HARRISON

Harrison Division
General Motors Corporation
200 Upper Mountain Road
Lockport, New York 14094

11-Jan-94

Mr. Stan Radon
New York State of Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203

Dear Mr. Radon:

Enclosed is the quarterly groundwater monitoring report for December 1993. The report form indicates the sample date, the groundwater elevations, and the as-analyzed concentration of certain parameters.

The parameter and sample point data have been modified to reflect the changes summarized in Harrison correspondance dated August 3, 1993 and accepted in New York State Department of Environmental Conservation correspondance dated August 18, 1993.

Sample collection and on-site analyses for pH, specific conductance, and temperature were performed by GZA GeoEnvironmental of New York. All other analyses were by Free-Col Laboratories, Inc. in Meadville, Pennsylvania.

If you have any questions regarding this or subsequent monitoring reports, please contact Cathy Ver at 439-2942.

Sincerely,

Roy D Knapp

Roy D. Knapp
Supervisor -
Environmental Activities

cc: Mr. P. Counterman - NYSDEC, Albany
Mr. J. DeVald - NCHD

QUARTERLY GROUNDWATER MONITORING REPORT

HARRISON DIVISION, GMC
LOCKPORT, NY 14094

SAMPLE DATE: 01-Dec-93

REPORT DATE: 11-Jan-94

BEDROCK WELL ID #	I-1R	I-2R	I-5R	I-6R	I-7R	TRIP BLANK
Water Elev, (feet)	624.7	624.6	612.8	612.1	612.4	N.A.
Specific Cond. (uMHOS/cm)	840	800	1720	950	990	N.A.
pH (standard units)	7.0	7.1	6.7	6.9	7.2	N.A.
Temperature (degree C)	12.6	14.1	12.7	14.1	14.1	N.A.
Chromium, Total	0.001	0.002	<0.001	0.005	0.001	<0.001
Zinc, Total	0.710	<0.005	0.020	0.212	<0.005	0.005

					% MATRIX RECOVERY	
TOP OF ROCK WELL ID #	I-1T	I-2T	I-5T	I-7T	SPIKE I-2R	DUPLICATE I-2R
Water Elev, (feet)	624	623.7	613	613.6	N.A.	N.A.
Specific Cond. (uMHOS/cm)	1000	760	2890	820	N.A.	N.A.
pH (standard units)	7	7.1	7.0	7.2	N.A.	N.A.
Temperature (degree C)	8.8	7.2	11.4	11.5	N.A.	N.A.
Chromium, Total	0.002	0.002	0.015	0.001	91	93
Zinc, Total	0.024	0.029	0.137	0.007	104	105

OBSERVATION WELL ID #	II-AR	II-AT	II-BT	II-CT	II-DR	II-DT	I-3R	I-4R	I-3T	I-4T
Water Elev, (feet)	617.3	617.1	619.9	619.0	615.9	617.0	617.7	612.9	617.7	615.5

NOTES:

1) Groundwater elevation expressed in feet above mean sea level.
2) Specific conductance expressed in uMHOS/cm at 25 degrees C.
3) Metals expressed in mg/L.
4) < Denotes concentration as analyzed was below detection limit.
5) Monitoring at Wells II-AR, II-AT, II-BT, II-CT, II-DR, and II-DT is for water elevation only.
6) * Denotes erratic spike dulicate results. See lab report.
7) Wells I-3R, I-3T, I-4R, I-4T only water elevation is collected.

GZA
GeoEnvironmental
of New York

Engineers and
Scientists

December 7, 1993
File: 5805

Ms. Catherine Ver
Harrison, Division of
General Motors Corporation
200 Upper Mountain Road
Lockport, New York 14094

Re: Long-Term Groundwater Monitoring
Field Measurements and Equipment
Calibration Records

364 Nagel Drive
Buffalo, New York
14225
716-685-2300
FAX 716-685-3629

Dear Ms. Ver:

Enclosed is a summary of groundwater field measurements, equipment calibration measurements and a copy of the chain-of-custody form completed by GZA GeoEnvironmental of New York (GZA) during the sampling event of November 30 and December 1, 1993. Nine wells were sampled as part of the monitoring program including I-1T, I-1R, I-2T, I-2R, I-5T, I-5R, I-6R, I-7T and I-7R. Each sample was submitted to Free-Col Laboratories, Inc. for sampling of chromium and zinc.

The water levels in all I- and II-series wells were measured and I-1T, I-2T and I-7T were purged on November 30, 1993. The remaining wells included in the monitoring program were purged and the nine wells specified above were sampled on December 1, 1993.

The matrix spike/matrix spike duplicate sample for this round was collected from I-2R. Additionally, a trip blank was prepared by Free-Col Laboratories and accompanied the samples during the sample round.

If you have any questions or require additional information, please do not hesitate to contact the undersigned.

Very truly yours,

GZA GEOENVIRONMENTAL OF NEW YORK

Stephen H. Blair
Project Engineer

Enclosure

Summary of In-Situ Field Measurements

Project: Harrison Facility Groundwater Monitoring Program	GZA File: R5805.00
Location: Lockport, New York	Sample Collection Date: December 1, 1993

Group 1: Bedrock Monitoring Wells

Sample Location	Sample Date	Water Elevation (feet)	pH (Standard Units)	Specific Conductance (uMHOS/cm)	Temp. (C)	Turbidity (NTU)
I-1R	12/1/93	624.7	7.0	840	12.6	8
I-2R	12/1/93	624.6	7.1	800	14.1	3
I-5R	12/1/93	612.8	6.7	1720	12.7	5
I-6R	12/1/93	612.1	6.9	950	14.1	3
I-7R	12/1/93	612.4	7.2	990	14.1	4

Group 2: Top of Rock Monitoring Wells

Sample Location	Sample Date	Water Elevation (feet)	pH (Standard Units)	Specific Conductance (uMHOS/cm)	Temp. (C)	Turbidity (NTU)
I-1T	12/1/93	624.0	7.0	1000	8.8	20
I-2T	12/1/93	623.7	7.1	760	7.2	25
I-5T	12/1/93	613.0	7.0	2890	11.4	22
I-7T	12/1/93	613.6	7.2	820	11.5	8

Group 3: Groundwater Observation Wells

Sample Location	Sample Date	Water Elevation (feet)		Sample Location	Sample Date	Water Elevation (feet)
I-3T	11/30/93	617.7		II-AR	11/30/93	617.3
I-3R	11/30/93	617.7		II-BT	11/30/93	619.9
I-4T	11/30/93	615.5		II-CT	11/30/93	619.0
I-4R	11/30/93	612.9		II-DR	11/30/93	615.9
II-AT	11/30/93	617.1		II-DT	11/30/93	617.0

GZA GeoEnvironmental of New York

Note: All groundwater elevations measured on 11/30/93

pH METER CALIBRATION WORKSHEET

Project: Harrison Facility Groundwater Monitoring Program	**GZA File:** R5805.00
Location: Lockport, New York	**Sample Collection Date:** December 1, 1993

Thermometer Model: Extech pH–T Meter with Corning calomel combination electrode

Calibration (1)

Date	Set Points (2) (pH units)	Target (3) Value (pH units)	Actual (4) Reading (pH units)	Analyst's Initials	Remarks
11/30/93	4.00 10.00	7.00	7.01	SHB	Two point calibration in GZA laboratory prior to sampling event.
12/1/93	4.00 10.00	7.00	6.99	SHB	Two point calibration in field prior to sampling event.

Notes:

(1) These calibrations were done in accordance with the NYSDOH's Environmental Laboratory Approval Program (ELAP manual, item 231 revised as of April 1, 1986.

(2) For a one point calibration, the set point is the pH of the standard buffer solution used to initially calibrate the pH meter. For a two point calibration, the set points are the pH of the standard buffers used to initially calibrate the slope of the pH meter.

(3) For a one point calibration, the target values are the pH of the standard buffers used to check the slope of the pH meter. For a two point calibration, the target value is the pH of the standard buffer used to check the initial calibration.

(4) The accepted accuacy for the actual readings using a one point calibration is +/– 0.2 pH units of the target value. The acepted accuracy for the actual reading using a two point calibration is +/– 0.05 pH units of the target value.

CONDUCTIVITY METER CALIBRATION WORKSHEET

Project: Harrison Facility Groundwater Monitoring Program	**GZA File:** R5805.00
Location: Lockport, New York	**Sample Collection Date:** December 1, 1993

Thermometer Model: Extech C–T Meter S/N 2–1640 (B)

Calibration (1)

Date	Temperature (C)	Target (2) Value (uMHOS/cm)	Actual (3) Reading (uMHOS/cm)	Analyst's Initials	Remarks
11/30/93	23	1419	1417	SHB	Calibrated in GZA laboratory prior to sampling event using 0.01 N KCL solution.
11/30/93	23	147	147	SHB	Calibrated in GZA laboratory prior to sampling event using 0.001 N KCL solution.
12/1/93	20	150	147	SHB	Calibrated in field prior to sampling using 0.001 N KCL solution.

Notes:

(1) These calibrations were done in accordance with the NYSDOH's Environmental Laboratory Approval Program (ELAP manual, item 231 revised as of April 1, 1986.

(2) Target value is the concentration of the potassium chloride (KCL) standard solution.

(3) Accepted accuracy for the actual reading is +/– 20 percent of the target value.

THERMOMETER CALIBRATION WORKSHEET

Project: Harrison Facility Groundwater Monitoring Program	**GZA File:** R5805.00
Location: Lockport, New York	**Sample Collection Date:** December 1, 1993

Thermometer Model: Extech C–T Meter S/N 2–1640 (B)

Calibration (1)

Date	Target Temperature (C)	Observed Temperature (C)	Analyst's Initials	Remarks
12/1/93	3.2 16.2 30.8 40.4	3.2 15.4 30.6 40.1	SHB	See Note 4.

Notes:

(1) These calibrations were done in accordance with the NYSDOH's Environmental Laboratory Approval Program (ELAP manual, item 231 revised as of April 1, 1986.

(2) Target temperature is the temperature reading of the National Bureau of Standards (NBS) traceable thermometer. The NBS thermometer was certified on July 11, 1985 and checked at the ice point on Setember 19, 1988.

(3) Actual temperature is the temperature of the calibrated thermometer.

(4) The correction factor of the calibrated thermometer is:

Corrected Temperature = 0.99 X Actual Temperature + 0.75

TURBIDOMETER CALIBRATION WORKSHEET

Project: Harrison Facility Groundwater Monitoring Program	**GZA File:** R5805.00
Location: Lockport, New York	**Sample Collection Date:** December 1, 1993

Turbidometer Model: Cole Parmer Model 8391 – 85

Calibration (1)

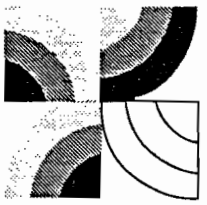
Date	Target Value (NTU)	Observed Value (NTU)	Analyst's Initials	Remarks
12/1/93	40	40	SHB	Measured in field prior to sampling event.

Notes:

(1) These calibrations were done in accordance with the NYSDOH's Environmental Laboratory Approval Program (ELAP manual, item 231 revised as of April 1, 1986.

(2) Target value of primary AMCO–AEPA–1 standards

FREE-COL LABORATORIES, INC.
P.O. Box 557, Cotton Road
Meadville, Pennsylvania 16335-0557
Phone: Area Code 814/724-6242
FAX Area Code 814/333-1466

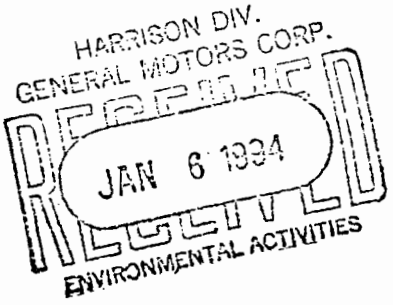


ENVIRONMENTAL
OCCUPATIONAL HEALTH
FOOD SCIENCE
SPECIALISTS

HARRISON DIVISION
GENERAL MOTORS CORPORATION

ROAD 7 QUARTERLY MONITORING

SAMPLE DATE: 12/01/93
P.O.# H-55864



FREE-COL LABORATORIES, INC.

P.O. BOX 557,COTTON ROAD
MEADVILLE, PENNSYLVANIA 16335
PHONE: (814) 724-6242
FAX: (814) 333-1466

5815 AIRPORT ROAD
ROANOKE, VIRGINIA 24012
PHONE: (703) 265-2544
FAX: (703) 362-1663

12/09/93

TO: HARRISON DIVISION GMC
ATTN: MS. CATHERINE VER
200 UPPER MOUNTAIN RD.
LOCKPORT NY 14094

P.O. # H-55864

ACCOUNT NO. 01220

ANALYTICAL REPORT FORM

LAB ID	SAMPLE ID		PARAMETER	RESULT
31202420	I-1T	12/01/93	ACID DIGESTION PREP	COMPLETE
31202421	I-1R	12/01/93	ACID DIGESTION PREP	COMPLETE
31202422	I-2T	12/01/93	ACID DIGESTION PREP	COMPLETE
31202423	I-2R	12/01/93	ACID DIGESTION PREP	COMPLETE
31202424	I-5T	12/01/93	ACID DIGESTION PREP	COMPLETE
31202425	I-5R	12/01/93	ACID DIGESTION PREP	COMPLETE
31202426	I-6R	12/01/93	ACID DIGESTION PREP	COMPLETE
31202427	I-7T	12/01/93	ACID DIGESTION PREP	COMPLETE
31202428	I-7R	12/01/93	ACID DIGESTION PREP	COMPLETE
31202429	TRIP BLANK	11/30/93	ACID DIGESTION PREP	COMPLETE

Acid Digestion Prep - Method - 3005A

"Test Methods for Evaluating Solid Waste: Physical/Chemical Methods", SW-846, Third Edition, U.S. Environmental Protection Agency. Revised 1986.

DATE AND	ANALYST
12/03/93	MAIN

FREE-COL LABORATORIES, INC.

P.O. BOX 557,COTTON ROAD
MEADVILLE, PENNSYLVANIA 16335
PHONE: (814) 724-6242
FAX: (814) 333-1466

5815 AIRPORT ROAD
ROANOKE, VIRGINIA 24012
PHONE: (703) 265-2544
FAX: (703) 362-1663

12/09/93

TO:
HARRISON DIVISION GMC
ATTN: MS. CATHERINE VER
200 UPPER MOUNTAIN RD.
LOCKPORT NY 14094

P.O. # H-55864

ACCOUNT NO. 01220

ANALYTICAL REPORT FORM

LAB ID	SAMPLE ID			PARAMETER	RESULT
31202430	I-1T	12/01/93	DIGESTION	ZINC MG/L	0.024
31202431	I-1R	12/01/93	DIGESTION	ZINC MG/L	0.710
31202432	I-2T	12/01/93	DIGESTION	ZINC MG/L	0.029
31202433	I-2R	12/01/93	DIGESTION	ZINC MG/L	<0.005
31202434	I-5T	12/01/93	DIGESTION	ZINC MG/L	0.137
31202435	I-5R	12/01/93	DIGESTION	ZINC MG/L	0.020
31202436	I-6R	12/01/93	DIGESTION	ZINC MG/L	0.212
31202437	I-7T	12/01/93	DIGESTION	ZINC MG/L	0.007
31202438	I-7R	12/01/93	DIGESTION	ZINC MG/L	<0.005
31202439	TRIP BLANK	11/30/93	DIGESTION	ZINC MG/L	0.005

Zinc - Method - 7950

"Test Methods for Evaluating Solid Waste: Physical/Chemical Methods", SW-846, Third Edition, U.S. Environmental Protection Agency. Revised 1986.

DATE AND ANALYST
12/07/93 PRUTZMAN

FREE-COL LABORATORIES, INC.

P.O. BOX 557,COTTON ROAD
MEADVILLE, PENNSYLVANIA 16335
PHONE: (814) 724-6242
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5815 AIRPORT ROAD
ROANOKE, VIRGINIA 24012
PHONE: (703) 265-2544
FAX: (703) 362-1663

12/09/93

TO: HARRISON DIVISION GMC
ATTN: MS. CATHERINE VER
200 UPPER MOUNTAIN RD.
LOCKPORT NY 14094

P.O. # H-55864

ACCOUNT NO. 01220

ANALYTICAL REPORT FORM

LAB ID	SAMPLE ID			PARAMETER	RESULT
31202430	I-1T	12/01/93	DIGESTION	CHROMIUM G.F. MG/L	0.002
31202431	I-1R	12/01/93	DIGESTION	CHROMIUM G.F. MG/L	0.001
31202432	I-2T	12/01/93	DIGESTION	CHROMIUM G.F. MG/L	0.002
31202433	I-2R	12/01/93	DIGESTION	CHROMIUM G.F. MG/L	0.002
31202434	I-5T	12/01/93	DIGESTION	CHROMIUM G.F. MG/L	0.015
31202435	I-5R	12/01/93	DIGESTION	CHROMIUM G.F. MG/L	<0.001
31202436	I-6R	12/01/93	DIGESTION	CHROMIUM G.F. MG/L	0.005
31202437	I-7T	12/01/93	DIGESTION	CHROMIUM G.F. MG/L	0.001
31202438	I-7R	12/01/93	DIGESTION	CHROMIUM G.F. MG/L	0.001
31202439	TRIP BLANK	11/30/93	DIGESTION	CHROMIUM G.F. MG/L	<0.001

Chromium - Method - 7191

"Test Methods for Evaluating Solid Waste: Physical/Chemical Methods", SW-846, Third Edition, U.S. Environmental Protection Agency. Revised 1986.

DATE AND	ANALYST
12/06/93	BAKER

FREE-COL LABORATORIES, INC.

P.O. BOX 557,COTTON ROAD
MEADVILLE, PENNSYLVANIA 16335
PHONE: (814) 724-6242
FAX: (814) 333-1466

5815 AIRPORT ROAD
ROANOKE, VIRGINIA 24012
PHONE: (703) 265-2544
FAX: (703) 362-1663

12/09/93

TO:
HARRISON DIVISION GMC
ATTN: MS. CATHERINE VER
200 UPPER MOUNTAIN RD.
LOCKPORT NY 14094-1896

P.O. # H-55864

ACCOUNT NO. 01220

ANALYTICAL REPORT FORM

LAB ID	SAMPLE ID			PARAMETER	RESULT
31202440	MATRIX SPK	I-2R	% RECOVERY	ACID DIGESTION PREP	COMPLETE
31202441	MATRIX DUP	I-2R	% RECOVERY	ACID DIGESTION PREP	COMPLETE

DATE AND ANALYST
12/03/93 MAIN

FREE-COL LABORATORIES, INC.

P.O. BOX 557,COTTON ROAD
MEADVILLE, PENNSYLVANIA 16335
PHONE: (814) 724-6242
FAX: (814) 333-1466

5815 AIRPORT ROAD
ROANOKE, VIRGINIA 24012
PHONE: (703) 265-2544
FAX: (703) 362-1663

12/09/93

TO: HARRISON DIVISION GMC
ATTN: MS. CATHERINE VER
200 UPPER MOUNTAIN RD.
LOCKPORT NY 14094-1896

P.O. # H-55864

ACCOUNT NO. 01220

ANALYTICAL REPORT FORM

SAMPLE ID : MATRIX SPK
I-2R
DIGEST AS%
LAB ID 31202442
DATE RECEIVED: 12/02/93

PARAMETER	RESULTS	UNITS	DATE AND	ANALYST
Zinc	104	%	12/07/93	PRUTZMAN
Chromium G.F.	91	%	12/06/93	BAKER

FREE-COL LABORATORIES, INC.

P.O. BOX 557,COTTON ROAD
MEADVILLE, PENNSYLVANIA 16335
PHONE: (814) 724-6242
FAX: (814) 333-1466

5815 AIRPORT ROAD
ROANOKE, VIRGINIA 24012
PHONE: (703) 265-2544
FAX: (703) 362-1663

12/09/93

TO: HARRISON DIVISION GMC
ATTN: MS. CATHERINE VER
200 UPPER MOUNTAIN RD.
LOCKPORT NY 14094-1896

P.O. # H-55864

ACCOUNT NO. 01220

ANALYTICAL REPORT FORM

SAMPLE ID : MATRIX DUP
I-2R
DIGEST AS%
LAB ID 31202443
DATE RECEIVED: 12/02/93

PARAMETER	RESULTS	UNITS	DATE AND	ANALYST
Zinc	105	%	12/07/93	PRUTZMAN
Chromium G.F.	93	%	12/06/93	BAKER

This complete report is six pages.

Andrew K. Ecklund
ASST. LABORATORY DIRECTOR

pc: Steve Blair - GZA

ENVIRONMENTAL SAMPLE DESCRIPTION AND CHAIN OF CUSTODY RECORD

ATTACHMENT #2

E: 12/1/93 RESULTS REQUIRED BY: GZA

VERBAL RESULTS NEEDED? _____

LABORATORY: Free - Col

HARRISON DIVISION, GMC
200 UPPER MOUNTAIN ROAD
LOCKPORT, NEW YORK 14094
PHONE: ~~(716) 439~~ - (716)685-2300
CONTACT: Steve Blair (GZA)

E TYPE: (CIRCLE)
1) WASTEWATER 2) DRINKING WATER (3) MONITORING WELL 4) SOIL
5) SLUDGE 6) SOLID WASTE 7) OIL 8) INDUSTRIAL HYGIENE
9) OTHER _____

E DESCRIPTION: Road 7 - Quarterly Monitoring

AMPLE #	LOCATION	TIME	PARAMETERS	SAMPLE BOTTLE LOT # (OPTIONAL)
	I-1T	12^30	Chromium + Zinc	1
	I-1R	12^20		1
	I-2T	12^45		1
	I-2R	13^30		3 (vol for MS/MSD)
	I-5T	13.45		1
	I-5R	13.40		1
	I-6R	14^30		1

IMUM DETECTION LEVELS REQUIRED? _____

SSIBLE INTERFERENCES: _____

ASON FOR TEST (COMPARISON OF AREAS, BACKGROUND, ETC.) _____

Cooler Temp 3 °C

OTTLES RECEIVED BY: (DATE/TIME) [HRD PERSONNEL]	BOTTLES RELINQUISHED BY: (DATE/TIME) [HRD PERSONNEL]
OTTLES RELINQUISHED BY: (DATE/TIME) [HRD PERSONNEL]	BOTTLES RECEIVED BY: (DATE/TIME) [LAB PERSONNEL]
12/2/93 10^05	William F Slack 12-2-93 10^05
SAMPLE COLLECTED BY:	RECEIVED BY: [DATE, TIME, LAB SIGNATURE]
	Joni Kearns 12-2-93

ENVIRONMENTAL SAMPLE DESCRIPTION
AND
CHAIN OF CUSTODY RECORD

ATTACHMENT #2

E E: 12/1/93

RESULTS REQUIRED BY: 6ZA

VERBAL RESULTS NEEDED? _____

LABORATORY: Free - 61

HARRISON DIVISION, GMC
200 UPPER MOUNTAIN ROAD
LOCKPORT, NEW YORK 14094
PHONE: (716) ~~439~~ - 683 - 2300
CONTACT: Steve Blair (6ZA)

LE TYPE: (CIRCLE) 1) WASTEWATER 2) DRINKING WATER (3) MONITORING WELL 4) SOIL
5) SLUDGE 6) SOLID WASTE 7) OIL 8) INDUSTRIAL HYGIENE
9) OTHER _____

LE DESCRIPTION: Road 7 - Quaterly Monitoring

AMPLE #	LOCATION	TIME	PARAMETERS	SAMPLE BOTTLE LOT # (OPTIONAL)
	I-7T	1405	Chromium & Zinc	1
	I-7R	1400	Chromium & Zinc	1
	Trip Blank	—	Chromium & Zinc	1

NIMUM DETECTION LEVELS REQUIRED? _____

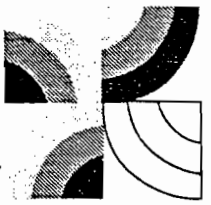
SSIBLE INTERFERENCES: _____

ASON FOR TEST (COMPARISON OF AREAS, BACKGROUND, ETC.) _____

Cooler Temp 3°C

TTLES RECEIVED BY: (DATE/TIME) [HRD PERSONNEL]	BOTTLES RELINQUISHED BY: (DATE/TIME) [HRD PERSONNEL]
TTLES RELINQUISHED BY: (DATE/TIME) [HRD PERSONNEL]	BOTTLES RECEIVED BY: (DATE/TIME) [LAB PERSONNEL]
Stephen Blair 12/2/93 10°5	Wm F Slats 12-2-93 10°5
SAMPLE COLLECTED BY: Stephen Blair	RECEIVED BY: [DATE, TIME, LAB SIGNATURE] John Kearns 12-2-93

FREE-COL LABORATORIES, INC.
P.O. Box 557, Cotton Road
Meadville, Pennsylvania 16335-0557
Phone. Area Code 814/724-6242
FAX. Area Code 814/333-1466



ENVIRONMENTAL
OCCUPATIONAL HEALTH
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SPECIALISTS

QUALITY CONTROL INFORMATION

Free-Col Laboratories analyzes control samples at specified frequencies during the analysis of samples submitted by clients in order to evaluate and document the precision and accuracy of the results which are reported. The attached quality control data records, prepared by the analytical staff at the time of analysis, show the results obtained for different types of control samples during the analysis of the batch of samples described as follows:

General Motors Sample Identification	Free-Col ID
I-1T 12/01/93	31202420
I-1R 12/01/93	31202421
I-2T 12/01/93	31202422
I-2R 12/01/93	31202423
I-5T 12/01/93	31202424
I-5R 12/01/93	31202425
I-6R 12/01/93	31202426
I-7T 12/01/93	31202427
I-7R 12/01/93	31202428
TRIP BLANK 11/30/93	31202429
I-1T 12/01/93 DIGESTION	31202430
I-1R 12/01/93 DIGESTION	31202431
I-2T 12/01/93 DIGESTION	31202432
I-2R 12/01/93 DIGESTION	31202433
I-5T 12/01/93 DIGESTION	31202434
I-5R 12/01/93 DIGESTION	31202435
I-6R 12/01/93 DIGESTION	31202436
I-7T 12/01/93 DIGESTION	31202437
I-7R 12/01/93 DIGESTION	31202438
TRIP BLANK 11/30/93	31202439

Form II

INITIAL AND CONTINUING CALIBRATION VERIFICATION

LAB NAME Free-Col Labs
SAMPLE BATCH: LAB ID 312-02-420\447

Units: mg/L

	Initial Calib.[1]			Continuing Calib.[2]					
Compound	True Value	Found	%R	True Value	Found	%R	Found	%R	Method[4]
Metals:									
Chromium	0.0300	0.0320	107	0.0300	0.0330	110	0.0330	110	F
Zinc	0.080	0.088	110	0.080	0.086	108			A
	0.800	0.794	99	0.800	0.795	99			A

[1]Initial Calibration Source Fisher Scientific

[2]Continuing Calibration Source Fisher Scientific

[4]Indicate Analytical Method Used: P - ICP; A - Flame AA; F - Furnace AA; CV-Cold Vapor

Form III

BLANKS

LAB NAME Free-Col Labs

SAMPLE BATCH: LAB ID 312-02-420\447

Units mg/L

Compound	Initial Calibration Blank Value	Continuing Calibration Blank Value
Chromium	0.0002	0.0006, 0.0005, 0.0004
Zinc	-0.001	0.000, -0.002, -0.001

Form V

SPIKE SAMPLE RECOVERY

LAB NAME Free-Col Labs

Free-Col Laboratories spikes each sample digested for metals run by graphite furnace AFTER the sample has been digested. If the recovery is not between 90-110%, the method of standard additions is performed in order to obtain the result (see Form VIII).

Lab ID	Percent Recovery	
	Chromium	Zinc
312-02-430	94	
312-02-431	95	
312-02-432	95	
312-02-433	97	
312-02-434	90	
312-02-435	102	
312-02-436	96	
312-02-437	98	
312-02-438	95	
312-02-439	96	

* Result obtained by method of standard addition.

Zinc analysis performed by AA.

FORM VI

DUPLICATES

LAB NAME Free-Col Labs
SAMPLE BATCH: LAB ID 312-02-420\447

Units: mg/L unless noted

Lab ID	Compound	AD/RPD[1] Control Limit	Sample(S)	Duplicate(D)	RPD[2]
309-02-431	Chromium	0.002/20.1	0.002	0.002	NA
309-02-442	Chromium	0.002/20.1	0.030	0.032	NA
309-02-436	Zinc	0.01/3.8	0.212	0.213	NA

[1] AD = Absolute Difference Control Limit which is established by plus or minus two times the detection limit. The RPD Control Limit is statistically established based on past data. Data must be acceptable according to one of the limits.

[2] RPD = [abs(S-D)/((S+D)/2)] x 100

NC = Non calculable RPD due to value(s) less than detection limit

NA = Not Applicable because acceptability is determined by meeting the AD limit (see footnote 1).

FORM VII

LABORATORY REFERENCE CONTROL SAMPLE

LAB NAME Free-Col Labs

SAMPLE BATCH: LAB ID 312-02-420\447

Units mg/L

Compound	True Value	Found	% Recovery
Chromium	0.0300	0.0320	107
Zinc	0.080	0.088	110
	0.800	0.794	99

Acceptance limits are 80% - 120% recovery.

FREE-COL LABORATORIES, INC.

P.O. BOX 557,COTTON ROAD
MEADVILLE, PENNSYLVANIA 16335
PHONE: (814) 724-6242
FAX: (814) 333-1466

5815 AIRPORT ROAD
ROANOKE, VIRGINIA 24012
PHONE: (703) 265-2544
FAX: (703) 362-1663

12/09/93

TO: FREE-COL LABORATORIES

P.O. BOX 557, COTTON RD.
MEADVILLE PA 16335-0557

P.O. #

ACCOUNT NO. 1

ANALYTICAL REPORT FORM

LAB ID	SAMPLE ID	PARAMETER	RESULT
31202444	BLANK	ACID DIGESTION PREP	COMPLETE
31202445	PRC%	ACID DIGESTION PREP	COMPLETE

DATE AND ANALYST
12/03/93 MAIN

FREE-COL LABORATORIES, INC.

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5815 AIRPORT ROAD
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PHONE: (703) 265-2544
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12/09/93

TO: FREE-COL LABORATORIES

P.O. BOX 557, COTTON RD.
MEADVILLE PA 16335-0557

P.O. #

ACCOUNT NO. 1

ANALYTICAL REPORT FORM

SAMPLE ID : BLANK
DIGESTION

LAB ID 31202446
DATE RECEIVED: 12/02/93

PARAMETER	RESULTS	UNITS	DATE AND ANALYST
Zinc	0.009	MG/L	12/07/93 PRUTZMAN
Chromium G.F.	<0.001	MG/L	12/06/93 BAKER

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5815 AIRPORT ROAD
ROANOKE, VIRGINIA 24012
PHONE: (703) 265-2544
FAX: (703) 362-1663

12/09/93

TO: FREE-COL LABORATORIES

P.O. BOX 557, COTTON RD.
MEADVILLE PA 16335-0557

P.O. #

ACCOUNT NO. 1

ANALYTICAL REPORT FORM

SAMPLE ID : PRC%
DIGESTION

LAB ID 31202447
DATE RECEIVED: 12/02/93

PARAMETER	RESULTS	UNITS	DATE AND	ANALYST
Zinc	106	%	12/07/93	PRUTZMAN
Chromium G.F.	109	%	12/06/93	BAKER

QUALITY CONTROL DATA I

AMETER: Zinc ANALYST: Vladymyr DATE: 12-7-93

ERENCE CONTROL UNITS: mg/L

rget	Acceptance Limits						
2.08	0.063	to	0.095	0.088,	0.086,	———,	———
0.8	0.716	to	0.874	0.794,	0.795,	———,	———
———	———	to	———	———,	———,	———,	———

EPARATION REFERENCE CONTROL Units: mg/L

arget	Acceotance Limits			Assayed Value:		
0.505	———	to	———	Date Prepped:	12/3,	12/6, ———

EPEAT CONTROL AD = Absolute Difference RPD = Relative Percent Difference
nits: mg/L Acceptable AD: 0.01 Acceptable RPD: 3.8 %

ample I.D.	Sample Result	Repeat Result	AD	RPD
312-02-054	0.489	0.485	0.004	— %
312-02-436	0.212	0.213	0.001	— %
312-03-053	0.029	0.027	0.002	— %
———	———	———	———	——— %
———	———	———	———	——— %
———	———	———	———	——— %

SPIKE CONTROL Units: mg/L
Acceptable Limits for Percent Recovery: 76 % to 120 %

Sample ID	Spike Added (+0.500)	Spike Result	Sample Result	% Recovery
312-02-230	0.512	0.538	0.038	104 %
312-06-050	0.512	0.637	0.153	94 %
———	———	———	———	——— %
———	———	———	———	——— %

BLANK Units: mg/L Lab Blank <0.005 <0.00

Result: −0.001, 0.050, −0.002, −0.001 Date Prepped 12/3 12/

DETECTION LIMIT Units: mg/L

Limit Value: 0.005 Assayed Value: 0.005, ———, ———

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LIMITS IN EFFECT AS OF MAY 17, 1993

QUALITY CONTROL DATA I

PARAMETER: Chromium - GF ANALYST: Baker DATE: 12-6-93

REFERENCE CONTROL UNITS: ug/L

Target	Acceptance Limits					
30	27	to 35	32	33	33	
		to				
		to				

PREPARATION REFERENCE CONTROL Units:

Target	Acceptance Limits	Assayed Value:		
30	to	Date Prepped: 312-03-PRC		

REPEAT CONTROL AD = Absolute Difference RPD = Relative Percent Difference
Units: mg/L Acceptable AD: 0.002 Acceptable RPD: 20.1 %

Sample I.D.	Sample Result	Repeat Result	AD	RPD
312-02-430	0.002	0.002	0.000	— %
312-02-441	0.030	0.032	0.002	— %
311-30-109	0.021	0.020	0.001	— %
				%
				%
				%

SPIKE CONTROL Units:
Acceptable Limits for Percent Recovery: 90 % to 110 %

Sample ID	Spike Added	Spike Result	Sample Result	% Recovery
	SpKs on Attached sheet			%
				%
				%
				%

BLANK Units: mg/L Lab Blank 0.0002

Result: 0.0005, 0.0006, 0.0005, 0.0004 Date Prepped 312-03-A

DETECTION LIMIT Units: mg/L

Limit Value: 0.001 Assayed Value: 0.0012, ,

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QUALITY CONTROL DATA

PARAMETER: CrGF ANALYST: Baker DATE: 12-6-93

SPIKE CONTROL UNITS: mg/L

Acceptable Limits for Percent Recovery; 90 % to 110 %

Sample I.D.	Spike Added	Spiked Result	Sample Result	% Recovery
312-02-430	0.0263	0.0262	0.0016	94
431		0.0263	0.0012	95
432		0.0270	0.0021	95
433		0.0278	0.0023	97
434		0.0384	0.0147	90
435		0.0278	0.0009	102
436		0.0301	0.0049	96
437		0.0270	0.0012	98
438		0.0262	0.0013	95
439		0.0260	0.0008	96
446		0.0264	0.0006	98

Free-Col Laboratories, Inc.
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