 10/21/96       | 10/21/96       |
| Parameter                                |                |                |                |                |                |                |                |                |                |                |                |
| <u>Volatile Organic Compounds (µg/l)</u> |                |                |                |                |                |                |                |                |                |                |                |
| Benzene                                  | 2,400 J        | ND(14) UJ      | ND(12) UJ      | ND(12) UJ      | ND(12) UJ      | ND(12) UJ      | ND(12) UJ      | ND(12) UJ      | ND(12) UJ      | ND(12) UJ      | ND(12) UJ      |
| Ethylbenzene                             | 10,000 J       | 38 J           | ND(12) UJ      | ND(12) UJ      | ND(12) UJ      | ND(12) UJ      | ND(12) UJ      | ND(12) UJ      | ND(12) UJ      | ND(12) UJ      | ND(12) UJ      |
| Toluene                                  | 9,000 J        | 30 J           | ND(12) UJ      | ND(12) UJ      | ND(12) UJ      | ND(12) UJ      | ND(12) UJ      | ND(12) UJ      | ND(12) UJ      | ND(12) UJ      | ND(12) UJ      |
| Xylenes                                  | 36,000 J       | 180 J          | ND(36) UJ      | ND(36) UJ      | ND(35) UJ      | ND(35) UJ      | ND(35) UJ      | ND(35) UJ      | ND(35) UJ      | ND(35) UJ      | ND(35) UJ      |

TABLE 2.1

SUMMARY OF DETECTED BTEX IN SOIL SAMPLES  
 PHASE II ESA ADDENDUM NO. 1  
 PARCEL A-2  
 GM CLARK AVENUE FACILITY  
 DETROIT, MICHIGAN

| PAOC No.                                 | A2-1           | A2-1           | A2-1           | A2-1           | A2-1           | A2-1           | A2-1           | A2-1           | A2-1           | A2-1           |
|------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Sample Location                          | BH-185A-96     | BH-187C-96     | BH-187C-96     | BH-188-96      | BH-188-96      | BH-188-96      | BH-188-96      | BH-188-96      | BH-175R-96     | BH-175R-96     |
| Sample ID (S-8889-)                      | 102296-PFR-291 | 102296-PFR-292 | 102296-PFR-293 | 102296-PFR-294 | 102296-PFR-295 | 102296-PFR-296 | 102296-PFR-297 | 102296-PFR-298 | 102296-PFR-297 | 102296-PFR-298 |
| Sample Depth (feet bgs)                  | 8-10           | 25-27          | 4-5            | 9.5-10         | 3-5            | 11.5-12        | 5-7            | 11.5-12        | 5-7            | 11.5-12        |
| Date Sampled                             | 10/22/96       | 10/22/96       | 10/22/96       | 10/22/96       | 10/22/96       | 10/22/96       | 10/22/96       | 10/22/96       | 10/22/96       | 10/22/96       |
| Parameter                                |                |                |                |                |                |                |                |                |                |                |
| <u>Volatile Organic Compounds (µg/l)</u> |                |                |                |                |                |                |                |                |                |                |
| Benzene                                  | ND(12)         | ND(12)         | ND(11)         | ND(13)         | ND(290)        | 54             | 600 J          | ND(12) UJ      |                |                |
| Ethylbenzene                             | ND(12)         | ND(12)         | ND(11)         | ND(13)         | 3,600 J        | ND(13)         | 1,500 J        | ND(12) UJ      |                |                |
| Toluene                                  | ND(12)         | ND(12)         | ND(11)         | ND(13)         | 4,300 J        | 32             | 890 J          | ND(12) UJ      |                |                |
| Xylenes                                  | ND(37)         | ND(36)         | ND(30)         | ND(39)         | 13,000 J       | 25             | 3,300 J        | ND(36) UJ      |                |                |

TABLE 2.1

SUMMARY OF DETECTED BTEX IN SOIL SAMPLES  
 PHASE II ESA ADDENDUM NO. 1  
 PARCEL A-2  
 GM CLARK AVENUE FACILITY  
 DETROIT, MICHIGAN

|                                          |                |                |                |
|------------------------------------------|----------------|----------------|----------------|
| PAOC No.                                 | A2-1           | A2-1           | A2-1           |
| Sample Location                          | BH-178R-96     | BH-178R-96     | BH-178R-96     |
| Sample ID (S-8889-)                      | 102296-PFR-299 | 102296-PFR-308 | 102296-PFR-309 |
| Sample Depth (feet bgs)                  | 6-7            | 6-7 (Dup.)     | 13.5-14        |
| Date Sampled                             | 10/22/96       | 10/22/96       | 10/22/96       |
| Parameter                                |                |                |                |
| <u>Volatile Organic Compounds (ug/l)</u> |                |                |                |
| Benzene                                  | ND(160) J      | ND(160) UJ     | ND(13) UJ      |
| Ethylbenzene                             | 320 UJ         | 360 J          | ND(13) UJ      |
| Toluene                                  | 210 UJ         | 240 J          | ND(13) UJ      |
| Xylenes                                  | 1,100 UJ       | 1,200 J        | ND(38) UJ      |

