LUST FORM

(3136)

INCIDENT INFORMATION

LUST Incident Nbr: _____ LUST Log Nbr: _____ UST Facility ID: 3124

Date Received: 4/13/89 Received By: 26-89-064 Emergency Resp Taken: Y (N)

Tank Location: Name: James River - Flexible Pkg Div (coated Products)

Street: 3400 N. Marine Dr.

City: Portland Zip: 97217

County: Mult Phone: _____

All tanks removed at this site - except Diesel tanks - replaced above ground

Incident Comments: _____

CONTACT & MAIL TYPES

Russ Hamblin - BTC 244-7005

Reported By:	LUST Contact:	Responsible Party:
Name: James River Jeff Mason	Name:	Name: David Ernst James River
Street:	Street:	Street:
City: Zip:	City: Zip:	City: Zip:
County: Phone: 286-1621	County: Phone:	County: Phone: 286-1621 x690

SITE ASSESSMENT

LUST Incident Nbr: (XXXXXXXXXXXX)

Date Investigated: 4/13/89 Investigated By: L&Garner

Release Exists: (Y) N (Circle)

Confirmation Method: A)Staff B)Lab:DEQ (C)Lab:RP D)Lab:Other E)RP F)Other (Circle)

Cleanup Necessary: (Y) N (Circle)

Regulated Tank: (Y) N (Circle)

Exposure Assessment: Y N (Circle)

Off-Site Migration: Y (N) ? (Circle)

Estimated Gallons Released: _____

Priority: _____

Discovery Date: 4/13/89

How Discovered: (Circle)
A)Routine Monitoring B)Inventory Control (C)Decommissioning D)Site Assessment
E)Complaint F)Tank Test G)Other

Material Released: (Circle)
A)Unleaded Gasoline B)Leaded Gasoline (C)Misc. Gasoline
D)Diesel E)Fuel Oil F)Waste Oil
G)Lubricant (H)Solvent I)Bunker Fuel
J)Other Pet. Dist. K)Chemical L)Unknown

Alcohol
Maybe Metals

Source of Release: (Circle)
A)Tank Leak B)Pipe Leak (C)Overfill D)Surface Spill
E)Pump/Valve Leak F)Other G)Unknown

Impacts: (Circle)				
Soil	(Y)	N	%	?
Groundwater	(Y)	(N)	%	(?)
Surface Water	Y	(N)	%	?
Drinking Water	Y	(N)	%	?
Facility (Vapor)	Y	(N)	%	?
Facility (Free Product)	Y	(N)	%	?

Site Assessment Comments: 11/14/89 - Monitoring - review report.

SITE MANAGEMENT

LUST Incident Nbr: (XXXXXXXXXXXX)

F.I. 5-6-96
NFA 9-3-96

Date Released Stopped: _____

Cleanup Activity: Start Date: _____ Under Control Date: _____

End Date: _____ Contractor Name: _____

Cleanup Guideline: Matrix (C.A.P.) (Circle) Cleanup Lead: RP SLw/TF SLw/oTF (Circle)

Free Product Disposal:		Soil Disposal:	
Est. Gallons:	_____	Est. Cu/Yds:	~~70~~ yd
Resp. Party:	_____	Resp. Party:	_____
Disposal Location:	_____	Disposal Location:	onsite Aeration
Removal Date:	_____	Removal Date:	N/A.

Enforcement Action: Y N (Circle) (used As shallow fill onsite)

Cost Recovery Initiated: Y N (Circle)

Source of Cost Recovery:

Pct. R.P.: _____
Pct. SLw/TF: _____
Pct. SLw/oTF: _____

Estimations: Cost of Cleanup: _____ Staff Time On Project: _____

Site Management Comments: _____

~~Referred to ECD~~ 4/26/89

x 9-3-96 x

< MORE ON BACK >

UPDATES: 9-4-96

PETROLEUM RELEASE FORM

Please Check All That Apply

INCIDENT INFORMATION

LOG NBR: 26-89-0064 RECEIVED BY: _____

UST FAC NBR: 3124 DATE REPORTED: 4 / 13 / 89

- [x] REGULATED UST
- [ ] NON-REGULATED UST
- [ ] HEATING OIL TANK

SITE NAME: JAMES RIVER - FLEXIBLE PKG. DIV.

SITE ADDRESS: 3400 N. MARINE DR.

SITE CITY: PDX ZIP: 97217

SITE COUNTY: MULT. PHONE: _____

FUNDING

- [x] LUST
- [ ] OHC
- [ ] HSRAF
- [ ] FINANCIAL ASST

- [ ] INVOICE START
- [ ] INVOICE STOP
- [ ] NFA SENT

PROJECT MANAGER: _____

MAIL CONTACTS

REPORTED BY

NAME: JEFF MASON

COMPANY: JAMES RIVER

ADDRESS: _____

CITY: _____ ZIP: _____

STATE: _____ PHONE: _____

RESPONSIBLE PARTY

NAME: DAVID ~~ERNST~~ ERNST

COMPANY: JAMES RIVER

ADDRESS: _____

CITY: _____ ZIP: _____

STATE: _____ PHONE: 286-1621 X690

INVOICE CONTACT

NAME: _____

COMPANY: _____

ADDRESS: _____

CITY: _____ ZIP: _____

STATE: _____ PHONE: _____

OTHER CONTACT(S)

NAME: RUSS HAMBLIN - B+E

COMPANY: _____

ADDRESS: _____

CITY: _____ ZIP: _____

STATE: _____ PHONE: _____

SITE ASSESSMENT

DATE DISCOVERED: 4 / 13 / 89

- [ ] EMERGENCY RESP.
- [ ] ENFORCEMENT
- [ ] FUTHER CLEANUP REQ.
- [ ] NO FURTHER CLEANUP REQ.
- [ ] OFFSITE MIGRATION

_____ L.I.P.S. SCORE (Region)

CONFIRMATION:

- [ ] SI) STAFF
- [ ] LD) LAB: DEQ
- [ ] LR) LAB: RP
- [ ] LO) LAB: OTHER
- [x] RR) RP REPORT
- [ ] CN) CONTRACTOR
- [ ] OT) OTHER

DISCOVERY:

- [ ] RM) ROUTINE MONITORING
- [x] DC) DECOMMISSIONING
- [ ] CP) COMPLAINT
- [ ] IC) INVENTORY CONTROL
- [ ] SA) SITE ASSESSMENT
- [ ] TT) TANK TEST
- [ ] OT) OTHER

CAUSE:

- [ ] TL) TANK LEAK
- [ ] PL) PIPE LEAK
- [x] OF) OVERFILL
- [ ] SS) SURFACE SPILL
- [ ] PV) PUMP/VALVE LEAK
- [ ] OT) OTHER _____
- [ ] UN) UNKNOWN

9-3-96 *

CONTAMINANTS - IMPACTS

CONTAMINANTS:

- ☐ UG) UNLEADED GASOLINE
- ☐ LG) LEADED GASOLINE
- ☒ MG) MISC. GASOLINE
- ☐ DS) DIESEL
- ☐ FO) FUEL OIL
- ☐ WO) WASTE OIL
- ☐ LB) LUBRICANT
- ☒ SV) SOLVENT
- ☐ BF) BUNKER FUEL
- ☐ OP) OTHER PET. DIST.
- ☐ CH) CHEMICAL
- ☐ HO) HEATING OIL
- ☐ UN) UNKNOWN
- ☐ OT) OTHER _____

MEDIA/IMPACT:

- ☒ SL) SOIL
- ☒ GW) GROUNDWATER
- ☐ SW) SURFACE WATER
- ☐ DW) DRINKING WATER
- ☐ FV) FACILITY (VAPOR)
- ☐ FP) FACILITY (FREE PROD.)

SITE - SOIL MANAGEMENT

RELEASE STOPPED: _____/_____/_____

CLEANUP STARTED: _____/_____/_____

REMEDIATION COMPLETED: _____/_____/_____

NO FURTHER ACTION: _____/_____/_____

SWLA PERMIT NUMBER: _____

DATE ISSUED: _____/_____/_____

AMOUNT OF SOIL (yds 3) TREATED ON SITE: _____

AMOUNT OF SOIL (yds 3) TREATED OFF SITE: _____

TREATMENT METHOD:

- ☐ AREATION
- ☐ THERMAL
- ☐ BIOLOGICAL
- ☐ OTHER _____

AMOUNT OF SOIL (yds 3) DISPOSED OF: _____ ☐ TREATED ☐ UNTREATED

FINAL DISPOSITION OF SOIL:

- ☐ ONSITE
- ☐ LANDFILL
- ☐ ROAD BASE
- ☐ OTHER _____

NOTES/COMMENTS: _____

This Space Provided For Regional Use

STATE OF OREGON

DEPARTMENT OF ENVIRONMENTAL QUALITY **INTEROFFICE MEMORANDUM**

TO: Darby Bacon, UST Cleanup Section, ECD
Jeanie Sedgely, OD

FROM: Sheila Monroe, Northwest Region

SUBJECT: James River - Flexible Package Division
26-89-064

DATE: April 3, 1992

Cost Recovery is being initiated by the Northwest Region for:
James River - Flexible Package Division
3400 N Marina Drive
Portland, Oregon

This is a LUST Trust Fund eligible site.

Gasoline contamination was reported to the Department on April 13, 1989. The contamination was discovered during decommissioning by removal of USTs. Petroleum contamination has impacted both soils and groundwater. The extent of contamination is unknown.

Cost recovery information and billings should be sent to:
Mr. William Montero
Plant Maintenance Manger
James River Corporation
3400 North Marina Drive
Portland, Oregon 97217

Oregon

DEPARTMENT OF
ENVIRONMENTAL
QUALITY

May 01, 1992

William E. Montero
James River II, Inc., Flexible Packaging
PO Box 17128
Portland , OR 97217

Re: Recovery of DEQ Oversight Costs
JAMES RIVER FLEXIBLE PACKAGE DIVISION
3400 N. MARINE DRIVE (P.O. BOX 17128)
PORTLAND , OR 97217
LUST ID Number: 26 89 0064

The purpose of this letter is to provide notification that you will be receiving an invoice from the Department of Environmental Quality (DEQ) for costs of DEQ oversight activities at this facility.

Oregon law (ORS 465.330) requires the DEQ to recover all reasonable costs associated with the investigation and cleanup of contaminated sites.

After the initial invoice, you will receive a monthly invoice for Department oversight activities, unless the total oversight costs are below $100. For accounts less than $100, the Department will invoice quarterly.

Enclosed is the fact sheet on cost recovery, which briefly describes the program used by the Underground Storage Tank Cleanup Program.

Should you have any questions about DEQ's cost recovery program or your invoice, please contact Darby Bacon at (503) 229-6635, or toll free at 1-800-452-4011. Other questions regarding the cleanup status of the site should be directed to the DEQ regional office handling oversight of the cleanup.

Sincerely,

Lon Revall
Manager - UST Cleanup Program
Department of Environmental Quality

Enclosure
LJR:djb
cc: Regional office
Business Office

811 SW Sixth Avenue
Portland, OR 97204-1390
(503) 229-5696
TDD (503) 229-6993
DEQ-1

BUILDING IDENTIFICATION

NORTH PORTLAND HARBOR

JAMES RIVER CORP.
3400 N. MARINE DR
PORTLAND, OR

3400 N. MARINE DR.

No. 19
UST 31,32 29,30
UST 33
No. 7
No. 6
No. 8
No. 5
No. 2
No. 1
No. 3
No. 4
No. 21
Sewer Tank
No. 10
W-1
W-2
W-3
W-4
W-5
W-6
W-7
OUT GATE 2
GATE 1
No. 17
No. 15
UST 1 thru 7
? capped
Gasoline UST 11
10 & 11
No. 11
No. 12
UST 8,9
UST 19 thru 26
UST 27,28
No. 14
LAB
No. 9
No. 20
No. 16
UST 34,35
CZ PROPERTY LINE
200' TO PROPERTY LINE
No. 18
No. 13
60
80 x 80
116
44
(CZ Ink Div.)
UST 12-18
"Aeration Field"
270
79
247
63
150 yds³ Press Area Soils
270 yds³ Ink Div. Soils
BF 1
BF 2
Composite
70 yds³ gasoline UST soils
130'
600
400
1121' CURVE
N

UST: UNDERGROUND STORAGE TANK

PACIFIC ANALYTICAL LABORATORY inc
9405 S.W. Nimbus Ave. Beaverton, OR 97005 (503) 644-0860

April 25, 1989

Brown & Caldwell
9620 SW Barbur Blvd., Suite 200
Portland, OR 97219

Attn: Russ Hamblin

PAL REPORT NUMBER: 89-0309
P.O./JOB NUMBER: 4488
DATE SUBMITTED: 4/18/89
ITEMS: One Water Sample - GW1
Two Soil Samples - BF1, BF2

ANALYSIS

METHODS: Total Metals per EPA 3050, 7000 series
Volatiles per EPA 602

Total Metals - mg/kg

	Ink-stained Soil BF1	Background composite BF2
Cadmium	0.5	0.8
Chromium	590	440
Copper	100	85
Lead	2900	1800
Nickel	14	13
Zinc	90	85

Aeration Field

Groundwater under 1,000 gallon-gasoline UST

Volatiles - mg/L

	GW1	Lab Blank
Benzene	0.4 = 400ppb	ND
Toluene	20 = 20,000 ppb	ND
Ethyl Benzene	8 = 8,000 ppb	ND
Xylene	38 = 38,000ppb	ND

ND = Not Detected

Respectfully,

Philip Nerenberg
Philip Nerenberg
Chemist

Linnet O'Hanlon
Linnet O'Hanlon
Chemist

PACIFIC ANALYTICAL LABORATORY inc.
9405 S.W. Nimbus Ave. Beaverton, OR 97005 (503) 644-0660

April 25, 1989

PEMCO
P.O. Box 11568
Portland, OR 97211

Ink Division

Attn: Tim Veley

PAL REPORT NUMBER: 89-0292
P.O./JOB NUMBER: 2032
DATE SUBMITTED: 4/13/89
ITEMS: Seven Soil Samples

ANALYSIS

METHOD: Modified EPA 3810 (GC/MS)
Results in mg/kg (ppm)

	1	2	3	4	5	6	7
Methanol	85	--	--	--	--	--	8
Ethanol	150	--	--	--	7	--	85
Acetone	370	--	14	450	7	4	--
2-Propanol	3500	--	40	1600	4	9	--
1-Propanol	500	--	--	--	--	14	--
Methyl Ethyl Ketone	--	--	--	4	--	--	--
Toluene	2	--	--	--	--	--	--

2-Propanol = Isopropyl Alcohol
1-Propanol = Normal Propyl Alcohol

Respectfully,

Philip Nerenberg
Philip Nerenberg
Chemist

Reviewed by:

PACIFIC ANALYTICAL LABORATORY inc.
9405 S.W. Nimbus Ave. Beaverton, OR 97005 (503) 644-0660

April 25, 1989

PEMCO
P.O. Box 11569
Portland, OR 97211

Press Area & Gasoline tank

Attn: Tim Veley

PAL REPORT NUMBER: 89-0301
P.O./JOB NUMBER: 2032 (James River)
DATE SUBMITTED: 4/17/89
ITEMS: Eleven Soil Samples

METHOD: Modified EPA 3810 (GC/MS)
Results in mg/kg (ppm)

	1	2	3	4	5	6
Methanol	--	--	--	--	340	1200
Ethanol	--	--	2	--	2600	4200
Acetone	--	--	--	--	21	33
2-Propanol	--	--	--	--	980	2000
Methyl Isobutyl Ketone	--	--	--	--	180	770
1-Hexanol	--	--	--	--	200	110
2-Hexanol	--	--	--	--	300	160
Ethyl Acetate	--	--	--	--	85	28
1-Butanol	--	--	--	--	240	370
1-Propanol	--	--	--	--	60	120
Toluene	--	--	--	--	--	--

	7	8	9	10	11
Methanol	2	90	--	--	--
Ethanol	13	1500	--	--	--
Acetone	1	--	--	--	--
2-Propanol	2	440	--	--	--
Methyl Isobutyl Ketone	--	5	--	--	--
1-Hexanol	--	--	--	--	--
2-Hexanol	--	--	--	--	--
Ethyl Acetate	--	18	--	--	--
1-Butanol	--	--	--	--	--
1-Propanol	--	790	--	--	--
Toluene	--	1	--	--	--
				270	160

under gasoline tank
BTEX & gasoline to be reported late

ppm Vol Hydrocarbons

2-Propanol = Isopropyl Alcohol
1-Propanol = Normal Propyl Alcohol

Respectfully,

Philip Nerenberg
Philip Nerenberg
Chemist

Reviewed by: SMO

PACIFIC ANALYTICAL LABORATORY inc.
9405 S.W. Nimbus Ave. Beaverton, OR 97005 (503) 644-0660

Ink Division

April 25, 1989

PEMCO
P.O. Box 11589
Portland, OR 97211

Attn: Tim Veley

PAL REPORT NUMBER: 89-0301a
P.O./JOB NUMBER: 2016 (James River)
DATE SUBMITTED: 4/18/89
ITEMS: Three Soil Samples

ANALYSIS

METHOD: Modified EPA 3810 (GC/MS)

Results in mg/kg (ppm)

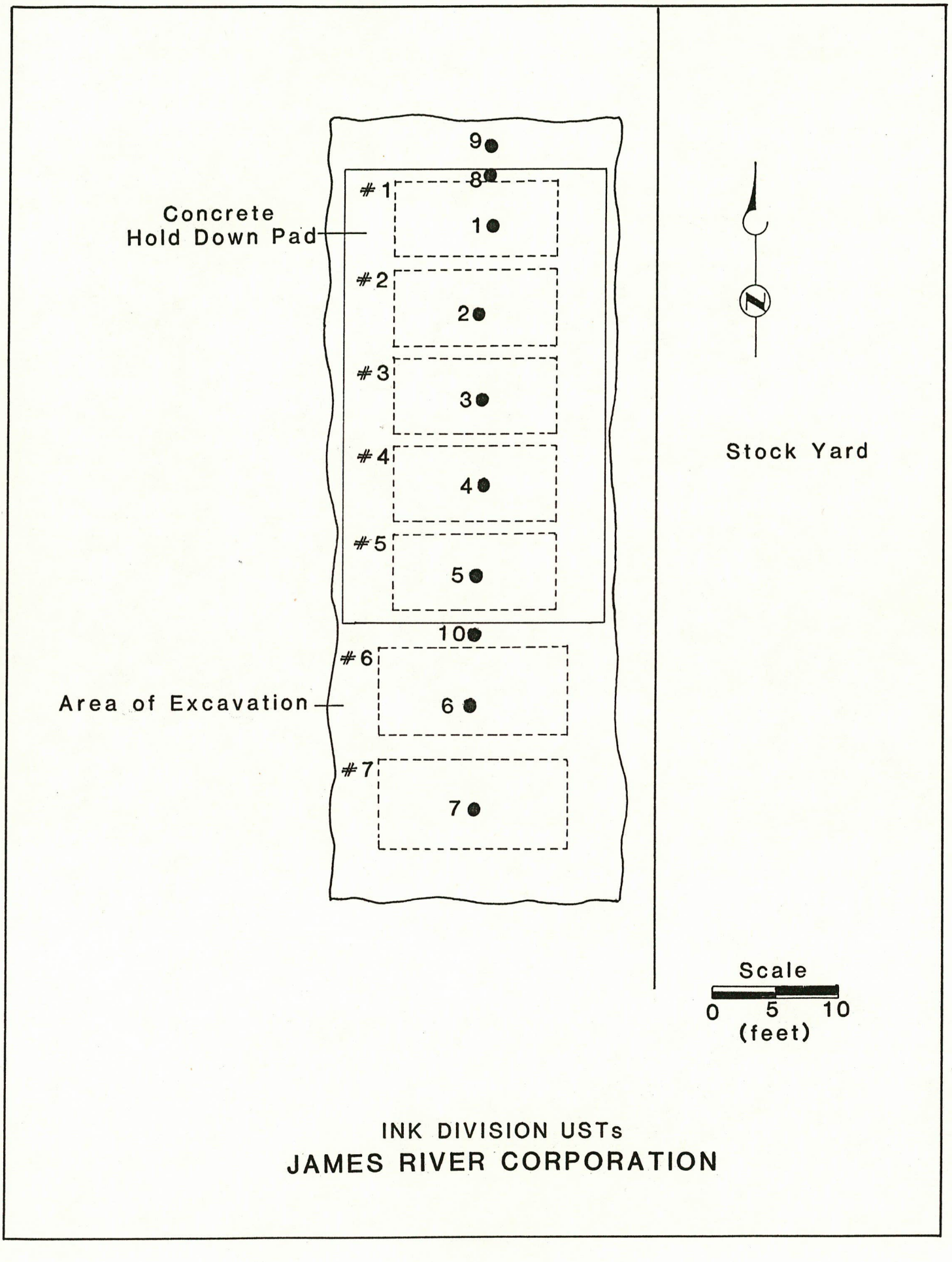
	~~1~~ 8	~~2~~ 9	~~3~~ 10
Methanol	--	--	23
Ethanol	3	5	270
Acetone	310	280	31
2-Propanol	1700	870	100
Methyl Ethyl Ketone	2	2	--
1-Propanol	--	--	2500

2-Propanol = Isopropyl Alcohol
1-Propanol = Normal Propyl Alcohol

Respectfully,

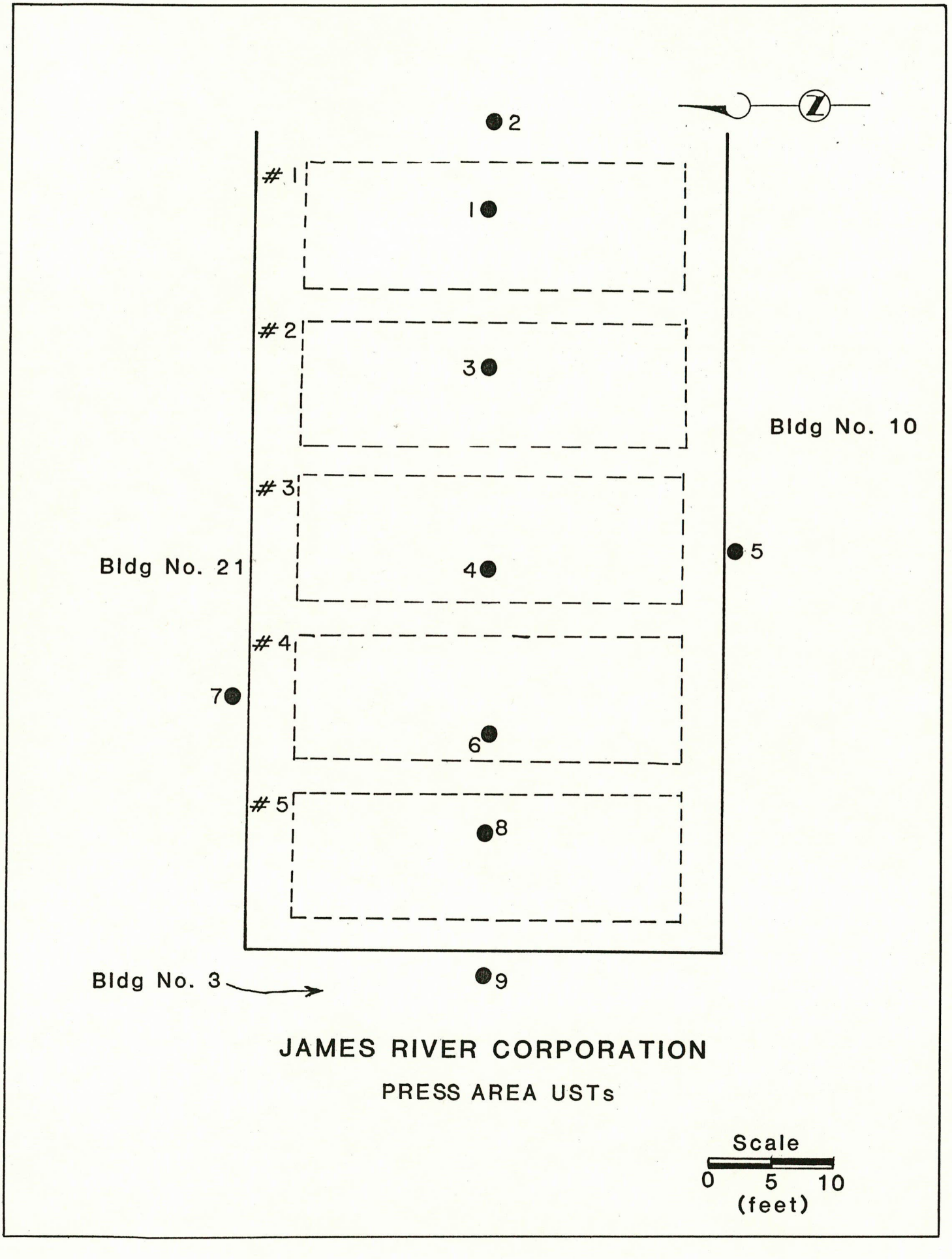
Philip Nerenberg
Philip Nerenberg
Chemist

Reviewed by:



INK DIVISION USTs

JAMES RIVER CORPORATION



JAMES RIVER CORPORATION

PRESS AREA USTs

Scale

0 5 10

(feet)

JAMES RIVER CORPORATION

SOIL AND GROUNDWATER INVESTIGATIONS

MAY 9, 1989

INK DIVISION USTS

Work to date:

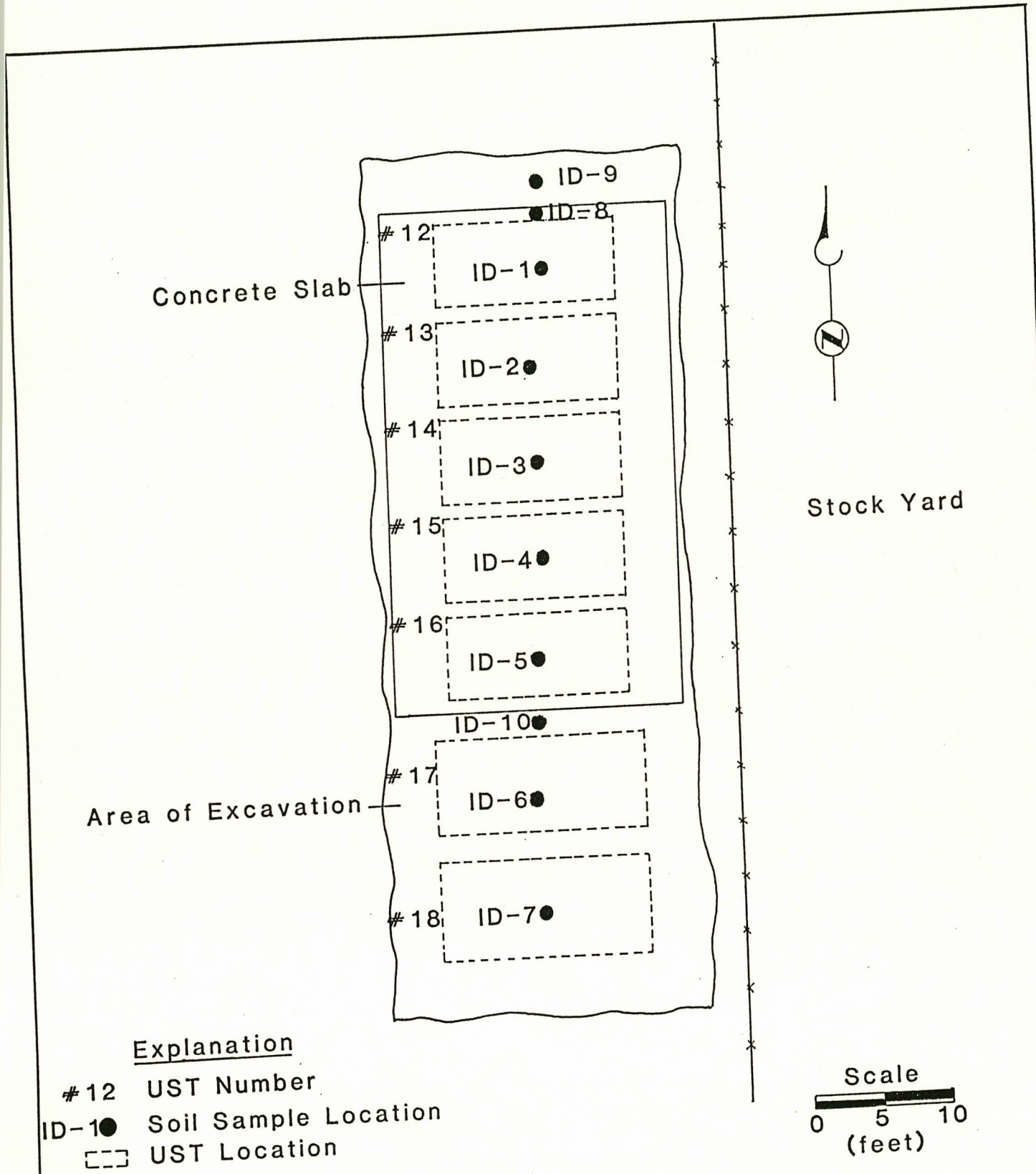
- 7 USTs were removed.
- 10 soil samples were collected and analyzed for volatile organic compounds (VOCs).
- Analyses detected several VOCs including:

  Methanol (0 to 65 ppm)
  Ethanol (0 to 270 ppm)
  Acetone (0 to 450 ppm)
  Isopropyl alcohol (0 to 3,500)
  Normal propyl alcohol (0 to 2,500 ppm)
  Methyl ethyl ketone (0 to 4 ppm)
  Toluene (0 to 2 ppm)

- 1 groundwater sample, collected from the bottom of the excavation was analyzed for VOCs.
- Detected in the groundwater sample were:

  Isopropyl alcohol (12,000 ppm)
  Acetone (3,700 ppm)

- Approximately 270 cubic yards of contaminated soil were removed from the excavation.
- The contaminated soils are being aerated.



INK DIVISION USTs

Table 3-3. Soil Sample Analytical Results Summary
Ink Division USTs

	Sample Number	ID-1	ID-3	ID-4	ID-5	ID-6	ID-7	ID-8	ID-9	ID-10
	Sample Location	Tank #12[a]	Tank #14[a]	Tank #15[a]	Tank #16[a]	Tank #17[a]	Tank #18[a]	Beneath Concrete Pad	North Excav Floor	South Excav Floor
	Sample Depth (feet)	5	5	5	5	6	6	7.5	8	9
EPA Method #	Constituents[b]									
3810 modified GC/MS	Methanol	65	c	c	c	c	8	c	c	23
	Ethanol	150	c	c	7	c	85	3	5	270
	Acetone	370	14	450	7	4	c	310	280	31
	Isopropyl Alcohol	3,500	40	1,600	4	9	c	1,700	870	100
	Normal Propyl Alcohol	500	c	c	c	14	c	c	c	2,500
	Methyl Ethyl Ketone	c	c	4	c	c	c	2	2	c
	Toluene	2	c	c	c	c	c	c	c	c

[a]Sample collected from beneath the tank number given.
[b]Constituent results in mg/kg (ppm).
[c]Not detected above laboratory detection limits of 1 mg/kg (ppm).

NOTE: Sample #ID-2 - all constituents not detected.

SOIL AERATION FIELD
METALS INVESTIGATION

Work to date:

- 2 soil samples were collected and analyzed for total metals.

- Analysis detected several metals (total metals) including:

  Cadmium (0.5 and 0.8 ppm)
  Chromium (590 and 440 ppm)
  Copper (100 and 85 ppm)
  Lead (2,900 and 1,800 ppm)
  Nickel (14 and 13 ppm)
  Zinc (90 and 85 ppm)

May 8, 1989

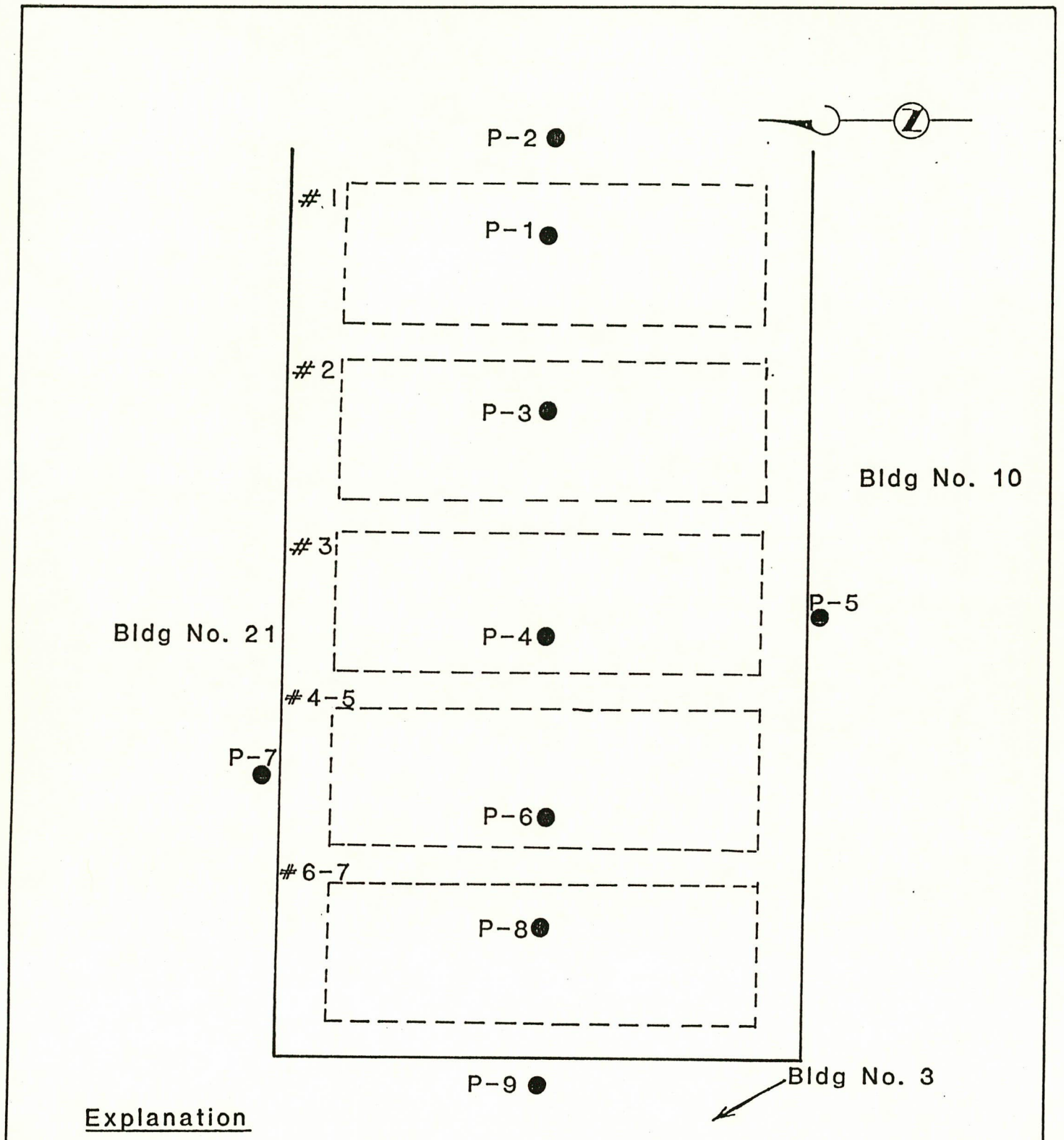
PRESS ROOM AREA USTS

Work to date:

- 5 USTs were removed.
- 9 soil samples were collected and analyzed for volatile organic compounds (VOCs)
- Analyses detected several alcohols including:

  methanol (0 to 1,200 ppm)
  ethanol (0 to 4,200 ppm)
  acetone (0 to 33 ppm)
  isopropyl alcohol (0 to 2,000)
  normal propyl alcohol (0 to 790 ppm)
  methyl isobutyl ketone (0 to 770 ppm)
  1-hexanol (0 to 200 ppm)
  2-hexanol (0 to 300 ppm)
  ethyl acetate (0 to 85 ppm)
  1-butanol (0 to 370 ppm)
  toluene (0 to 1 ppm)

- Approximately 150 cubic yards of contaminated soil was removed from the excavation.
- The contaminated soils are being aerated.



PRESS ROOM AREA USTs

Table 3-1. Soil Sample Analytical Results Summary
Press Room Area USTs

	Sample Number	P-1	P-2	P-3	P-4	P-5	P-6	P-7	P-8	P-9
	Sample Location	Tank #1[a]	East Sidewall	Tank #2[a]	Tank #3[a]	South Sidewall	Tank #4-5[a]	North Sidewall	Tank #6-7[a]	West Side Wall
	Sample Depth (feet)	11	10	11	11	8	11	8	11	10
EPA Method #	Constituents[b]									
3510 modified GC/MS	Methanol	c	c	c	c	340	1,200	2	90	c
	Ethanol	c	c	2	c	2,600	4,200	13	1,500	c
	Acetone	c	c	c	c	21	33	1	c	c
	Isopropyl Alcohol	c	c	c	c	980	2,000	2	440	c
	Methyl Isobutyl Ketone	c	c	c	c	180	770	c	5	c
	1-Hexanol	c	c	c	c	200	110	c	c	c
	2-Hexanol	c	c	c	c	300	160	c	c	c
	Ethyl Acetate	c	c	c	c	85	28	c	18	c
	1-Butanol	c	c	c	c	240	370	c	c	c
	Normal Propyl Alcohol	c	c	c	c	60	120	c	790	c
	Toluene	c	c	c	c	c	c	c	1	c

[a]Sample collected from beneath the tank number given.
[b]Constituent results in mg/kg (ppm).
[c]Not detected above laboratory detection limits of 1 mg/kg (ppm).

ESS ROOM AREA GASOLINE TA K

Work to date:

- Underground gasoline storage tank was removed.
- 2 soil samples were collected from beneath the tank and analyzed for fuel hydrocarbons.
- Analysis of the soil samples detected hydrocarbon constituents including:

  Volatile petroleum hydrocarbons (160 and 270 ppm) Xylene (0.3 and 0.6 ppm)

- 1 groundwater sample was collected from the excavation and analyzed for hydrocarbons.
- Analysis of the groundwater sample also detected hydrocarbon constituents including:

  Benzene (400 ppb)
  Toluene (20,000 ppb)
  Ethylbenzene (8,000 ppb)
  Xylene (38,000 ppb)

- Approximately 70 cubic yards of contaminated soil was removed from the excavation.
- The contaminated soils are being aerated.

Table 3-2. Soil and Groundwater Sample Analytical Results Summary
Underground Gasoline Storage Tank

Sample Number	Sample Depth (feet)	Volatile Petroleum Hydrocarbons[a]	Benzene	Toluene	Ethyl Benzene	Xylene
P-10[b]	10	270	d	d	d	0.6
P-11[b]	12	160	d	d	d	0.3
GW-1[c]	10-12	e	400	20,000	8,000	38,000

[a]Similar to extremely weathered gasoline.

[b]Soil sample analyzed by hydrocarbons by EPA Method 3810 modified GC/MS, concentrations in mg/kg (ppm).

[c]Groundwater sample analyzed for aromatic volatile hydrocarbons by EPA Method 602.

[d]Not detected above laboratory detection limits of 0.1 mg/kg (ppm).

[e]Not analyzed.

PACIFIC ANALYTICAL LABORATORY inc.

9405 S.W. Nimbus Ave. Beaverton, OR 97005 (503) 644-0660

April 25, 1989

PEMCO
P.O. Box 11569
Portland, OR 97211

Attn: Tim Veley

PAL REPORT NUMBER: 89-0292
P.O./JOB NUMBER: 2032
DATE SUBMITTED: 4/13/89
ITEMS: Seven Soil Samples

ANALYSIS

METHOD: Modified EPA 3810 (GC/MS)
Results in mg/kg (ppm)

	ID-1	ID-2	ID-3	ID-4	ID-5	ID-6	ID-7
Methanol	65	--	--	--	--	--	8
Ethanol	150	--	--	--	7	--	85
Acetone	370	--	14	450	7	4	--
2-Propanol	3500	--	40	1600	4	9	--
1-Propanol	500	--	--	--	--	14	--
Methyl Ethyl Ketone	--	--	--	4	--	--	--
Toluene	2	--	--	--	--	--	--

2-Propanol = Isopropyl Alcohol
1-Propanol = Normal Propyl Alcohol

Respectfully,

Philip Nerenberg

Philip Nerenberg
Chemist

Reviewed by:

cc: Brown and Caldwell

PACIFIC ANALYTICAL LABORATORY inc.

9405 S.W. Nimbus Ave. Beaverton, OR 97005 (503) 644-0660

April 25, 1989

PEMCO
P.O. Box 11569
Portland, OR 97211

Attn: Tim Veley

PAL REPORT NUMBER: 89-0306 Revision
P.O./JOB NUMBER: 2016 (James River)
DATE SUBMITTED: 4/18/89
ITEMS: Three Soil Samples

ANALYSIS

METHOD: Modified EPA 3810 (GC/MS)

Results in mg/kg (ppm)

	ID-8	ID-9	ID-10
Methanol	--	--	23
Ethanol	3	5	270
Acetone	310	280	31
2-Propanol	1700	870	100
Methyl Ethyl Ketone	2	2	--
1-Propanol	--	--	2500

2-Propanol = Isopropyl Alcohol
1-Propanol = Normal Propyl Alcohol

Respectfully,

Philip Nerenberg
Chemist

Reviewed by:

cc: Brown & Caldwell

PACIFIC ANALYTICAL LABORATORY inc.

9405 S.W. Nimbus Ave. Beaverton, OR 97005 (503) 644-0660

May 3, 1989

Brown & Caldwell
9620 SW Barbur Blvd., Suite 200
Portland, OR 97219

Attn: Russ Hamblin

PAL REPORT NUMBER: 89-0359
P.O./JOB NUMBER: 4488 James River
DATE REQUESTED: 4/27/89

PAL REFERENCE NUMBERS: 89-0292
89-0301
89-0306
89-0309

ANALYSIS

METHODS: EPA 1310, 7000 series
E.P. Toxicity - Metals (mg/L)

	Cadmium	Chromium	Copper	Lead	Nickel	Zinc
AF-1	<0.02	<0.1	<0.02	<0.1	<0.1	1.14
AF-2	<0.02	0.2	0.02	0.1	<0.1	0.36
P-1	<0.02	<0.1	<0.02	<0.1	<0.1	0.16
P-10	<0.02	<0.1	<0.02	<0.1	<0.1	0.57
ID-7	<0.02	<0.1	<0.02	<0.1	<0.1	0.27
ID-10	<0.02	<0.1	<0.02	<0.1	<0.1	0.32

Respectfully,

Howard Holmes

Howard Holmes
Chemist

Reviewed by: SMD

PACIFIC ANALYTICAL LABORATORY inc.
9405 S.W. Nimbus Ave. Beaverton, OR 97005 (503) 644-0660

April 25, 1989

Brown & Caldwell
9620 SW Barbur Blvd., Suite 200
Portland, OR 97219

Attn: Russ Hamblin

PAL REPORT NUMBER: 89-0309
P.O./JOB NUMBER: 4488
DATE SUBMITTED: 4/18/89
ITEMS: One Water Sample - GW1
Two Soil Samples - BF1, BF2

ANALYSIS

METHODS: Total Metals per EPA 3050, 7000 series
Volatiles per EPA 602

Total Metals - mg/kg

	AE1	AE2
Cadmium	0.5	0.6
Chromium	590	440
Copper	100	85
Lead	2900	1800
Nickel	14	13
Zinc	90	85

Volatiles - ug/L

	GW1	Lab Blank
Benzene	400	ND
Toluene	20,000	ND
Ethyl Benzene	8,000	ND
Xylene	38,000	ND

ND = Not Detected

Respectfully,

Philip Nerenberg
Chemist

Linnet O'Hanlon
Chemist

PACIFIC ANALYTICAL LABORATORY inc.
9405 S.W. Nimbus Ave. Beaverton, OR 97005 (503) 644-0660

April 25, 1989

PEMCO
P.O. Box 11569
Portland, OR 97211
Attn: Tim Veley

PAL REPORT NUMBER: 89-0301
P.O./JOB NUMBER: 2032 (James River)
DATE SUBMITTED: 4/17/89
ITEMS: Eleven Soil Samples

METHOD: Modified EPA 3810 (GC/MS)
Results in mg/kg (ppm)

	P-1	P-2	P-3	P-4
Methanol	--	--	--	--
Ethanol	--	--	2	--
Acetone	--	--	--	--
2-Propanol	--	--	--	--
Methyl Isobutyl Ketone	--	--	--	--
1-Hexanol	--	--	--	--
2-Hexanol	--	--	--	--
Ethyl Acetate	--	--	--	--
1-Butanol	--	--	--	--
1-Propanol	--	--	--	--
Toluene	--	--	--	--

	P-5	P-6	P-7	P-8	P-9
Methanol	340	1200	2	90	--
Ethanol	2600	4200	13	1500	--
Acetone	21	33	1	--	--
2-Propanol	980	2000	2	440	--
Methyl Isobutyl Ketone	180	770	--	5	--
1-Hexanol	200	110	--	--	--
2-Hexanol	300	160	--	--	--
Ethyl Acetate	85	28	--	18	--
1-Butanol	240	370	--	--	--
1-Propanol	60	120	--	790	--
Toluene	--	--	--	1	--

2-Propanol = Isopropyl Alcohol
1-Propanol = Normal Propyl Alcohol

Respectfully,

Philip Nerenberg
Philip Nerenberg
Chemist

Reviewed by: JMO

cc: Brown and Caldwell

PACIFIC ANALYTICAL LABORATORY inc.

9405 S.W. Nimbus Ave. Beaverton, OR 97005 (503) 644-0660

April 27, 1989

PEMCO
P.O. Box 11569
Portland, OR 97211

Attn: Tim Veley

PAL REPORT NUMBER: 89-0301B
P.O/JOB NUMBER: 2032 (James River)
DATE SUBMITTED: 4/17/89
ITEMS: Two Soil Samples

ANALYSIS

METHOD: Modified EPA 3810 (GC/MS)

Results in mg/kg (ppm)

	P-10	P-11	Lab Blank	Detection Limit
Benzene	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl Benzene	ND	ND	ND	0.1
Xylene	0.6	0.3	ND	0.1
Volatile Petroleum Hydrocarbons	270*	160*	ND	1

ND = Not Detected

*Similar to extremely weathered gasoline.

Respectfully,

Philip Nerenberg
Chemist

Reviewed by: LMD

cc: Brown & Caldwell

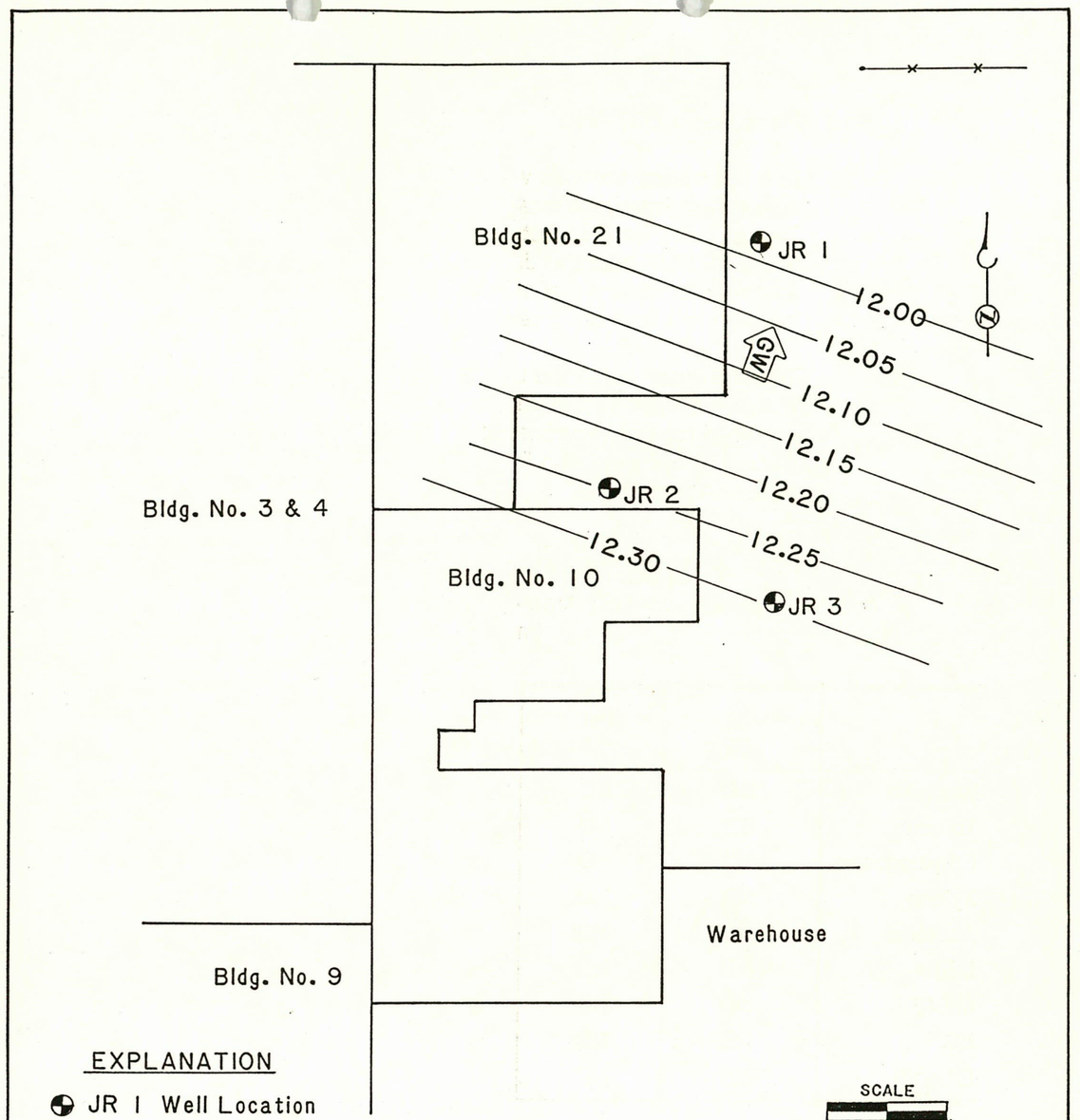


FIGURE 5-1
PRESS ROOM AREA
COATED PRODUCTS
GROUNDWATER ELEVATION CONTOUR MAP

9

5.1.1 Press Room UST Area

Five soil boring samples were collected during the Press Room UST area investigation and analyzed under EPA Method 3810 (Modified). Two samples were collected from boring JR-1 (JR-1S2 and JR-1S5) and JR-S3 (JR-3S2 and JR-3S5) at 2- and 5-foot intervals. One sample was obtained at 10 feet from boring JR-2 (JR-2S10) as the initial 10 feet was composed of non-native gravel fill.

Toluene occurred as the sole compound at concentrations slightly above detection limit in samples JR-1S2 and JR-3S2. Sample JR-2S10 exhibited toluene, acetone, methyl isobutyl ketone, and isopropyl alcohol above detection limits. Methyl ethyl ketone occurred at the detection limit.

Table 5-1. Soil Sample Analytical Results
Press Room UST Area - Coated Products Division
(mg/Kg)

	JR1 S2	JR1 S5	JR2 S10	JR3 S2	JR3 S5	DL[1]
Benzene	ND[2]	ND	ND	ND	ND	0.1
Toluene	0.3	ND	0.3	0.2	ND	0.1
Ethylbenzene	ND	ND	ND	ND	ND	0.1
Xylene	ND	ND	ND	ND	ND	0.1
Acetone	ND	ND	14	ND	ND	0.1
MEK[4]	ND	ND	1	ND	ND	1
MIBK[5]	ND	ND	9	ND	ND	2
IPA[6]	ND	ND	1,300	ND	ND	1
Ethanol	ND	ND	ND	ND	ND	2

[1] Detection limit
[2] Not detected
[3] Not analyzed
[4] Methyl Ethyl Ketone
[5] Methyl Isobutyl Ketone
[6] Isopropyl alcohol

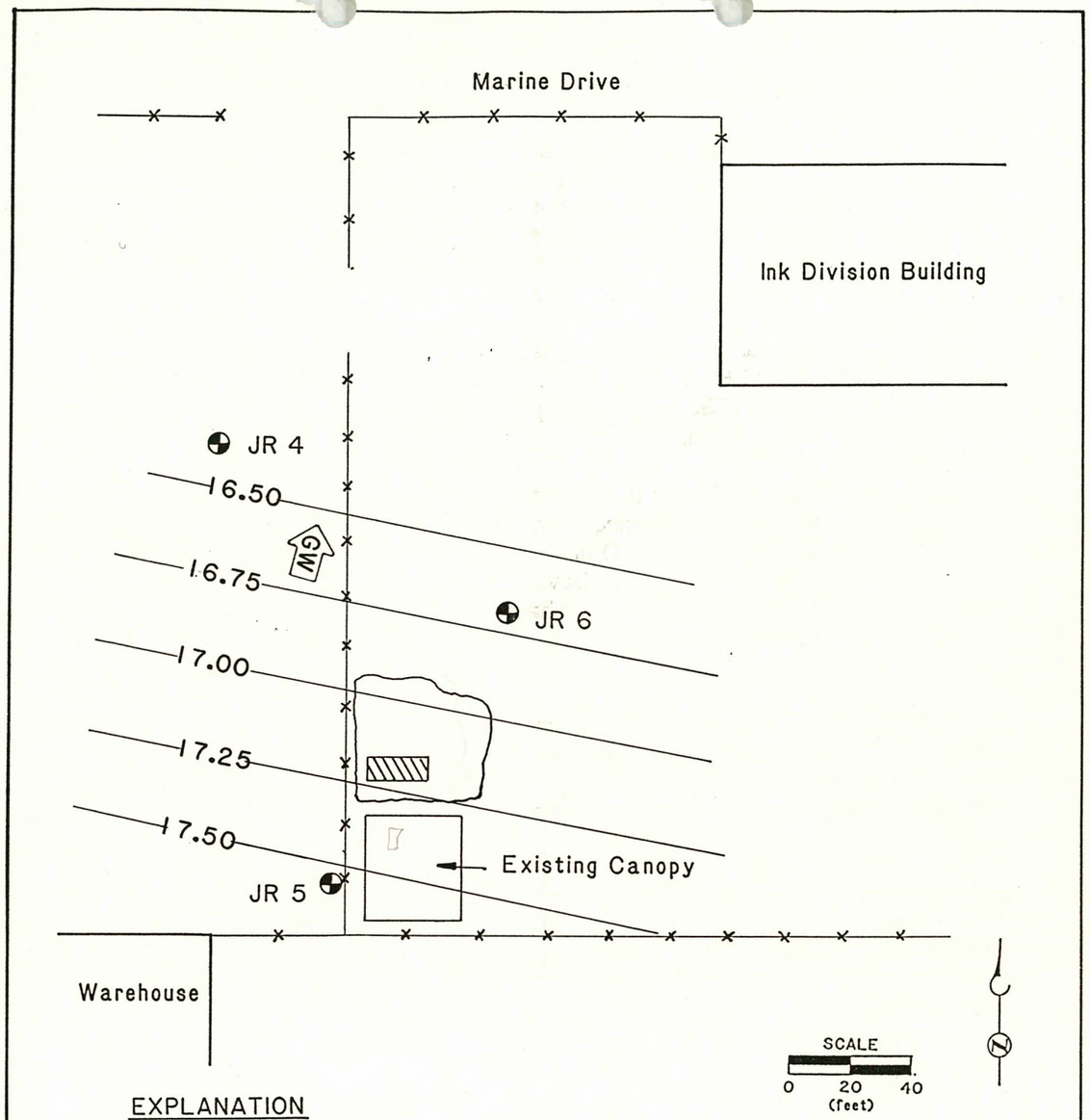


FIGURE 5-2
GASOLINE UST AREA
COATED PRODUCTS
GROUNDWATER ELEVATION CONTOUR MAP

10

5.1.2 Gasoline UST Area

Five boring samples were collected during the Gasoline UST area investigation. Two soil samples were obtained from the 2- and 5-foot intervals from borings JR-5 (JR-6S2 and JR-6S5) and JR-6 (JR-652 and JR-6S5). One sample (JR-4S5) was obtained from boring JR-4 at the 5-feet interval due to the presence of non-native ground fill from 0 to 5 feet below ground surface (bgs).

The samples were analyzed for total petroleum hydrocarbons (TPH) under EPA Method 418.1. In addition, three of the five samples (JR-5S2, JR-5S5, and JR-6S2) were analyzed for hydrocarbon identification.

Total petroleum hydrocarbon occurred well above detection limits in the samples, ranging from 17 mg/kg (JR-4S5) to 360 mg/kg (JR-6S2). The hydrocarbon ID analysis did not indicate the presence of hydrocarbons at or above detection limits. The analysis was performed to evaluate what fraction of the corresponding TPH levels were present as gasoline constituents.

Table 5-2. Soil Sample Analytical Results
Gasoline UST Area - Coated Products Division

	JR4 S5	JR5 S2	JR5 S5	JR6 S2	JR6 S5	DL[1]
TPH[2]	17	140	100	360	17	5
HCID (C_6-C_{25})[3]	NA[4]	ND[5]	ND	ND	NA	10-40

[1] Detection limit
[2] Total Petroleum hydrocarbon
[3] Hydrocarbon ID
[4] Not analyzed
[5] Not detected

7.0 CONCLUSIONS AND RECOMMENDATIONS

The purpose of this CAP is to present and summarize current and historical investigative data, compare the data in relation to DEQ cleanup requirements, and propose a course of action that would lead to final closure of the sites of concern. The course of action during the past 2 1/2 years has been passive remediation and quarterly groundwater monitoring to document trends in constituent concentrations and water levels. Based on the results of this CAP, it appears that continuing with passive remediation and quarterly groundwater monitoring are the appropriate recommendations. These recommendations are based on the following conclusions:

- The main sources of contamination have been removed from both areas during previous UST decommissioning and associated soil removal activities.

- There are no beneficial users of the shallow aquifer hydraulically downgradient of the James River site within one mile. The City of Portland is supplied drinking water by a municipal system. Therefore, no potable uses of the shallow groundwater aquifer are anticipated in the immediate area.

- Monitoring during the last 2 1/2 years has indicated decreases in chemical concentrations in the Press Room UST area to nondetectable concentrations. BTEX concentrations in the Gasoline UST area have been on a consistent downward trend.

- None of the chemical constituents of concern have been detected in downgradient wells, indicating no evidence of wide spread contaminant migration from original sources.

- The analytical results of the VETs indicated the presence of only relatively low to moderate chemical concentrations in the vadose zone of each area.

Based on these finding, SEACOR further recommendation soil sampling in each area to determine the degree and extent of impact to remaining soils. Prior to issuing a letter of closure for these two areas at the JRC facility, the DEQ will most likely require documentation presenting evidence that no significant contaminant source remains in the soils in either the Press Room and Gasoline UST areas.

If the soil sampling results indicate that significant sources of contamination remain in either area, SEACOR will submit a Scope of Work supplement to the CAP with an appropriate course of action. If impacted soils do exist in one or both areas, rising water levels may mix with the contaminants in the vadose zone and appear as dissolved compounds in the shallow groundwater, resulting in increases of constituent concentrations.

8.0 LIMITATIONS

This report has been prepared for use by James River Corporation for their evaluation of subsurface contamination at the Portland facility. This report may be made available to potential buyers of the property and to regulatory agencies. The report is not intended for use by others and the information contained herein is not applicable to other sites.

The data reported herein are based on SEACOR's observations during the various investigation and remedial activities, as well as laboratory analysis of soil and groundwater samples from the site. This report was prepared in accordance with generally accepted standards of environmental and geological practices in Oregon at the time of the investigation. The investigation was conducted solely to evaluate environmental conditions of the soil and groundwater for the referenced contaminants. No soil engineering or geotechnical references are implied or inferred. Subsurface conditions may vary away from the available data points.

APPENDIX A
LABORATORY ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY RECORDS
QUARTERLY GROUNDWATER MONITORING

NET NATIONAL ENVIRONMENTAL TESTING, INC.

24666. 10200

CHAIN OF CUSTODY RECORD

PORTLAND DIVISION, 17400 SW UPPER BOONES FERRY RD., SUITE 260, PORTLAND, OR 97224
(503) 624-5449 PHONE (503) 639-6889 FAX

David Samples

COMPANY SEACOR, INC
ADDRESS P.O. Box 1508
PHONE 503-691-2030 FAX 692-7274
PROJECT NAME/LOCATION James River
PROJECT NUMBER For 75-001-01
PROJECT MANAGER Russ Hamblin

SAMPLED BY

(PRINT NAME) _____ SIGNATURE _____

(PRINT NAME) _____ SIGNATURE _____

TURNAROUND TIME 10 DAY (S)

DATE	TIME	SAMPLE ID/DESCRIPTION	GRAB	COMP	# OF CONTAINERS	MATRIX	PRESERVED Y/N	ANALYSES: EPA 8240 + ALCOHOLS	EPA 8020	EPA 8010 EDB-EDC	EPA 7421 Diss. Pb	COMMENTS
10-7-97		100792-1	✓		7	H_2O	HCl	X X				Lite Bottles are NOT Preserved this are For ALcohol analysis & Dissolved Pb.
		100792-2	✓		7			X X				
		100792-3	✓		7			X X				
		100792-4	✓		7				X X		X	
		100792-5	✓		7				X X		X	
		100792-6	✓		7				X X		X	
		100792-7	✓		3				X			
		100792-8	✓		3				X			
		100792-9	✓		3	↓	↓		X			

RESULTS TO: Russ Hamblin

INVOICE TO: SEACOR

RELINQUISHED BY:	DATE/TIME	RECEIVED BY:	RELINQUISHED BY:	DATE/TIME	RECEIVED BY:
David Samples	10-8-97 900	10/8-97 9:00			
RELINQUISHED BY:	DATE/TIME	RECEIVED BY:	RELINQUISHED BY:	DATE/TIME	RECEIVED FOR LABORATORY BY:

METHOD OF SHIPMENT

REMARKS: Need to be filtered - no preservatives.

PT 1 - ORIGINAL - WHITE PT 2 - NET PROJECT MANAGER - YELLOW PT 3 - CUSTOMER COPY - PINK

NET Pacific, Inc.

KEY TO ABBREVIATIONS AND METHOD REFERENCES

Note	:	Reporting Limits are a function of the dilution factor for any given sample. To obtain the actual reporting limits for this sample, multiply the stated Reporting Limits by the dilution factor, (but do not multiply reported values).
<	:	Less than; When appearing in results column indicate analyte not detected at the value following. This datum supersedes the listed Reporting Limit.
mean	:	Average; sum of measurements divided by number of measurements.
mg/Kg (ppm)	:	Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis (parts per million).
ug/Kg (ppb)	:	Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis (parts per billion).
umhos/cm	:	Micromhos per centimeter.
N/A	:	Not applicable.
NA	:	Not analyzed.
ND	:	Not detected; the analyte concentration is less than applicable listed reporting limit.
DF	:	Dilution Factor.
NTU	:	Nephelometric turbidity units.
RPD	:	Relative percent difference, 100 [Value 1 - Value 2]/mean value.
SNA	:	Standard not available.

Method References

Methods 100 through 493: see "Methods for Chemical Analysis of Water & Wastes", U.S. EPA, 600/4-79-020, rev 1983.

Methods 601 through 625: see "Guidelines Establishing Test Procedures for the Analysis of Pollutants" U.S. EPA, 40 CFR, Part 136, rev. 1988.

Methods 1000 through 9999: see "Test Methods for Evaluation solid Waste", U.S. EPA SW-846, 3rd edition, 1986.

SM: see "Standard Methods for the Examination of Water & Wastewater", 16th Edition, APHA, 1985.

NATIONAL ENVIRONMENTAL TESTING, INC.

Portland Division
17400 SW Upper Boones Ferry Rd
Suite #260
Portland, OR 97224
Tel: (503) 624-5449
Fax: (503) 639-6889

Russ Hamblin
SEACOR Environmental Eng.
P.O. Box 1508
Tualatin, OR 97062

Date: 10/22/1992
NET Client Acct. No: 15250
NET Pacific Job No: 92.24666
Received: 10/08/1992

Project: F0075-001-01
Location: James River

Dear Mr. Russ Hamblin:

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Please refer to the enclosed "Key to Abbreviations" for definition of terms. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Approved by:

Kent Patton
Portland Division Manager

Enclosure(s)

NET Pacific, Inc.

SEACOR Environmental Eng.
Tualatin, OR 97062

NET Log: 92.24666
Date: 10/22/1992

Project: F0075-001-01
Location: James River
Contact: Russ Hamblin
Matrix: Water

Sample Number:				12790	12791	12792
Sample Description:				100792-1	100792-2	100792-3
Date Sampled:				10/07/1992	10/07/1992	10/07/1992
Parameter	Method	Report Limit	Units	Results	Results	Results
8240 VOLATILES/PURGEABLES						
Date Analyzed		-		10/13/92	10/13/92	10/13/92
Dilution Factor		-		1	1	1
Acetone	8240	10	ug/L	ND	ND	ND
Benzene	8240	5	ug/L	ND	ND	ND
Bromodichloromethane	8240	5	ug/L	ND	ND	ND
Bromoform	8240	5	ug/L	ND	ND	ND
Bromomethane	8240	10	ug/L	ND	ND	ND
2-Butanone	8240	20	ug/L	ND	ND	ND
Carbon disulfide	8240	5	ug/L	ND	ND	ND
Carbon tetrachloride	8240	5	ug/L	ND	ND	ND
Chlorobenzene	8240	5	ug/L	ND	ND	ND
Chloroethane	8240	10	ug/L	ND	ND	ND
2-Chloroethylvinyl ether	8240	20	ug/L	ND	ND	ND
Chloroform	8240	10	ug/L	ND	ND	ND
Chloromethane	8240	10	ug/L	ND	ND	ND
Dibromochloromethane	8240	5	ug/L	ND	ND	ND
1,2-Dichlorobenzene	8240	5	ug/L	ND	ND	ND
1,3-Dichlorobenzene	8240	5	ug/L	ND	ND	ND
1,4-Dichlorobenzene	8240	5	ug/L	ND	ND	ND
1,1-Dichloroethane	8240	5	ug/L	ND	ND	ND
1,2-Dichloroethane	8240	5	ug/L	ND	ND	ND
1,1-Dichloroethene	8240	5	ug/L	ND	ND	ND
trans-1,2-Dichloroethene	8240	5	ug/L	ND	ND	ND
1,2-Dichloropropane	8240	5	ug/L	ND	ND	ND
cis-1,3-Dichloropropene	8240	5	ug/L	ND	ND	ND
trans-1,3-Dichloropropene	8240	5	ug/L	ND	ND	ND
Ethylbenzene	8240	5	ug/L	ND	ND	ND
2-Hexanone	8240	20	ug/L	ND	ND	ND

NET Pacific, Inc.

SEACOR Environmental Eng.
Tualatin, OR 97062

NET Log: 92.24666
Date: 10/22/1992

Project: F0075-001-01
Location: James River
Contact: Russ Hamblin
Matrix: Water

Sample Number:				12790	12791	12792
Sample Description:				100792-1	100792-2	100792-3
Date Sampled:				10/07/1992	10/07/1992	10/07/1992
Parameter	Method	Report Limit	Units	Results	Results	Results
Methylene chloride	8240	5	ug/L	ND	ND	ND
4-Methyl-2-pentanone	8240	5	ug/L	ND	ND	ND
Styrene	8240	5	ug/L	ND	ND	ND
1,1,2,2-Tetrachloroethane	8240	5	ug/L	ND	ND	ND
Tetrachloroethene	8240	5	ug/L	ND	ND	ND
Toluene	8240	5	ug/L	ND	ND	ND
1,1,1-Trichloroethane	8240	5	ug/L	ND	ND	ND
1,1,2-Trichloroethane	8240	5	ug/L	ND	ND	ND
Trichloroethene	8240	5	ug/L	ND	ND	ND
Vinyl acetate	8240	5	ug/L	ND	ND	ND
Vinyl chloride	8240	10	ug/L	ND	ND	ND
Xylenes, total	8240	5	ug/L	ND	ND	ND
Surrogate Recovery						
Toluene-d8	8240	-	%	101	102	102
Bromofluorobenzene	8240	-	%	88	86	90
1,2-Dichloroethane-d4	8240	-	%	105	106	104

NET Pacific, Inc.

SEACOR Environmental Eng.
Tualatin, OR 97062

NET Log: 92.24666
Date: 10/22/1992

Project: F0075-001-01
Location: James River
Contact: Russ Hamblin
Matrix: Water

Sample Number:				12790	12791	12792
Sample Description:				100792-1	100792-2	100792-3
Date Sampled:				10/07/1992	10/07/1992	10/07/1992
Parameter	**Method**	**Report Limit**	**Units**	**Results**	**Results**	**Results**
Date Analyzed		-		10/14/92	10/14/92	10/14/92
Ethanol	GC/FID	1.0	mg/L	ND	ND	ND
Isopropyl Alcohol	GC/FID	1.0	mg/L	ND	ND	ND
Methanol	GC/FID	1.0	mg/L	ND	ND	ND

NET Pacific, Inc.

SEACOR Environmental Eng.
Tualatin, OR 97062

NET Log: 92.24666
Date: 10/22/1992

Project: F0075-001-01
Location: James River
Contact: Russ Hamblin
Matrix: Water

Received: 10/08/1992
Extracted: 10/15/1992

METHOD: EPA 7421
Reporting Limit: 0.005 mg/L

Lead, diss. (GFAA)

Sample Number	Sample ID	Test Results	Units	Date Analyzed	Date Sampled
12793	100792-4	ND	mg/L	10/19/1992	10/07/1992
12794	100792-5	ND	mg/L	10/19/1992	10/07/1992
12795	100792-6	0.032	mg/L	10/19/1992	10/07/1992

NET Pacific, Inc.

SEACOR Environmental Eng.
Tualatin, OR 97062

NET Log: 92.24666
Date: 10/22/1992

Project: F0075-001-01
Location: James River
Contact: Russ Hamblin
Matrix: Water

Sample Number:	12793	12794	12795
Sample Description:	100792-4	100792-5	100792-6
Date Sampled:	10/07/1992	10/07/1992	10/07/1992

Parameter	Method	Report Limit	Units	Results	Results	Results
EDB & EDC by 8010 (W)						
Date Analyzed		-		10/12/92	10/12/92	10/12/92
Dilution Factor		-		1	1	1
Ethylene Dibromide	8010	1	ug/L	ND	ND	ND
Ethylene Dichloride	8010	0.5	ug/L	ND	ND	ND
Surrogate Recovery						
2-Br-1-Cl-Propane		-	%	117	103	117

NET Pacific, Inc.

SEACOR Environmental Eng.
Tualatin, OR 97062

NET Log: 92.24666
Date: 10/22/1992

Project: F0075-001-01
Location: James River
Contact: Russ Hamblin
Matrix: Water

Sample Number:				12793	12794	12795	12796	12797	12798
Sample Description:				100792-4	100792-5	100792-6	100792-7	100792-8	100792-9
Date Sampled:				10/07/1992	10/07/1992	10/07/1992	10/07/1992	10/07/1992	10/07/19
Parameter	Method	Report Limit	Units	Results	Results	Results	Results	Results	Results
BTEX (W)									
Date Analyzed		-		10/12/92	10/12/92	10/12/92	10/12/92	10/12/92	10/12/92
Dilution Factor		-		1	1	1	1	1	1
Benzene	8020	0.5	ug/L	ND	17	ND	50	ND	ND
Toluene	8020	0.5	ug/L	ND	ND	ND	2	ND	ND
Ethylbenzene	8020	0.5	ug/L	ND	ND	ND	1	ND	ND
Xylenes	8020	0.5	ug/L	ND	3	ND	6	2	ND
Surrogate Recovery									
aaa-Trifluorotoluene	8020	-	%	95	94	97	106	96	100

NET Pacific, Inc.

Client Acct: 15250 Date: 10/22/1992
Client Name: SEACOR Environmental Eng. Page: 8
NET Job No: 92.24666

Ref: F0075-001-01

QUALITY CONTROL DATA

Parameter	Reporting Limits	Units	Cal Verf Stand % Recovery	Blank Data	Spike % Recovery	Duplicate Spike % Recovery	RPD
Benzene	0.5	ug/L	88	ND	84	86	2.4
Toluene	0.5	ug/L	96	ND	82	90	9.3
Ethylbenzene	0.5	ug/L	93	ND	83	90	8.1
Xylene	0.5	ug/L	90	ND	83	89	7.1
1,2-DCA	0.5	ug/L	102	ND	92	94	2.2
EDB	1.0	ug/L	117	ND	101	112	10.3
Lead, GFAA	0.005	mg/L	100	ND	90	108	18.2
Isopropyl Alc.	1.0	mg/L	97	ND	102	102	<1.0
Methanol	1.0	mg/L	104	ND	110	110	<1.0
Ethanol	1.0	mg/L	96	ND	100	98	2.2
1,1-DCE	5	ug/L	108	ND	98	99	1.1
TCE	5	ug/L	121	ND	94	95	1.1
Benzene (8240)	5	ug/L	116	ND	102	103	<1.0
Toluene (8240)	5	ug/L	113	ND	96	97	1.4
CL Benzene	5	ug/L	116	ND	103	101	2.0

APPENDIX B
VAPOR EXTRACTION TEST DATA

VAPOR EXTRACTION TEST DATA

Job No.: Fco15-001-02 Site Name: JRC - Press Room Area Date: 11-17-12

VET WELL: JR-1 FLOW RATE: _____

			READINGS			
G.W. LEVEL	TIME	TIME ELAPSED	PID	LEL (%)	LEL (ppm)	VACUUM (in.of H_2O)
16.68	10:32 Residual	–	0			0.05
	11:16	10	0			0.0
	11:26	20	0			0.0
	11:36	30	0			0.0
	11:46	40	0			0.0
	11:56	50	0			0.0
	12:06	60	0			0.0
	12:26	80	0			0.0
	12:46	100	0			0.0
	13:06	120	0			0.0
	13:36	150	0			0.0
	14:06	180	0			0.0
	14:36	210	0			0.0
	15:06	240	0			0.0
16.70	15:10					

VAPOR EXTRACTION TEST DATA

Job No.: Foo15-001-02 Site Name: JR2 - Press Room Area Date: 11-17-12

VET WELL: JR-2 FLOW RATE: _____

Test Well			READINGS			
G.W. LEVEL	TIME	TIME ELAPSED	PID	LEL (%)	LEL (ppm)	VACUUM (in.of H_2O)
16.38	10:32 Residual	-	0			0.0
	11:05	—	1.4			55
	11:15	10	0.0			53
	11:25	20	3.0			50
	11:35	30	4.0			50
	11:45	40	4.1			50
	11:55	50	2.9			50
	12:05	60	2.4			50
	12:25	80	0			50
	12:45	100	0			50
	13:05	120	0			50
	13:35	150	0			50
	14:05	180	0			50
	14:35	210	0			50
	15:05	240	0			50
14.20	15:10					

VAPOR EXTRACTION TEST DATA

Job No.: Foo15-001-02 Site Name: JDC-Press Room Area Date: 4-17-92

VET WELL: JR-3 FLOW RATE: _____

			READINGS			
G.W. LEVEL	TIME	TIME ELAPSED	PID	LEL (%)	LEL (ppm)	VACUUM (in.of H_2O)
14.04	10:32 Residual	—	0			0.0
	11:17	10				0.02
	11:27	20	0			0 0
	11:37	30	0			0.04
	11:47	40	0			0 02
	11:57	50	0			0 03
	12:07	60	0			0.04
	12:27	80	0			0.07
	12:47	100	0			0.05
	13:07	120	0			0.00
	13:37	150	0			0 03
	14:07	180	0			0.05
	14:37	210	0			0.06
	15:07	240	0			0 03
14:04	15:10		—			—

VAPOR EXTRACTION TEST DATA

Job No.: F0015-001-02 Site Name: JRC - GAS UST AREA Date: 11-15-92

VET WELL: JR-5 FLOW RATE: _____

TEST WELL

G.W. LEVEL	TIME	TIME ELAPSED	READINGS PID	LEL (%)	LEL (ppm)	VACUUM (in. of H_2O)
11.86	Residual	0	0			0.01
	9:10	—	6			39
	9:15	5	17			40
	9:20	10	00			40
	9:25	15	54			40
	9:30	20	60			40
	9:35	25				*
	9:40	30	66			41
	9:45	35	75			40
	9:50	40	83			40
	9:55	45	91			40
--	10:00	50	94			40
	10:05	55	99			39 xx
	10:10	60	106			41
	10:15	65	110			41
	10:30	80	118			40
	10:50	100	126			40
	11:10	120	132			40
	11:40	150	140			40
	12:10	180	142			40
	12:40	210	145			40
10:44	13:10	240	145			40

* 9:31 Power Lost at outlet 9:37 Power on

xx Hole noted in intake hose of Pump near well head, PSI had dropped to 39, After Patching PSI returned to 40-41 ppm went From 99 to 106

VAPOR EXTRACTION TEST DATA

Job No.: Fa15-001-02 Site Name: JRC - Gas Sta Area Date: 11-18-92

VET WELL: JR-4 FLOW RATE: _____

			READINGS			
G.W. LEVEL	TIME	TIME ELAPSED	PID	LEL (%)	LEL (ppm)	VACUUM (in.of H_2O)
13.80	Residual	—	0.			0.01
	9:23					0.01
	9:40	30	0			0.02
	9:53	43	0			0.0
	10:02	52	0			0.0
	10:12	62	0			0.0
	10:32	82	0			0.0
	10:52	102	0			0.0
	11:12	122	0			0.0
	11:42	152	0			0.0
	12:12	182	0			0.0
	12:42	212	0			0.0
	13:12	242	0			0.0
13.78						

VAPOR EXTRACTION TEST DATA

Job No.: F0075-001-02 Site Name: JRL- GAS UST AREA Date: 11-18-92

VET WELL: JR-6 FLOW RATE: _____

			READINGS			
G.W. LEVEL	TIME	TIME ELAPSED	PID	LEL (%)	LEL (ppm)	VACUUM (in.of H_2O)
13.74	Residual	–	0			0
	9:25		0			0.025
	9:45	35	0			0.02
	9:55	45	0			0.02
	10:04	54	0			0.02
	10:14	64	0			0.0
	10:34	84	0			0.04
	10:54	104	0			0.04
	11:14	124	0			0.04
	11:44	154	0			0.04
	12:14	184	0			0.00 *
	12:44	214	0			0.03
13.68	13:14	244	0			0.02

* Loss of Power Source a couple of times due to circuit breaker overload

APPENDIX C
LABORATORY ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY RECORDS
VAPOR EXTRACTION TEST SAMPLES

NET Pacific, Inc.

17400 SW Upper Boones Ferry Rd.
Suite 260
Portland, OR 97224

TEL: 503-620-7474
FAX: 503-639-6889

SEACOR

RECEIVED DEC 03 1992

CHAIN OF CUSTODY RECORD

PROJ. NO.

PROJECT NAME: James River

SAMPLERS: (Signature) David Samples / Mark Trecwarthe

NET LOG NUMBER: 24793.15250

STA. NO.	DATE	TIME	COMP.	GRAB	Matrix	STATION LOCATION	NO. OF CONTAINERS	Volatile Organics EPA-624 Alcohols - MEBK purge trap or equivalents	Comments/Instructions
	11/19/92	13:05			GAS	JR-2-1	1	X X	
		13:05				JR-2-1 duplicate	1	X X	
		15:15				JR-2-2	1	X X	
		15:15				JR-2-2 duplicate	1	X X	

Relinquished by: (Signature)	Date / Time	Received by: (Signature)
D. Samples	11/19/92	D. Samples
Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) John Swanson — 11/19/92 1650

Report Results To:

Phone: Russ Hamblin

Bill To: James River

Reference P.O. Number:

Remarks

NET Pacific, Inc.

SEACOR

Suite 260
Portland, OR 97224

FAX: 503-639-6009

CHAIN OF CUSTODY RECORD

PROJ. NO. F0075-001 -02

PROJECT NAME: James River

SAMPLERS: (Signature) Mark Tnewortha / David Samples

NET LOG NUMBER: JHA91 15250

Normal TAT

STA. NO.	DATE	TIME	COMP.	GRAB	Matrix	STATION LOCATION	NO. OF CONTAINERS	BTEX 8020	TPH as Gasoline	Comments/Instructions
	11/18/92	11:10		✓	Gas	JR-5-1	1	✓	✓	
		11:10		✓	"	JR-5-1 Duplicate	1	✓	✓	
		13:40		✓	"	JR-5-2	1	✓	✓	
		13:40		✓	"	JR-5-2 Duplicate	1	✓	✓	

Relinquished by: (Signature)	Date / Time	Received by: (Signature)
D. Samples	11/18/92 4:30	
Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)
		Randy T. McKee

Report Results To:

Phone: Russ Hamblin or Mark Tnewortha

Bill To: James River

Reference P.O. Number:

Date / Time	Remarks
11/18/92 4:30	

NATIONAL ENVIRONMENTAL TESTING, INC.

Portland Division
17400 SW Upper Boones Ferry Rd.
Suite #260
Portland, OR 97224
Tel: (503) 624-5449
Fax: (503) 639-6889

RECEIVED DEC 0 8 1992

Russ Hamblin
SEACOR Environmental Eng.
P.O. Box 1508
Tualatin, OR 97062-1508

Date: 12/04/1992
NET Client Acct. No: 15250
NET Pacific Job No: 92.24793
Received: 11/19/1992

Project: James River

Dear Mr. Russ Hamblin:

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Please refer to the enclosed "Key to Abbreviations" for definition of terms. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Approved by:

Kent Patton
Portland Division Manager

Enclosure(s)

SEACOR Environmental Eng.
Tualatin, OR 97062-1508

NET Log: 92.24793
Date: 12/04/1992

Project: James River
Contact: Russ Hamblin
Matrix: Air

Sample Number:	13419	13420	N/A
Sample Description:	JR-2-1	JR-2-2	Blank
Date Sampled:	11/19/1992	11/19/1992	N/A

Parameter	Method	Report Limit	Units	Results	Results	Results
EPA METHOD TO-14 GC/MS FULL SCAN						
Date Analyzed		-		11/21/92	11/21/92	11/21/92
Dilution Factor		-		4	4	1
Chloromethane	TO-14	2.0	ppbv	ND	ND	ND
Bromomethane	TO-14	2.0	ppbv	ND	ND	ND
Vinyl chloride	TO-14	2.0	ppbv	270	380	ND
Chloroethane	TO-14	2.0	ppbv	340	360	ND
Carbon Disulfide	TO-14	2.0	ppbv	ND	ND	ND
Acetone	TO-14	2.0	ppbv	20	28	ND
Vinyl Acetone	TO-14	2.0	ppbv	ND	ND	ND
2-Butanone	TO-14	2.0	ppbv	ND	ND	ND
Chloroform	TO-14	2.0	ppbv	ND	ND	ND
Benzene	TO-14	2.0	ppbv	7.2	20	ND
Methylene chloride	TO-14	2.0	ppbv	14	14	ND
Trichlorofluoromethane	TO-14	2.0	ppbv	ND	ND	ND
1,1-Dichloroethene	TO-14	2.0	ppbv	ND	3.9	ND
1,1-Dichloroethane	TO-14	2.0	ppbv	120	130	ND
trans-1,2-Dichloroethene	TO-14	2.0	ppbv	ND	ND	ND
cis-1,2-Dichloroethene	TO-14	2.0	ppbv	35	45	ND
Chloroform	TO-14	2.0	ppbv	ND	ND	ND
1,2-Dichloroethane	TO-14	2.0	ppbv	ND	ND	ND
1,1,1-Trichloróethane	TO-14	2.0	ppbv	71	95	ND
Carbon Tetrachloride	TO-14	2.0	ppbv	ND	ND	ND
Bromodichloromethane	TO-14	2.0	ppbv	ND	ND	ND
1,2-Dichloropropane	TO-14	2.0	ppbv	ND	ND	ND
trans-1,3-Dichloropropene	TO-14	2.0	ppbv	ND	ND	ND
Trichloroethene	TO-14	2.0	ppbv	14	18	ND
Dibromochloromethane	TO-14	2.0	ppbv	ND	ND	ND
1,1,2-Trichloroethane	TO-14	2.0	ppbv	ND	ND	ND
cis-1,3-Dichloropropene	TO-14	2.0	ppbv	ND	ND	ND
Bromoform	TO-14	2.0	ppbv	ND	ND	ND
1,1,2,2-Tetrachloroethane	TO-14	2.0	ppbv	ND	ND	ND
Tetrachloroethene	TO-14	2.0	ppbv	170	230	ND
Chlorobenzene	TO-14	2.0	ppbv	ND	ND	ND
1,3-Dichlorobenzene	TO-14	2.0	ppbv	ND	ND	ND

SEACOR Environmental Eng.
Tualatin, OR 97062-1508

NET Log: 92.24793
Date: 12/04/1992

Project: James River
Contact: Russ Hamblin
Matrix: Air

Sample Number:	13419	13420	N/A
Sample Description:	JR-2-1	JR-2-2	Blank
Date Sampled:	11/19/1992	11/19/1992	N/A

Parameter	Method	Report Limit	Units	Results	Results	Results
1,2-Dichlorobenzene	TO-14	2.0	ppbv	ND	ND	ND
1,4-Dichlorobenzene	TO-14	2.0	ppbv	ND	ND	ND
4-Methyl-2-Pentanone	TO-14	2.0	ppbv	ND	ND	ND
Toluene	TO-14	2.0	ppbv	23	49	ND
2-Hexanone	TO-14	2.0	ppbv	ND	ND	ND
Ethyl Benzene	TO-14	2.0	ppbv	15	18	ND
Xylene	TO-14	2.0	ppbv	67	80	ND
Styrene	TO-14	2.0	ppbv	7.1	7.7	ND
Ethanol	TO-14	4.0	ppbv	ND	ND	ND
Methanol	TO-14	4.0	ppbv	190	160	ND
Iso-Propanol	TO-14	4.0	ppbv	8.8	7.7	ND
Surrogate Recovery						
1,2-Dichloroethane-d4	TO-14	-	%	94	106	91
Toluene-d8	TO-14	-	%	101	105	94
4-Bromofluorobenzene	TO-14	-	%	95	97	100

NET®

SEACOR Environmental Eng.
Tualatin, OR 97062-1508

NET Log: 92.24791
Date: 11/25/1992

RECEIVED DEC 0 8 1992

Project: F0075-001-02
Location: James River
Contact: Russ Hamblin
Matrix: Air

Sample Number:				13413	13414	13415
Sample Description:				JR-5-1	JR-5-1 Dup	JR-5-2
Date Sampled:				11/18/1992	11/18/1992	11/18/1992
Parameter	**Method**	**Report Limit**	**Units**	**Results**	**Results**	**Results**
BTEX & TPH-Gas by PID/FID (A)						
Date Analyzed		-		11/19/92	11/19/92	11/19/92
Dilution Factor		-		1	1	1
Benzene	8020	0.15	ppmv	0.5	0.5	0.4
Toluene	8020	0.13	ppmv	2	2	2
Ethylbenzene	8020	0.11	ppmv	0.8	0.9	0.8
Xylene	8020	0.11	ppmv	8	8	8
TPH-Gas	8015M	12.5	ppmv	200	200	170
Surrogate Recovery						
aaa-Trifluorotoluene (BTEX)		-	%	98	107	97
aaa-Trifluorotoluene (Gas)		-	%	112	111	101

NET®KEY TO ABBREVIATIONS AND METHOD REFERENCES

ote	:	Reporting Limits are a function of the dilution factor for any given sample. To obtain the actual reporting limits for this sample, multiply the stated Reporting Limits by the dilution factor, (but do not multiply reported values).
	:	Less than; When appearing in results column indicate analyte not detected at the value following. This datum supersedes the listed Reporting Limit.
ean	:	Average; sum of measurements divided by number of measurements.
g/Kg (ppm)	:	Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis (parts per million).
g/Kg (ppb)	:	Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis (parts per billion).
mhos/cm	:	Micromhos per centimeter.
I/A	:	Not applicable.
IA	:	Not analyzed.
ID	:	Not detected; the analyte concentration is less than applicable listed reporting limit.
)F	:	Dilution Factor.
ITU	:	Nephelometric turbidity units.
RPD	:	Relative percent difference, 100 [Value 1 - Value 2]/mean value.
SNA	:	Standard not available.

Method References

Methods 100 through 493: see "Methods for Chemical Analysis of Water & Wastes", U.S. EPA, 600/4-79-020, rev 1983.

Methods 601 through 625: see "Guidelines Establishing Test Procedures for the Analysis of Pollutants" U.S. EPA, 40 CFR, Part 136, rev. 1988.

Methods 1000 through 9999: see "Test Methods for Evaluation solid Waste", U.S. EPA SW-846, 3rd edition, 1986.

SM: see "Standard Methods for the Examination of Water & Wastewater", 16th Edition, APHA, 1985.

JAMES RIVER CORPORATION

PACKAGING BUSINESS

3400 N. Marine Drive, Portland, OR 97217-7746

Mailing Address: P.O. Box 17128, Portland, OR 97217-0128

DAVID L. ERNST

Site Maintenance & Environmental Mgr.

Flexible Packaging Group

503-286-1621

10/14/92 9:00 AM

26-89-064

Meeting with Dave Ernst on James River - Flex Pkg

We discussed the status of remaining tanks at the site. We resolved UST permitting issues for GTI, facility # 3136 - Barb Nation will update records and invoice GTI.

We looked over the draft report on GW monitoring. Acetone and Alcohol levels had dropped drastically, though detection limits are inconsistent. Past 2-3 events done by ND. Gasoline area showed reductions, but still exceeds Benzene standard.

I asked for the final report within ≈ 2 weeks to allow me to review/update the file with current information.

Loren G. Garner

JAMES RIVER CORPORATION

SOIL AND GROUNDWATER INVESTIGATION
COATED PRODUCTS DIVISION
PORTLAND, OREGON

NOVEMBER 13, 1989

5.2 Groundwater Analytical Results

5.2.1 Press Room UST Area

Five groundwater samples were collected during the Press Room UST area investigation. These included samples JR-1, JR-2, and JR-3 which were collected from the respective monitoring wells, JR-20 (duplicate of JR-2), and JR-23 (transport blank). The samples were analyzed under EPA Method 8240 by Pacific Analytical Laboratory in Beaverton, Oregon. The analytical results are included in the complete laboratory data reports in Appendix C-2.

Sample JR-2 exhibited acetone, methyl isobutyl ketone, and isopropanol at concentrations of 1,500 ppb, 440 ppb, and 7,800 ppb, respectively. The JR-2 duplicate sample, JR-20, exhibited similar results. No compounds were detected at or above detection limits in samples JR-1, JR-3, and JR-23 (transport blank).

5.2.2 Gasoline UST Area

Five groundwater samples were collected during the Gasoline UST Area investigation. These included samples from the respective monitoring wells (JR-4, JR-5, JR-6), a sample duplicate of JR-6 (JR-21), and a transport blank (JR-24). The samples were analyzed under EPA Method 8020 by Pacific Analytical Laboratory in Beaverton, Oregon. The analytical results are included in the complete laboratory data report in Appendix C-2.

Benzene, toluene, and xylene occurred at 120 ppb, 14 ppb, and 960 ppb, respectively, in sample JR-5. No volatile organic compounds were detected at or above detection limits in samples JR-4, JR-6, JR-21, or JR-24. The distribution of contamination is interesting in that JR-5 is located upgradient of the Gasoline Tank Area in a groundwater regime with a northerly gradient (see Section 5.3). This coupled with the lack of observed contamination in downgradient samples JR-4 and JR-6 may indicate a zone within the vicinity of JR-5 that is confining the contamination within that immediate area.

5.3 Groundwater Elevation Data

Groundwater elevations were obtained from the survayed top-of-casing elevations and measured static water levels for each well. Table 3-2 summarizes the respective data. Figures 5-1 and 5-2 illustrate the

DRAFT

CORRECTIVE ACTION PLAN
JAMES RIVER CORPORATION
COATED PRODUCTS DIVISION

3400 North Marine Drive
Portland, Oregon 97217

SEACOR Job No. F0075-001-02

Submitted by
SEACOR

for
Mr. David Ernst
James River Corporation
North Portland Facility
3400 North Marine Drive
Portland, Oregon 97217

January 6, 1993

Science & Engineering Analysis Corporation
Post Office Box 1508
7614 SW Mohawk Street
Tualatin, Oregon 97062-1508
(503) 691-2030

Prepared by:

Mark A. Trewartha, RG
Associate Geologist

Reviewed by:

Russell D. Hamblin, RG
Senior Hydrogeologist

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1.0 INTRODUCTION

1.1 Scope of Work

This report presents a Corrective Action Plan (CAP) completed by Science & Engineering Analysis Corporation (SEACOR) for the Press Room and Gasoline UST areas at the James River Corporation (JRC) North Portland Facility in Portland, Oregon during previous investigations. The purpose of the CAP is to propose courses of action that would likely lead to regulatory closure for each of these two areas at the facility.

This report also summarizes the results of the second event, third year of quarterly groundwater monitoring and vapor extraction testing. In addition to recommending followup activities, the CAP summarizes the results of subsurface investigations conducted at the site. This CAP has been prepared to address the impacted subsurface soil and shallow groundwater that resulted from a release of gasoline in the vicinity of the former gasoline underground storage tank (UST) area and other volatile organic compounds in the vicinity of the former Press Room area USTs.

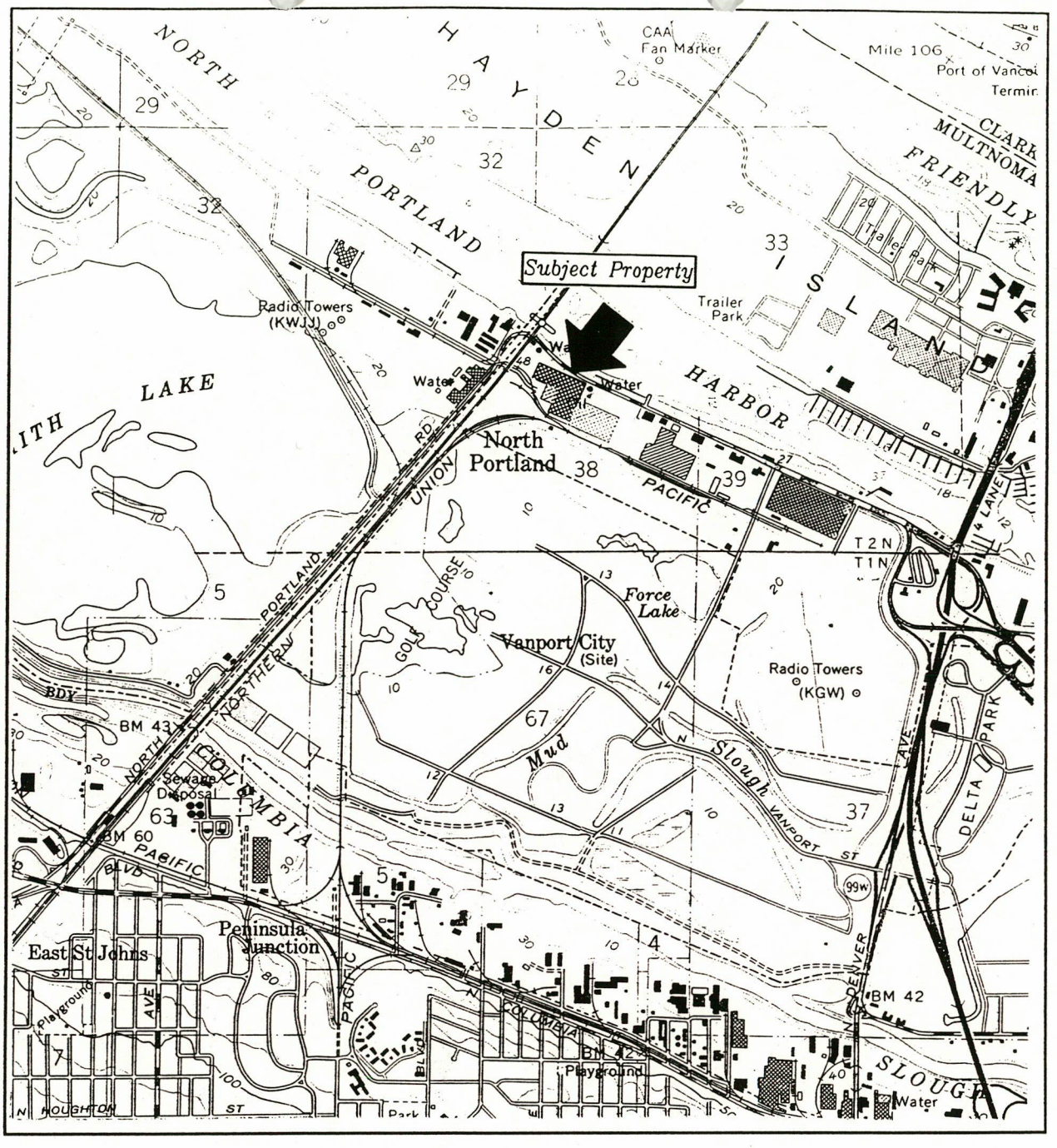
The current groundwater sampling event is part of an ongoing quarterly groundwater monitoring (QGWM) program that was initiated in February 1990 by Brown and Caldwell Consultants (BCC). The most recent QGWM event (second round, third year) was conducted on July 7, 1992 by SEACOR. The purpose of the QGWM program is to monitor the degree and extent of shallow groundwater contamination beneath the two areas of concern (the Press Room area and the Gasoline UST area) and compare analytical data as it relates to seasonal or other fluctuations in groundwater elevation, gradient, and direction of flow. The purpose of vapor extraction testing in the Press Room and Gasoline UST areas was to collect and analyze vapor samples and determine the possible presence of residual contamination in the vadose zones in each of these areas and to determine the feasibility of vapor extraction as a possible remedial alternative, should remediation be determined necessary.

The current QGWM event was completed by SEACOR on October 7, 1992. The QGWM activities were authorized under Purchase Order No. 92102157 and were performed in accordance with SEACOR's March 17, 1992 Revised Scope of Work. The vapor extraction test and CAP were authorized under Purchase Order No. 92103617 and were performed in accordance with SEACOR's October 15, 1992 Scope of Work.

1.2 Site Location and Description

The JRC is located at 3400 North Marine Drive in Portland, Multnomah County, Oregon. The JRC facility occupies an area of approximately 29 acres in a heavily industrialized section of North Portland. The JRC property is bounded to the north by North Marine Drive, which separates the site from the Columbia River and North Portland Harbor. To the south, an east-west trending railroad, owned by the Peninsula Terminal Company, separates the site from an undeveloped wetland and a golf course. The Portland Union Stockyard is located immediately east of the JRC facility, and a north-south trending mainline of the Burlington Northern Railroad runs along the western boundary of the site. The longitudinal and latitudinal coordinates for the site are 122° 41' 50.7" W and 45° 36' 38.7" N, respectively.

The main feature on site is the 530,000 square foot manufacturing complex, which houses Graphics Technology International (GTI), the Coated Products Division (CPD) of the JRC, and a large warehouse. A smaller, 30,000 square foot building complex occupies the northeast corner of the property and houses the CZ-Inks Division (CZD) of the JRC. Other prominent features on site include the GTI Solvent



REFERENCE: USGS 7.5X15 MINUTE QUADRANGLE, PORTLAND, OREGON (1977)

SCALE 1:24,000

1 0 1/2 0 1 MILE

1,000 0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 FEET

SEACOR	DRAWN BY: S. SPENCER
7614 S.W. Mohawk Street	APPROVED BY: [illegible]
Tualatin, OR 97062	DATE: 08/31/92
	JOB NO.: F0075-001-01

SITE LOCATION MAP

James River Corporation
North Portland Facility
3400 N. Marine Drive
Portland, Oregon
July 9, 1992

FIGURE 1

LOC-1.DWG

Recovery (SR) area, which occupies the northwest corner of the site; the GTI UST area; the GTI aboveground Solvent Laden Duct, which extends from the southeast corner of building No. 6 to the boiler house; and a paved, outdoor drum storage area located immediately east of the warehouse.

Approximately 56 percent (389,000 square feet) of the area surrounding the main building complexes consists of asphalt paved parking areas, driveways and storage areas. The remaining 44 percent (305,000 square feet) is unpaved and covered with grass, shrubs or gravel. A vacant grass field, approximately 177,500 square feet in area occupies the southwest corner of the site, and accounts for the majority of the unpaved site area. The entire JRC complex is secured by cyclone fencing with locking gates. Security guards are on duty during off hours.

1.3 Site Operations and History

The North Portland facility consists of GTI, formerly the Design Products Division of JRC, the CZD, and the CPD. GTI acquired the Design Products Division from JRC on April 29, 1991. The two JRC divisions and GTI combined employ approximately 650 full-time workers at the site.

GTI manufactures electrophotographic and electrographic coated papers for the copying machine industry. The CPD produces flexible packaging, including polyethylene films and papers, for the food and beverage market. The CZD prints labels and instructions on the paper and plastic products produced by CPD and GTI. The manufacturing of these products involves the use of a variety of volatile organic solvents, petroleum products, and ink.

Coated paper products have been produced at the JRC site since 1919, when the Western Waxed Paper Company (WWPC) was founded. In 1928, the WWPC merged with the Crown Willamette Paper Company and J.D. Zellerbach forming the Western Waxed Paper Company, Division of Crown Zellerbach. Several product diversifications and plant modifications have occurred since the 1928 merger including the production of gummed tape in the 1930s, the production of the first wax/polyethylene-blend paper in 1946, the installation of the first polyethylene extrusion coater, and the production of electrophotographic and electrographic coated paper in 1965. The JRC acquired the Crown Zellerbach facilities in May 1986.

In 1978, the North Portland facility emitted approximately 2,889 tons of waste volatile organic compounds. Since 1978, the facility has established several pollution control and hazardous material mitigation programs, which reduced the emission of waste volatile organic compounds to approximately 928 tons per year in 1988. These programs included the installation of a Solvent Vapor Recovery System in 1979; an ongoing solvent coatings reformulation program instituted in 1982; the installation of a Solvent Reclamation and Enclosed Ink Delivery Systems in 1984 and 1986; the replacement of PCB oil filled electrical equipment in 1986; asbestos removal in 1988-89; the decommissioning of USTs in 1988, 1989, and 1990; and replacement with an aboveground storage tank system.

1.4 Previous Environmental Investigations

To summarize previous investigative and remedial work conducted at the site, SEACOR reviewed documents supplied by JRC. According to a March 24, 1992 BCC letter report, five alcohol-solvent USTs were removed from the Press Room area and one gasoline UST was removed from the Gasoline UST area during April 1989. Chemicals stored in the CPD tanks included normal propanol/acetate, isopropyl alcohol/acetate ethanol/acetate, glycol ether, methanol, toluene, acetone, methyl isobutyl ketone (MIBK), and gasoline.

Laboratory analyses of soil samples collected during UST decommissioning indicated releases of methanol, ethanol, normal propanol, isopropyl alcohol, butanol, hexanol, acetone, toluene, MIBK, and ethyl acetate in the Press Room area. Butanol and hexanol, although not appearing on any chemical investory list provided by JRC, may have been used in minor quantities in the past in the Press Room UST area. In the Gasoline UST area, total petroleum hydrocarbons; and benzene, toluene, ethylbenzene, and xylenes (BTEX) chemicals were indicated. Upon completion of remedial excavation efforts, residual concentrations of these chemical compounds remained in soils in each of two areas.

During UST removals in the CPD, approximately 150 cubic yards of contaminated soil were excavated from the Press Room UST area and 70 cubic yards of contaminated soil were excavated from the Gasoline UST area. The contaminated soils from the two excavations were placed on plastic, in two separate 6 to 12-inch thick piles, and allowed to aerate from April to October 1989. Following successful completion of aeration activities and based on approval from the Oregon Department of Environmental Quality (DEQ) Northwest Region, the remediated soils were reused at the site as shallow backfill material in the vacant field east of the JRC warehouse.

To investigate the potential impact to shallow groundwater in both areas, three groundwater monitoring wells were installed in each of the two investigation areas. Wells JR-1, JR-2, and JR-3 were installed in the Press Room area, and wells JR-4, JR-5, and JR-6 were installed in the Gasoline UST area. The initial sampling and analyses indicated concentrations of isopropyl alcohol, acetone, and MIBK in monitoring well JR-2 in the Press Room area. Concentrations of benzene, ethylbenzene, and xylenes were detected in monitoring well JR-5 in the Gasoline UST area. None of the aforementioned analytes were detected at or above respective analytical method detection limits (MDLs) in monitoring wells JR-1, JR-3, JR-4, and JR-6 during the initial groundwater sampling event. Based on the results of the initial groundwater sampling event, an on-going quarterly groundwater monitoring program, which included the analysis of groundwater samples collected from each of the six monitoring wells on site, was initiated.

Since the initial groundwater sampling event, eight quarterly monitoring rounds have been completed. Previous QGWM events included the first year of monitoring consisting of February 1990, June 1990, September 1990, and January 1991 events; and the second year of monitoring consisting of April 1991, August 1991, November 1991, and February 1992 events. During each monitoring event, groundwater elevations were recorded to determine the approximate groundwater flow direction and gradient, and groundwater samples were collected and submitted for laboratory analyses. Summaries of the analytical results of groundwater samples collected from JR-2 and JR-5 during each of these events are included in tables within the following sections. Results of previous and current laboratory analysis of groundwater samples collected from groundwater monitoring wells JR-2 and JR-5 are presented in Tables 1 and 2, respectively. A summary of the previous eight QGWM events is included in the March 24, 1992 BCC report.

Constituents identified during the initial QGWM events including acetone, MIBK, isopropyl alcohol, and ethanol were not detected in JR-2 at or above laboratory MDLs. Variations in laboratory MDLs are the result of several factors including sample dilution due to relatively high concentrations of one or several analytes resulting in higher MDLs for other analytes; variations in analytical responses due to various purging rate efficiencies per compound, for the same test method, resulting in different MDLs between compounds; and use of different test methods from different laboratories for alcohol screening resulting in different MDLs. As indicated in Table 1, two consecutive quarterly monitoring events have been conducted where the results have indicated that acetone was not detected in well JR-2. In addition, MIBK, isopropyl alcohol, and ethanol were not detected during the last three, five, and six consecutive quarters, respectively.

Table 1. Groundwater Sample Analytical Results Summary
Press Room Area, Well JR-2

Monitoring Event	Date	Volatile / Purgeable Organics[a]			
		Acetone	MIBK[b]	Isopropyl Alcohol	Ethanol[c]
Initial Investigation	9/89	1,500[d]	440[d]	7,800[d]	<100[d]
(Duplicate)		(1,700)[d]	(430)[d]	(7,600)[d]	(<100)[d]
1st year, 1st quarter	2/90	8,000	900	14,400	<100
(Duplicate)		(6,200)	(920)	(14,100)	(<100)
1st year, 2nd quarter	6/90	620	130	5,100	22,000
(Duplicate)		(360)	(95)	(3,900)	(15,000)
1st year, 3rd quarter	9/90	6,200	1,400	69,000	23,000
(Duplicate)		(7,100)	(1,400)	(50,000)	(25,000)
1st year, 4th quarter)	1/91	1,500	150	2,900	<500
(Duplicate)		(2,900)	(260)	(5,600)	(<500)
2nd year, 1st quarter	4/91	1,900	220	<100	<100
(Duplicate)		(1,900)	(220)	(<100)	(<100)
2nd year, 2nd quarter	8/91	2,900	430	<1,000	<1,000
(Duplicate)		(4,200)	(520)	(<2,000)	(<2,000)
2nd year, 3rd quarter	11/91	14	<1.0	<50	<50
(Duplicate)		(<10)	(<1.0)	(<50)	(<50)
2nd year, 4th quarter	2/92	<10	<5.0	<100	<100
(Duplicate)		(<10)	(<5.0)	(<100)	(<100)
3rd year, 1st quarter	7/92	<25	<10	<1,000	<1
(Duplicate)		(<25)	(<10)	(<1,000)	(<1)

a By EPA Method 8240 and alcohol screen by GC/FID; concentrations reported in micrograms per liter (μg/L).
b MIBK referred to 4-Methyl-2-Pentanone in laboratory reports.
c Ethanol referred to Ethyl Alcohol in laboratory reports.
d By EPA Method 8310; concentrations reported in μg/L.

Concentrations of BTEX have been identified in JR-5 during the last 10 sampling events at various concentrations. The trend during the last 2 1/2 years has been a general decrease of BTEX concentrations. Analytical results of samples collected during October 1992 identified benzene, toluene, ethylbenzene, and total xylenes in well JR-5 at concentrations of 49 μg/L, 3 μg/L, 2 μg/L, and 12 μg/L, respectively. Ethylene dibromide (EDB), ethylene dichloride (EDC), and dissolved lead were not detected at or above respective laboratory MDLs. Variations in laboratory MDLs are most likely due to sample dilution in response to fluctuations in the concentrations of various analytes.

Table 2. Groundwater Sample Analytical Results Summary
Gasoline UST Area, Well JR-5

Monitoring Event	Date	Aromatic Volatile Organics[a]				EDB & EDC[b]	Lead
		Benzene	Toluene	Ethyl-Benzene	Total Xylenes		
Initial Investigation	9/89	120	<1[c]	14	960	--[d]	--
1st year, 1st quarter	2/90	120	11	<1	500	--	--
(Duplicate)		(140)	(14)	(<1)	(580)	--	--
1st year, 2nd quarter	6/90	89	5	<1	230	--	--
(Duplicate)		(76)	(5)	(<1)	(220)	--	--
1st year, 3rd quarter	9/90	160	19	95	400	--	--
(Duplicate)		(150)	(18)	(88)	(400)	--	--
1st year, 4th quarter	1/91	180	22	85	820	--	--
2nd year, 1st quarter	4/91	51	27	250	1,200	--	--
(Duplicate)		(57)	(27)	(250)	(1,200)	--	--
2nd year, 2nd quarter	8/91	94	12	290	700	--	--
(Duplicate)		(99)	(15)	(390)	(920)	--	--
2nd year, 3rd quarter	11/91	64	<5.0	<5.0	44	<2.0	14[e]
(Duplicate)		(70)	(<5.0)	(<5.0)	(57)	(<2.0)	(31)[e]
2nd year, 4th quarter	2/92	84	9.1	<5.0	130	<1.0	<100[f]
(Duplicate)		(83)	(7.2)	(<5.0)	(120)	(<1.0)	(<100)[f]
3rd year, 1st quarter	7/92	49	3	2	12	<0.5	<2[g]
DEQ GWCS[h]	10/92	5	1,000	700	10,000	1 , 5	5

a By EPA Method 8020; concentrations reported in micrograms per liter (μg/L).
b Ethylene dibromide and ethylene dichloride analyses by EPA Method 8010; concentrations reported in μg/L.
c "<" denotes analytical method detection limit (MDL).
d Denotes analysis not performed.
e Total lead analysis by EPA Method 3005, 7421; concentrations reported in μg/L. Because this analysis is performed on an unfiltered groundwater sample, it is likely that the elevated lead concentration indicated by this analysis is due to the dissolving of sediment containing lead during sample preservation with nitric acid.
f Organic lead analysis by the "organo-lead" method; concentrations reported in μg/L.
g Dissolved lead analysis by EPA Method 7421 on sample filtered in the field; concentrations reported in μg/L.
h DEQ Groundwater Cleanup Standards (GWCS), effective October 1, 1992; concentrations reported in μg/L. Shading indicates concentrations exceed GWCS.

2.0 HYDROGEOLOGY

Examination of published and unpublished geological and hydrogeological reports for the immediate area, combined with data collected from on-site investigations have provided an initial characterization of the geology and hydrogeology of the site.

2.1 Site Geomorphology and Regional Climate

The JRC facility is located at 3400 North Marine Drive in the NW1/4 of the SW1/4 of Section 33, Township 2N, Range 1E. The topography of the site area is generally flat. According to USGS topographic maps of Portland, there is only moderate elevation variation across the site. The average elevation of the site is approximately 10 to 20 feet above mean sea level (MSL).

The area in the vicinity of the site receives an average of approximately 42 inches of precipitation per year. In an average year, approximately 70 percent of precipitation occurs within a five month period from November through March.

2.2 Regional Geologic Setting

The JRC facility is situated in the Columbia River Flood plain south of the Columbia River and north of the Portland Terraces. The flood plain contains several marshes, shallow lakes, and sloughs, in many of which the water levels are kept low by artificial drainage. Most of the flood plain area is protected by artificial dikes and is flooded only partly during years of exceptionally heavy rainfall or of very high water in the Columbia River. Lithology of near surface deposits in the Columbia River Flood plain consist of younger alluvium of Recent age. The younger alluvium consists of gravel, sand, silt, and clay; slightly stratified. Thickness of the alluvium can be as much as approximately 200 feet along the Columbia River.

Underlying the alluvium is the Troutdale Formation. The Troutdale Formation consists mostly of well-indurated sandy conglomerate containing pebbles, cobbles, and scattered boulders. The Troutdale Formation in the area was mainly deposited by westward flowing streams, presumably parts of the ancestral Columbia River drainage system, which imparted to the deposits a slight initial westward dip.

2.3 Regional Hydrogeology

The main aquifers within the Columbia River flood plain are sand and gravel layers within the younger alluvium and in the underlying Troutdale Formation. The upper part is mostly fine-grained sand, silt, and clay, which generally do not yield large amounts of water to wells, but also includes some isolated lenses of sand and fine-grained gravel which yield moderate to large amounts of water. The lower parts of the alluvium contain more abundant and continuous layers of sand and gravel that are capable of yielding large quantities of water to wells (Hogenson and Foxworthy, 1965, Geological Survey Water-Supply Paper 1793).

Large amounts of groundwater discharge naturally from the Troutdale Formation through many seeps and springs. The springs that drain this formation have flows ranging from 1 gallon per minute to several hundred gallons per minute.

The water table beneath the flood plain is nearly horizontal and is at approximately the level of the Columbia River, except during high stages of the river.

2.4 Site Geologic Setting

Based on logs of borings drilled at the site during previous investigations, asphalt and approximately 1 foot of a shallow road base layer was initially encountered. Underlying the road base was typically a silty sand and gravel to a depth of approximately 5 feet below ground surface (bgs) which graded into a fine-grained, well sorted sand. Underlying the sand (approximately 12 to 15 feet bgs) to the total depth of the borings are clayey sand and sandy clay. The maximum depth drilled at the site was 20 feet in the borings converted to monitoring wells.

2.5 Site Hydrogeology

The top of casing elevations of the monitoring wells at the site were surveyed during the previous BCC investigations to provide elevation data. Combining the elevation data of the wells with static water level measurements in the wells, a groundwater gradient and inferred flow direction was determined. QGWM of groundwater monitoring wells at the site has been conducted since February 1990. Results of previous groundwater monitoring activities in the gasoline UST area has indicated groundwater gradients ranging from 0.70 to 3.60 with inferred flow directions ranging from west-northwest to northeast. Results of previous groundwater monitoring activities in the Press Room area have indicated groundwater gradients ranging from 0.01 to 2.50 with inferred flow directions ranging from west-northwest to north east. The calculated groundwater gradients and inferred flow direction from previous groundwater monitoring activities in the Press Room and Gasoline UST areas are shown on Tables 3 and 4, respectively.

Table 3. Groundwater Gradient Summary
Press Room Area

Monitoring Event		Date	Flow Direction	Gradient[a]	Elevation Change[b]
Initial Investigation		9/89	N 18° E	0.23	--[c]
1st Year	1st quarter	2/90	N 2° W	0.23	Increase
	2nd quarter	6/90	N 51° W	0.01	Increase
	3rd quarter	9/90	N 7° W	0.63	Decrease
	4th quarter	1/91	N 0° W	0.28	Decrease
2nd Year	1st quarter	4/91	N 7° W	0.24	Increase
	2nd quarter	8/91	N 82° W	2.50	Decrease
	3rd quarter	11/91	N 33° E	0.45	Decrease
	4th quarter	2/92	N 23° E	0.41	Increase
3rd Year	1st quarter	7/92	N 30° E	0.59	Decrease
	2nd quarter	10/92	N 30° E	0.33	Decrease

a Feet vertical per 100 feet horizontal.
b Average change in groundwater elevation of wells JR-1, JR-2, and JR-3 relative to previous monitoring event.
c Base measurement.

Table 4. Groundwater Gradient Summary
Gasoline UST Area

Monitoring Event		Date	Flow Direction	Gradient[a]	Elevation Change[b]
Initial Investigation		9/89	N 10° E	0.70	--[c]
1st Year	1st quarter	2/90	N 65° W	2.61	Increase
	2nd quarter	6/90	N 84° W	1.40	Decrease
	3rd quarter	9/90	N 5° W	0.81	Decrease
	4th quarter	1/91	N 73° W	2.29	Increase
2nd Year	1st quarter	4/91	N 79° W	3.60	Increase
	2nd quarter	8/91	N 87° W	2.88	Decrease
	3rd quarter	11/91	N 17° W	1.21	Decrease
	4th quarter	2/92	N 17° E	2.27	Increase
3rd Year	1st quarter	7/92	N 25° E	1.40	Decrease
	2nd quarter	10/92	N 30° E	1.73	Decrease

a Feet vertical per 100 feet horizontal.
b Average change in groundwater elevation of wells JR-4, JR-5, and JR-6 relative to previous monitoring event.
c Base measurement.

3.0 QUARTERLY GROUNDWATER MONITORING - CURRENT PHASE

The current groundwater sampling event is part of an ongoing QGWM program that was initiated in February 1990 by BCC. The most recent QGWM event (third year, second quarter groundwater monitoring event) was conducted on October 7, 1992 by SEACOR. No QGWM event was conducted during Spring 1992, which would have been the regularly scheduled first quarter of the third year of QGWM.

The purpose of the QGWM program is to monitor the degree and extent of shallow groundwater contamination beneath the two areas of concern (the Press Room area and the Gasoline UST area) as it relates to seasonal or other fluctuations in groundwater elevation, gradient, and direction of flow.

Based on the results of the initial eight previous monitoring events, a revised quarterly monitoring program was designed and was initiated by SEACOR with the third year, first QGWM event. The revised program included collecting groundwater samples for laboratory analyses from wells JR-2 and JR-5 during the first and third quarterly monitoring events and from all six wells (JR-1 through JR-6) during the second and fourth quarterly monitoring events. As with the original monitoring program, static water level (SWL) measurements will be recorded for each of the six monitoring wells during all quarterly monitoring events. In addition, three quality assurance/quality control (QA/QC) samples will be collected during each quarterly monitoring event.

3.1 Field Procedures

SEACOR conducted the second QGWM event of the third year of on-site monitoring on October 7, 1992. Static water levels (SWLs) measured from the tops of well casings of each well were recorded to the nearest 0.01 feet using an electric water-level indicator. Groundwater gradients and flow directions for each of the investigation areas are discussed separately below.

Prior to sampling of wells JR-1 through JR-6 for laboratory analyses, the SEACOR geologist used a dedicated, disposable polyethylene bailer to collect a sample of groundwater for subjective analysis for the presence of floating product or sheen. The field geologist observed no floating product or sheen in any of the groundwater monitoring wells.

The geologist then purged the wells of approximately three well casing volumes of groundwater using a clean 1.5 inch dedicated disposable bailer. Non-dedicated sampling equipment was decontaminated between sampling locations in a laboratory-grade soap solution, initial tap water rinse, and a final rinse using deionized water.

Following the purge period, and after the water levels in the wells recovered to at least 85% of static conditions, groundwater samples were collected from each well using the same 1.5-inch diameter dedicated, disposable polyethylene bailer. The water to be sampled was decanted into laboratory prepared sample containers using a low-volume discharge port to minimize volatilization during the sampling process. Each sample container was filled to capacity and immediately sealed with a Teflon-lined lid to minimize volatilization by limiting headspace. The samples were labelled and placed immediately into a cooler on ice for transport to the analytical laboratory at a maximum temperature of 4 degrees Celsius. The geologist initiated a chain-of-custody document in the field. The chain-of-custody record accompanied the samples to the project laboratory. A copy of the chain-of-custody record is included as Appendix A.

Groundwater samples 100792-1, 100792-2, 100792-3, 100792-4, 100792-5 and 100792-6 were collected from wells JR-1 through JR-6, respectively. In addition, three quality assurance/quality control (QA/QC) samples were prepared, including a duplicate sample of JR-5 (100792-7), a field blank (100792-8), and a trip blank sample (100792-9). The field blank sample was prepared in the field by the geologist using laboratory-supplied deionized water. The deionized water was poured through the dedicated disposable 1.5 inch bailer, prior to its use on JR-4, into three 40 milliliter sample vials. The trip blank sample was prepared by the analytical laboratory using deionized water placed into appropriate sampling containers. The trip blank was transported to and from the project site in the sample preservation cooler along with the samples collected at the site.

3.2 Analytical Program and Results

The analytical program for the revised quarterly monitoring program includes the analysis of samples collected from the Press Room area for volatile and purgeable organics by EPA Method 8240 plus alcohols. Samples collected from the Gasoline UST area were analyzed for aromatic volatile organics including benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8020, ethylene dibromide and ethylene dichloride (EDB/EDC) by EPA Method 8010 and dissolved lead by EPA Method 7421. The QA/QC samples were analyzed for BTEX.

Results of laboratory analysis of groundwater samples collected from wells JR-1 through JR-3 in the Press Room area identified the concentrations of compounds detected during previous QGWM events at or above reporting limits (MRLs). As indicated in Table 1, this represents three consecutive quarterly monitoring events in which acetone was not detected in well JR-2. In addition, MIBK, isopropyl alcohol, and ethanol were not detected during the last four, six, and seven consecutive quarters, respectively in JR-2.

Results of laboratory analysis of groundwater samples collected from wells JR-4 and JR-6 in the gasoline UST area did not detect the presence of BTEX, ethylene dibromide (EDB) or ethylene dichloride (EDC) above MDLs in the samples collected from JR-4 and JR-6. The analyses for dissolved lead indicated 32 ug/l in JR-6. Results of laboratory analysis of the groundwater sample collected from JR-5 identified concentrations of benzene and total xylenes in well JR-5 at concentrations of 17 μg/L, and 3 μg/L, respectively. EDB and EDC and dissolved lead, were not detected at or above respective analytical MRLs.

Results of laboratory analysis of the current quarterly monitoring event and the previous monitoring events are summarized in Tables 5 and 6. A copy of the laboratory analytical report is included in Appendix A.

3.3 Groundwater Gradient

SEACOR evaluated groundwater gradient and the direction of inferred groundwater flow from field measurements. Elevation differences between the wells were combined with measurements of the depths to static water (measured to the nearest 0.01-foot) in the respective wells to calculate the differences in water level. Interpretation of the local groundwater gradient was made from contouring water elevations obtained at the site. The calculations are used to prepare a groundwater surface map for the site area. Table 7 presents the groundwater elevation data in each of the monitoring wells. A comparison of groundwater gradients and gradient directions in each investigation during the monitoring events since September 1989 are presented in Table 3 and 4.

Table 5. Groundwater Sample Analytical Results Summary
Press Room Area
Sampling Date: October 7, 1992

Sample Identification	Well Number	Volatile / Purgeable Organics[a]			
		Acetone	MIBK[b]	Isopropyl Alcohol	Ethanol
100792-1	JR-1	<10[c]	<5.0[c]	<1.0[c]	<1.0[c]
100792-2	JR-2	<10	<5.0	<1.0	<1.0
100792-3	JR-3	<10	<5.0	<1.0	<1.0

a By EPA Method 8240 and alcohol screen by GC/FID; concentrations reported in micrograms per liter (μg/L).
b MIBK reported as 4-Methyl-2-Pentanone in laboratory reports.
c Denotes less than method detection limits (MDL).

Table 6. Groundwater Sample Analytical Results Summary
Gasoline UST Area
Sampling Date: October 7, 1992

Sample Identification	Well Number	Aromatic Volatile Organics[a]				EDB & EDC[b]	Dissolved Lead[e]
		Benzene	Toluene	Ethyl-Benzene	Total Xylenes		
100792-4	JR-4	<0.5	<0.5[c]	<0.5	<0.5	<1.0/ <0.5	<5.0
100792-5	JR-5	17	<0.5	<0.5	3.0	<1.0/ <0.5	<5.0
100792-6	JR-6	<0.5	<0.5	<0.5	<0.5	<1.0/ <0.5	32
100792-7 (Duplicate)	JR-5	50	2.0	1.0	6.0	--[d]	--
100792-8 (Field Blank)	--	<0.5	<0.5	<0.5	2.0	--	--
100792-9 (Trip Blank)	--	<0.5	<0.5	<0.5	<0.5	--	--
DEQ GWCS[f]	--	5	1,000	700	10,000	1 , 5	0.005

a By EPA Method 8020; concentrations reported in micrograms per liter (μg/L).
b Ethylene dibromide and ethylene dichloride analyses by EPA Method 8010; concentrations reported in μg/L.
c "<" denotes analytical method detection limit (MDL).
d Denotes analysis not performed.
e Dissolved lead analysis by EPA Method 7421 on sample filtered in the field; concentrations reported in μg/L.
f DEQ Groundwater Cleanup Standards (GWCS), effective October 1, 1992; concentrations reported in μg/L.

Shading indicates concentrations exceed GWCS.

Table 7. Groundwater Elevation Data
Monitoring Date: October 7, 1992

Well No.	TOC[a] Elevation[b] (feet above USGS datum)	Static Water Level (feet below TOC)	Groundwater[b] Elevation (feet)
JR-1	27.17	16.54	10.63
JR-2	27.22	16.20	11.02
JR-3	24.92	13.86	11.06
JR-4	26.74	13.60	13.14
JR-5	26.91	12.04	14.87
JR-6	26.81	13.60	13.21

a Top of casing.
b United States Geological Survey datum, above mean sea level.

Based on the measured SWLs, SEACOR calculated an average shallow groundwater gradient in the Press Room area (wells JR-1 through JR-3) of approximately 0.0033, or approximately 0.33 feet vertical per 100 feet horizontal, with an inferred flow direction to the north-northeast. SWLs and inferred groundwater elevation contours are depicted on Figure 2.

Based on SWLs for the Gasoline UST area (wells JR-4 through JR-6), the groundwater gradient was calculated to be approximately 0.0173, or approximately 1.73 feet vertical per 100 feet horizontal, with an inferred flow direction to the north-northeast. SWLs and inferred groundwater elevation contours are depicted on Figure 3.

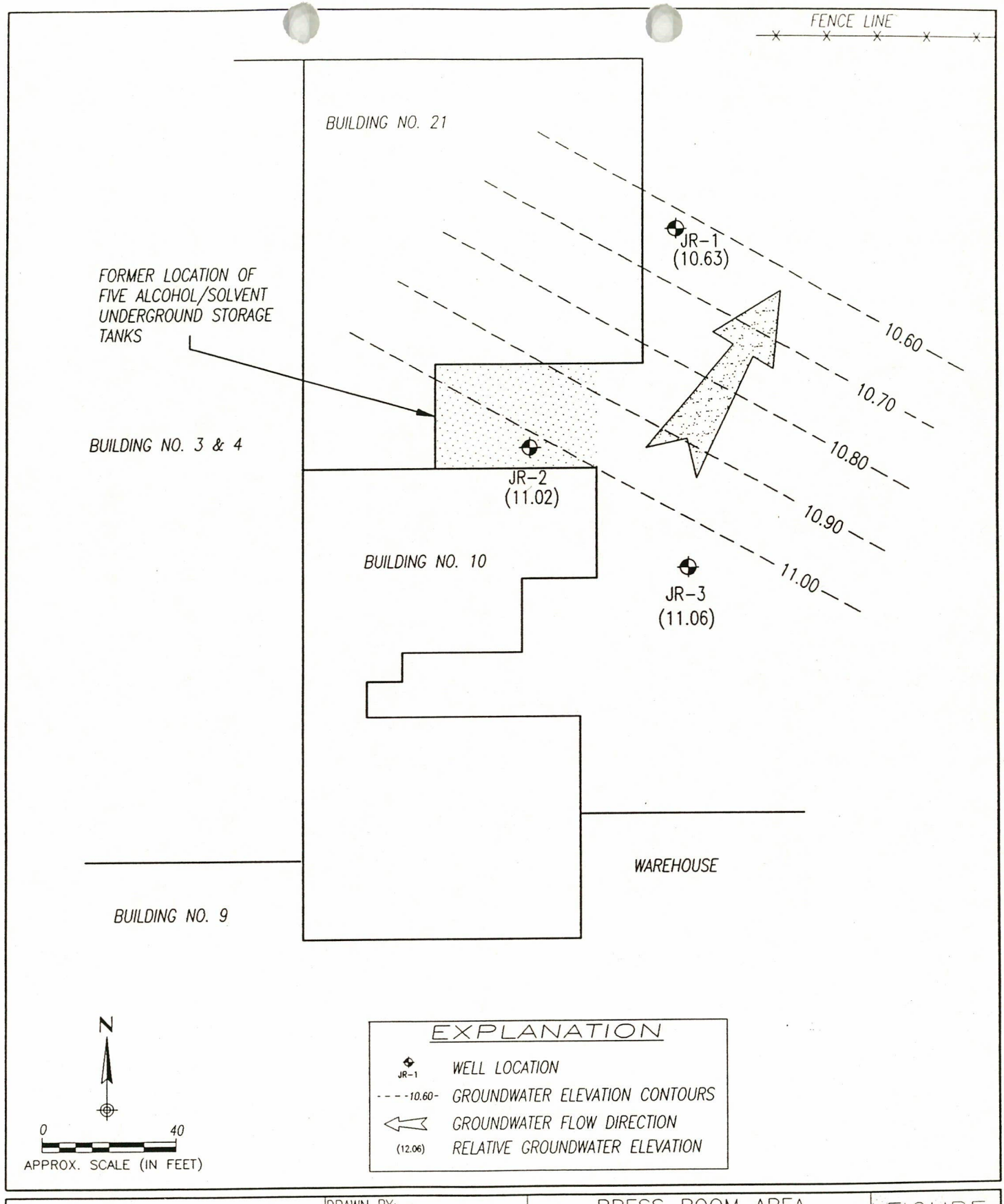
3.4 QGWM Conclusions

Based on observations and analytical results of the current quarterly monitoring event and a review of previous quarterly monitoring results, concentrations of contaminants previously detected in the Press Room area well JR-2 (including acetone, MIBK, isopropyl alcohol, and ethanol) have substantially decreased from those observed during previous sampling events.

The benzene concentrations of 17 μg/L, detected in JR-5, and 50 mg/L detected in the JR-5 duplicate sample, exceeded the DEQ Groundwater Cleanup Standard (GWCS) of 5 μg/L. The total xylenes concentration of 3 μg/L detected in JR-5 was well below the current DEQ GWCS for total xylenes of 10,000 μg/L. No other detectable concentrations of BTEX were detected in the gasoline UST area.

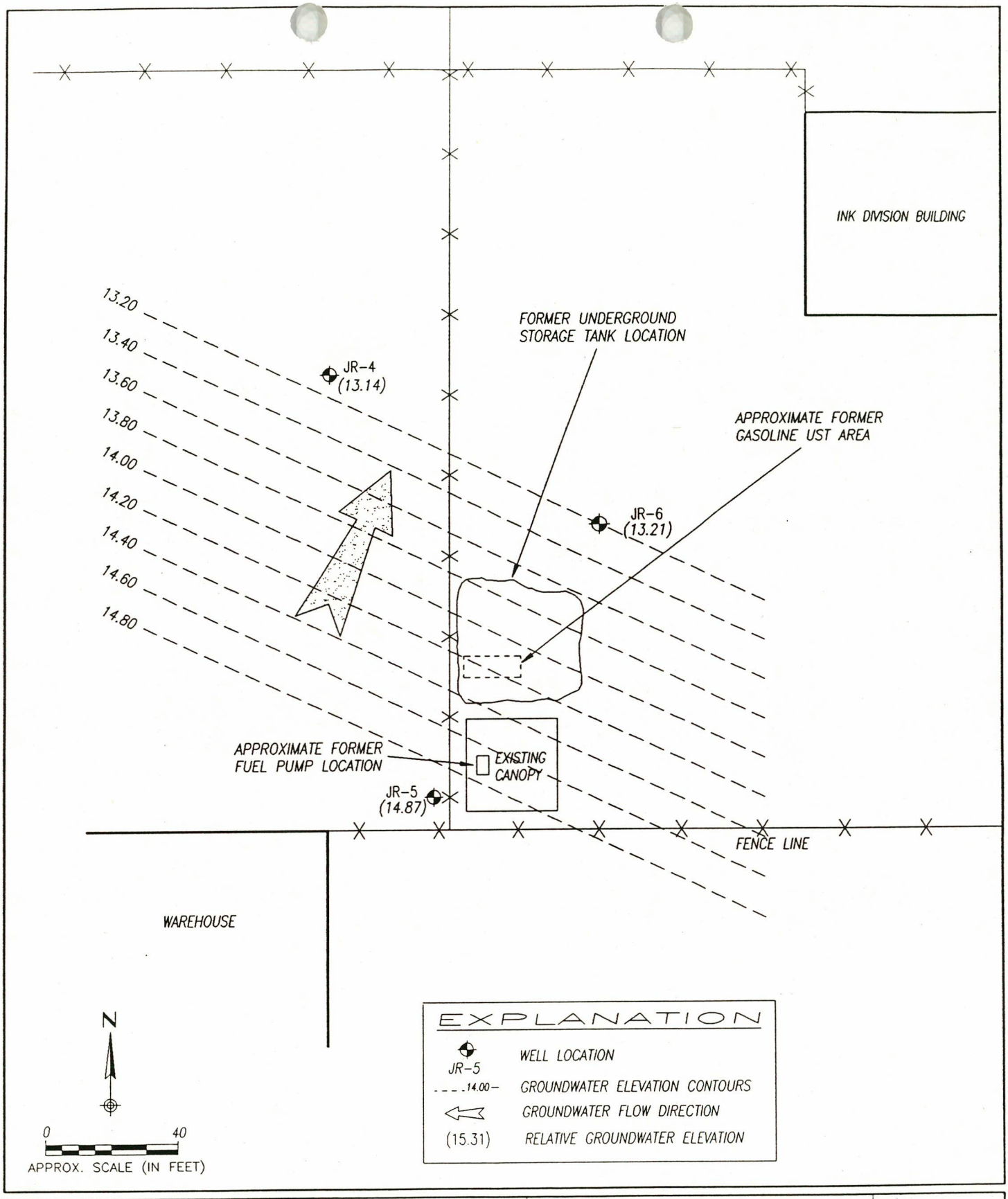
The dissolved lead concentrations of 32 μg/L, detected in JR-6, exceeded the GWCS of 5 μg/L. Since no hydrocarbon concentrations have been detected in JR-6 during any of the previous sampling events, this lead concentration is most likely unrelated to gasoline impact to shallow groundwater in the vicinity of JR-6. SEACOR recommends that a sample be collected from JR-6 during the next scheduled sampling event and analyzed for dissolved lead to determine if this concentration represents actual shallow groundwater conditions.

The continuous decreases of BTEX concentrations in JR-5 and consistency of volatile organic compounds below respective MRLs correspond well with recent decreases in water levels. A rise in water levels will likely be observed during the third quarterly monitoring event. Chemical concentrations of samples collected during the next monitoring event will be compared with water level changes.



SEACOR 7614 S.W. Mohawk Street Tualatin, OR 97062	DRAWN BY: S. SPENCER APPROVED BY: CDN DATE: 12/15/92 JOB NO.: F0075-001-01	PRESS ROOM AREA GROUNDWATER ELEVATION MAP Third Year Second Quarter James River Corporation North Portland Facility 3400 N. Marine Drive Portland, Oregon JULY 9, 1992	FIGURE 2

07501102.DWG



SEACOR

7614 S.W. Mohawk Street
Tualatin, OR 97062

DRAWN BY: S. SPENCER
APPROVED BY:
DATE: 12/15/92
JOB NO.: F0075-001-01

GASOLINE UST AREA
GROUNDWATER ELEVATION MAP
Third Year Second Quarter
James River Corporation
North Portland Faility
3400 N. Marine Drive
Portland, Oregon
October 7, 1992

FIGURE
3

07501103.DWG

4.0 REMEDIAL INVESTIGATION

The remedial investigation portion of this CAP included the completion of a vapor extraction test (VET) at the facility. The purpose of the VET was to determine the possible existence of hydrocarbon and other volatile organic compounds present in residual amounts in vadose zone soils in the Gasoline and Press Room UST areas. A secondary purpose for conducting the VET was to determine the feasibility of implementing a vapor extraction system (VES) for effective remediation of impacted soil and to determine the radius of influence of VES, should remediation be required in the future.

4.1 Vapor Extraction Test

4.1.1 Introduction

On November 18 and 19, 1991, SEACOR performed VETs on existing groundwater monitoring wells in the Press Room and Gasoline UST areas at the subject facility. The objectives of the VETs were: (1) determine the relationship between extracted soil vapor volumetric flow rate and the induced vacuum, (2) determine the area of influence that a tested well has on the surrounding subsurface, and (3) determine concentrations of volatile organic compounds in the extracted soil vapor. The tests were conducted for approximately four hours each at the Gasoline and Press Room UST areas. During the VET, a vacuum was monitored and vapor samples were collected and submitted for laboratory analysis.

4.1.2 Vapor Extraction Test Setup

The soil vapor extraction tests were conducted on a centrally located, groundwater monitoring well in the Press Room UST area (JR-2) and in the Gasoline UST area (JR-5). The suction line of a DR 404 Regenerative, 1 horsepower Rotron blower was connected to the 4-inch inside diameter wellhead. A vacuum gauge was attached to the suction line of the blower and portable gauges were used for monitoring vacuum in surrounding on-site monitoring wells. The discharge line of the blower was allowed to exhaust vapors into the atmosphere and was monitored for hydrocarbon concentrations using a portable photoionization detector (PID). Vapor samples for laboratory analysis were collected using *Teldar* bags. Vapor was collected from the blower discharge line vapor stream. The vapor extraction test data forms are included as Appendix B.

4.1.3 Volumetric Flow Determination

The relationship between soil vapor volumetric flow rate and vacuum was established by using performance specifications of the Rotron blower, provided by the manufacturer. The blower induced a vacuum of 40 to 50 inches of H_2O on wells JR-5 and JR-2, respectively, at the start of the test. Vacuum readings remained constant throughout the tests.

4.1.4 Area of Influence

The area of influence was determined by monitoring the vacuum induced on the surrounding on-site monitoring wells. Vacuum at each monitoring well was measured using portable magnehelic gauges attached to a 4-inch PVC slip cap. The cap and gauge were fastened to each wellhead and the resulting vacuum was recorded after a 5-minute stabilization interval. Wellhead vacuum readings appeared to stabilize at approximately one and one-half hours into the PVET. The data indicating the area of influence from withdrawing soil vapor from monitoring wells JR-2 and JR-5 are presented in Table 8 and 9. These data represent the vacuum measurements recorded after three hours of pumping.

Table 8. Influence on Adjacent Wells During
Vapor Extraction Test - Press Room Area

Vapor Well Identification	Distance from Well JR-2 (feet)	Vacuum[a] (inches of H_2O)
JR-1	80	0.0
JR-3	60	0.02 - 0.07

a Vacuum influence of 50 inches of H_2O vacuum on well JR-2.

Table 9. Influence on Adjacent Wells During
Vapor Extraction Test - Gasoline UST Area

Vapor Well Identification	Distance from Well JR-5 (feet)	Vacuum[a] (inches of H_2O)
JR-4	131	0.0 - 0.02
JR-6	96	0.02 - 0.04

a Vacuum influence of 40 inches of H_2O vacuum on well JR-2.

4.1.5 Soil Vapor Analytical Results

Two soil vapor samples and two sample duplicates were collected from the blower exhaust stream during each VET. Samples were collected at the approximate midpoint and at the end of each test. The samples collected from JR-2 in the Press Room area were analyzed for volatile and purgeable organics by EPA Method TO-14 GC/MS Full Scan. Samples collected from JR-5 in the Gasoline UST area, including one duplicate sample, were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) and for total petroleum hydrocarbons as gasoline (TPH-GAS) by PID/FID(A). All vapor samples were analyzed by NET Laboratory in Tualatin, Oregon. Samples were collected, handled (under chain-of-custody procedures), and managed using DEQ-approved methodologies. Tables 10 and 11 present the analytical results of these samples. Laboratory analytical reports and chain-of-custody document of soil vapor samples are presented in Appendix C.

4.1.6 Vapor Extraction Test Evaluation

Based on the results of the tests, a minimum radius of influence of approximately 96 feet was observed in the vicinity of JR-5 in the Gasoline UST Area and a minimum radius of influence of approximately 60 feet was observed in the vicinity of JR-2 in the Press Room Area.

Based on performance evaluation data available from Rotron, the volumetric flow rate experienced during the VETs was 45 standard cubic feet per minute (SCFM) in the Press Room UST area and 60 SCFM in the Gasoline UST area. Increasing the flow rate may also increase the radius of influence. Vacuum measured in the adjacent wells indicate a relatively small influence during the course of the VETs.

Based on the analytical results of the vapor samples collected during the VETs, TPH as gasoline and BTEX compounds are present at moderate concentrations in the vadose zone in the Gasoline UST area in the vicinity of JR-5. Also, several volatile organic compounds are present at relatively low concentrations in the vadose zone in the Press Room area in the vicinity of JR-2. The chemical constituents identified most likely represent residual gasoline contamination remaining in the vadose zone in the vicinity of JR-5 following initial remedial excavation activities in the Gasoline UST area. The presence of acetone, toluene, methanol, and iso-propanol in the vicinity of JR-2 indicates a possible source of contamination remaining in the vadose zone in the Press Room UST area. The source of 13 other volatile organic compounds identified in the vicinity of JR-2 is unknown and may not be associated with the former USTs in the Press Room area. As water levels rise to levels where these chemicals exist, additional impact to shallow groundwater with respect to some of these constituents is possible.

Table 10. Vapor Sample Analytical Results
Press Room Area

Compounds[b]	Sample Identification[a]	
	JR-2-1 (13:05/130)	JR-2-2 (15:15/260)
Vinyl Chloride	270	380
Chloroethane	340	360
Acetone	20	28
Benzene	7.2	20
Methylene Chloride	14	14
1,1-Dichloroethene	<2.0	3.9
1,1-Dichloroethene	120	130
cis-1,2-Dichloroethene	35	45
1,1,1-Trichloroethane	71	95
Trichloroethene	14	18
Tetrachloroethene	170	230
Toluene	23	49
Ethylbenzene	15	18
Total Xylenes	67	80
Styrene	7.1	7.7
Methanol	190	160
Iso-Propanol	8.8	7.7

a Collected from Well JR-2.

b By EPA Method TO-14 GC/MS Full Scan; method reporting limits (MRLs) range from 2.0 parts per billion by volume (ppbv) to 4.0 ppbv.

c Sample collection time followed by time elapsed (in minutes) since beginning test.

Table 11. Vapor Sample Analytical Results
Gasoline UST Area

Sample[a] Identification	Collection Time (Test start time: 0910)	Elapsed Time (minutes)	TPH-Gas[b] (ppmv)	Aromatic Volatile Organic Results[c] (ppmv)			
				Benzene	Toluene	Ethylbenzene	Xylenes
JR-5-1	1110	120	200	0.5	2	0.8	8
(Duplicate)			(200)	(0.5)	(2)	(0.9)	(8)
JR-5-2	1330	260	170	0.4	2	(0.8)	8

a Collected from Well JR-5.
b TPG-Gas by GC-FID, reporting limit 15 parts per millions by volume (ppmv).
c BTEX by GC/PID, reporting limit 1.5 ppmv.

5.0 ENVIRONMENTAL RISK AND EXPOSURE ASSESSMENT

Environmental Risk and Exposure Assessments are used to quantify the risk to human health and the environment. Such analyses are generally applicable to large releases with substantial environmental impact. The release at the James River site involves few potential receptors and potential exposure pathways with low risk to human health. The discussion here will, therefore, be a limited qualitative analysis.

5.1 Nature of Contamination

The primary impacting source at the site has been reported as primarily gasoline, BTEX, acetone, MIBK, isopropyl alcohol, and ethanol. Gasoline is a mixture of over 200 petroleum-derived chemicals and several synthetic products added to improve fuel performance. Gasoline component analysis is typically limited to detecting volatile aromatic compounds including BTEX. These volatile aromatic compounds are reported to pose the most serious known threat to human health of the gasoline constituents, are present in relatively high concentrations in gasoline, and have the greatest potential to migrate through the soil and impact groundwater quality. Basic chemical characteristics for BTEX are listed in Table 12.

Table 12. Basic Properties of BTEX[a]

Compound	Chemical Formula	Solubility (ppm)	Mobility[b] Class	Weight Percent in Gasoline	Toxic Effects
Benzene	C_6H_6	1,730	high	0.12-3.50	carcinogenic
Toluene	C_7H_8	500	moderate	2.73-21.80	neurotoxic
Ethylbenzene	C_8H_{10}	150	low	0.36-2.86	neurotoxic
Xylene (ortho)	C_8H_{10}	170	moderate	0.68-2.86	neurotoxic
Xylene (meta)	C_8H_{10}	146	low	1.77-3.87	neurotoxic
Xylene (para)	C_8H_{10}	156	low	0.77-1.58	neurotoxic

a California Leaking Underground Fuel Tank Manual, December 1987.

b Mobility of Organic Solvents in Winter-Saturated Soil Materials; Environmental Geology and Water Sciences, 7 (1985): 241-47.

The chemical components contained in gasoline exhibit a specific gravity less than that of water and therefore, in the non-aqueous phase, will exist in a positively buoyant state (float) on top of the phreatic surface of the water table. As a result, dispersion of gasoline components occurs primarily as a hydraulically downgradient plume and secondarily as a slight hydraulically upgradient plume along the surface of the water table. Fractionation of the various components also occurs as they move from the source. Individual component partition coefficients, soil permeability, and soil type determine the extent of fractionation. In addition, some of the more soluble gasoline components, such as benzene, dissolve into the water and become mobile.

A computer simulation program developed for the EPA evaluated physical characteristics of gasoline components. The program, called "The Seasonal Soil Compartment Model" (SESOIL), indicated that lighter hydrocarbons associated with gasoline are more likely to volatilize while heavier constituents bind tightly to soil particles, especially if the soil contains a high percentage of clay minerals. The results of one use study are summarized in Table 13.

Table 13. Relative Environmental Partitioning of Petroleum Constituents based on SESOIL Results (%)

Petroleum Compound	Adsorption Soil Particles	Volatilization	Soluble Portion in Groundwater and Soil Moisture
Benzene	3	62	35
Toluene	3	77	20
Ethylbenzene	21	59	20
Xylene (ortho)	15	54	31

5.2 Regulatory Requirements

Regulatory compliance issues and reports of environmental investigations at the Press Room UST and Gasoline UST areas have recently been reviewed and evaluated by the DEQ Northwest Region-DEQ's Environmental Cleanup Division (ECD). Although currently not involved with these JRC sites, ECD may at some future time be involved with site closure issues in cooperation with the Northwest Region of DEQ. Any future involvement by ECD will most likely be made known to JRC in writing.

The DEQ has established a matrix (Table 14) for evaluation of soil cleanup requirements applicable to petroleum releases from USTs when the release is of small magnitude and when groundwater is not impacted. Although not directly applicable to this site, the site evaluation procedures outlined in the matrix cleanup guidelines are useful to characterize a site and the potential impact of a release. The matrix takes into consideration five parameters: (1) depth to groundwater, (2) mean annual precipitation, (3) native soil type, (4) sensitivity of the uppermost aquifer, and (5) potential receptors. This evaluation was completed in accordance with Oregon Administrative Rules (OAR) 340-112-301 to 340-122-360.

The matrix score indicates that Level 2 Cleanup Standards (80 mg/Kg gasoline boiling-range hydrocarbons, and 500 mg/Kg diesel boiling-range hydrocarbons) would apply to the James River site as outlined in OAR 340-122-335(2). As stated in OAR 340-122-335, at locations where soil is impacted with gasoline and non-gasoline fraction hydrocarbons, the gasoline cleanup standard applies to gasoline contamination and the diesel cleanup standard applies to non-gasoline contamination such as diesel.

By definition, the matrix cleanup guidelines are not applicable to the cleanup of petroleum releases of large magnitude or complexity, or involving impact to groundwater. However, matrix cleanup standards are sometimes used as guidelines to establish cleanup targets for vadose zone soils. Once DEQ's Groundwater Cleanup Standards (GWCSs) are met with respect to petroleum hydrocarbons, the DEQ may require cleanup of soils if residual hydrocarbon concentrations exceed Level 2 cleanup standards in the Gasoline UST area. If residual volatile organic compounds are identified in soils in the Press Room UST area, the DEQ may require compliance with respect to DEQ's Numerical Soil Cleanup Levels for simple "sites" as established in DEQ's October 1, 1992 Environmental Cleanup Rules.

GWCSs have been adopted by DEQ since October 1, 1992. When gasoline contaminants are identified in groundwater, GWCSs apply for aromatic volatile organics including benzene, toluene, ethylbenzene, and total xylenes; ethylene dibromide (EDB); ethylene dichloride (EDC); and total lead. The GWCSs for benzene, toluene, ethylbenzene, and total xylenes are 5 micrograms per liter (μg/L), 2,000 μg/L, 700 μg/L, and 10,000 μg/L, respectively. The GWCSs for EDB, EDC, and total lead are 1 μg/L, 5 μg/L, and 5 μg/L, respectively.

Table 14. Matrix Evaluation of Soil Cleanup Requirements
Oregon Administrative Rules (OAR) 340-112-301 to 340-122-360

EVALUATION PARAMETERS	
1	Depth to groundwater: Based on information gathered during monitoring well installation, the shortest vertical distance to groundwater during the rainy season is less than 25 feet.
	MATRIX SCORE: 10
2	Mean annual precipitation: The mean annual precipitation in the Northwest Portland area is approximately 42 inches per year.
	MATRIX SCORE: 5
3	Native soil type: The native soil beneath the site is predominantly silty sand and fine-grained, well sorted sands.
	MATRIX SCORE: 5
4	Sensitivity of uppermost aquifer: The uppermost aquifer is considered potable but is not currently used for drinking water. Water service to the area is provided by the City of Portland.
	MATRIX SCORE: 4
5	Potential receptors: (a) The distance to the nearest water well is greater than 1/2 mile (MEDIUM). (b) The number of people at risk within two miles is conservatively estimated to be MANY (>3,000).
	MATRIX SCORE: 10
The sum of the above matrix scoring gives a maximum **TOTAL MATRIX SCORE of 34.**	

5.3 Current and Future Exposure Routes

Risk to the general public due to low levels of compounds detected in groundwater is small. Drinking water is supplied to the area by the city water system. Also, there are no drinking water wells located downgradient from the James River site. Based on the existence of the city water supply system, it is unlikely that future potable water wells would be drilled in this area.

Risk of public exposure to soils containing residue levels of the compounds is also small. The site is effectively capped with the asphalt and concrete surfacing. This will prevent exposure from these chemicals by direct contact, inhalation, or ingestion.

5.4 Characterization of Toxic Effects

5.4.1 Gasoline Constituents

Benzene Benzene is a colorless, aromatic liquid. Benzene may create an explosion hazard. Benzene is incompatible with strong oxidizers, chlorine, and bromine with iron. Benzene is irritating to the eyes, nose, and respiratory system. Prolonged exposure may result in giddiness, headache, nausea, staggering gait, fatigue, bone marrow depression, or abdominal pain. Routes of entry include inhalation, absorption, ingestion, and skin or eye contact. The target organs are blood, the central nervous system (CNS), skin, bone marrow, eyes, and respiratory system. Benzene is carcinogenic.

Toluene Toluene is a colorless, aromatic liquid. Toluene may create an explosion hazard. Toluene is incompatible with strong oxidizers. Prolonged exposure may result in fatigue, confusion, euphoria, dizziness, headache, dilation of pupils, lacrimation, insomnia, dermatitis, or photophobia. Routes of entry are inhalation, absorption, ingestion, and skin or eye contact. The target organs are the CNS, liver, kidneys, and skin.

Ethylbenzene Ethylbenzene is a colorless, aromatic liquid. Ethylbenzene may create an explosion hazard. Ethylbenzene is incompatible with strong oxidizers. Ethylbenzene is irritating to the eyes and mucous membranes. Prolonged exposure may result in headache, dermatitis, narcosis, or coma. Routes of entry include inhalation, ingestion, and skin or eye contact. The target organs are the eyes, upper respiratory system, skin, and the CNS.

Xylene Isomers Xylene is a colorless, aromatic liquid. Xylene may create an explosion hazard. Xylene is incompatible with strong oxidizers. Xylene is irritating to the eyes, nose, and throat. Prolonged exposure may result in dizziness, excitement, drowsiness, staggering gait, corneal vacuolization, vomiting, abdominal pain, or dermatitis. Routes of entry are inhalation, absorption, ingestion, and skin or eye contact. The target organs are the CNS, eyes, gastrointestinal tract, blood, liver, kidneys, and skin.

5.4.2 Volatile Organics

Acetone Acetone is a colorless liquid with a fragrant, mint-like odor. Acetone may create an explosion hazard. Acetone is incompatible with oxidizers and acids. Acetone is irritating to the eyes, nose, and throat. Prolonged exposure may result in dizziness or dermatitis. Routes of entry are inhalation, ingestion, and skin or eye contact. The target organs are the respitory system and skin.

4-Methyl-2-Pentanone (methyl isobutyl ketone) 4-Methyl-2-Pentanone is a colorless liquid with a pleasant odor. 4-Methyl-2-Pentanone may create an explosion hazard. 4-Methyl-2-Pentanone is incompatible with strong oxidizers. 4-Methyl-2-Pentanone is irritating to the eyes, mucus membrane. Prolonged exposure may result in narcosis, coma, or dermatitis. Routes of entry are inhalation, ingestion, and skin or eye contact. The target organs are the respitory system, eyes, skin, and CNS.

Isopropyl Alcohol Isopropyl Alcohol is a colorless liquid with an odor of rubbing alcohol. Isopropyl Alcohol may create an explosion hazard. Isopropyl Alcohol is incompatible with strong oxidizers. Isopropyl Alcohol is mildly irritating to the eyes, nose, and throat. Prolonged exposure may result in drowsiness, dizziness, dry cracking skin, gastrointestinal cramps, nausea,

or diarrhea. Routes of entry are inhalation, ingestion, and skin or eye contact. The target organs are the respitory system, eyes, and skin.

Ethanol Ethanol is a colorless, volatile liquid with a vinous odor. Ethanol may create an explosion hazard. Ethanol is mildly irritating to the eyes, nose, and throat. Prolonged exposure may result in dizziness, headache, or nausea. Routes of entry are inhalation, ingestion, and skin or eye contact. The target organs are the respitory system, eyes, and skin.

5.5 Potential for Future Releases

The potential for future releases is relatively low. The sources of the previous releases of gasoline and other volatile organic compounds, which were the former USTs in each area, have been removed by decommissioning. In addition, the former UST areas were backfilled and the UST system of the Press Room area was replaced with an aboveground tank farm with spill containment structures and associated overhead piping. James River did not replace the gasoline UST system and currently does not store motor fuel at the site.

5.6 Fate and Migration of Residual Contamination

As is discussed previously, groundwater and vadose zone contamination is present beneath the site adjacent to building No. 10 and No. 21 in the Press Room UST area, and in the Gasoline UST area near the northeast corner of the warehouse. Several mechanisms will primarily affect the fate of the residual contamination. These include leaching due to infiltration of moisture, adsorption/desorption from soil, advection of dissolved constituents, and biodegradation. Direct migration of free product hydrocarbons may have been a significant contributing mechanism when the release was fresh; however, free product is not believed to be present at the site.

Leaching of contaminants due to infiltration of moisture is expected to have minimal impact on the fate or migration of contaminants since the site and surrounding streets and sidewalks effectively cap the area.

Adsorption/desorption of hydrocarbons from soil and plume migration due to advection are closely linked in the Gasoline UST area at the James River site. Due to the relatively long length of time since the release, residual petroleum hydrocarbons are likely primarily adsorbed in soil. While no assessment was made of factors influencing in situ ion exchange capacity, the relatively low levels of petroleum hydrocarbons detected in groundwater, combined with the limited extent of plume migration, suggests that residual contaminants are largely adsorbed. If this is the case, contaminant advection will occur only to the extent that desorption occurs. Most of the contaminants of concern in the Press Room UST area have relatively high solubility rates and are generally high in mobility once mixed with water.

Anaerobic degradation of the remaining petroleum hydrocarbons and other volatile organic compounds in soils and shallow groundwater at the site is expected to be the single largest mechanism affecting their fate. This mechanism is recognized as being relatively slow. Therefore, degradation may continue for a number of years.

6.0 REMEDIAL OPTIONS AND RECOMMENDATIONS

6.1 Summary of Remedial Options

Due to the apparent age and magnitude of the product releases at the James River facility, the potential for migration of contaminants from soil to shallow groundwater appears to be relatively high, particularly when high water-levels occur. The primary risk at the site is related to migration of contaminants in groundwater. However, no evidence has been observed to indicate that the chemical compounds that have been identified at the site have migrated to the down gradient wells in either the Press Room or Gasoline UST areas, based on monitoring data collected during the past three years.

It is generally accepted that the primary active cleanup method for dissolved hydrocarbons in groundwater is to pump from wells or recovery trenches and treat the removed groundwater until acceptable concentrations are obtained at selected monitoring wells. Acceptable levels of BTEX and TPH compounds in the groundwater are mainly based on the potential for exposure, as determined from a contaminant mobility and exposure assessment, and the potential for attenuation through processes of natural biodegradation, volatilization, adsorption, dispersion, and non-specific oxidation. In addition, vapor extraction of the contaminated soil as an on-going source of groundwater contamination is generally attempted.

Six remedial options are discussed for the James River facility including: (1) excavation of the remainder of contaminated soils; (2) vapor extraction of hydrocarbon-enriched vapors from the contaminated vadose zone soil; (3) groundwater pumping and treatment system via air stripping; (4) air sparging; (5) in situ bioremediation of soil and groundwater; and (6) passive remediation via natural dissipation and degradation mechanisms.

6.2 Removal of Soil by Excavation

Field and analytical observations from the previous investigations and from the VETs during the current investigation have indicated that contamination is present in the vadose zone soils and in the capillary and upper saturated zone soils located adjacent to limits of the previous tank excavations. This contaminated soil zone may act as a continual source for groundwater contamination, and removal of the contaminated soils is preferred for minimizing potential future groundwater impact.

However, a preliminary feasibility review indicates that a great degree of difficulty and unusually high costs would be associated with removing the contaminated soil by excavation. These difficulties relate to two factors: (1) the uncertain extent of the contaminated soils and, (2) the facility/equipment above the contaminated zone. Contaminated soil in the capillary and upper saturated zone is present at depths of between approximately 10 feet and 15 feet bgs. Vadose zone soil contamination is located between 4 and 10 feet bgs in the Press Room UST area and at unknown depths in the Gasoline UST area.

Excavation of the impacted soil from the Press Room UST area would require removal of soil adjacent to and possibly under Buildings Nos. 10 and 21. Structural integrity of the buildings would therefore be a major concern. Detailed analysis by a structural engineer has not been performed at this time, but costs of this option would be relatively high. Removal of the impacted soils from the Press Room UST area by excavation is not recommended by SEACOR. Removal of impacted soils in the Gasoline UST area would be possible by removing the former pump island canopy, part of a fence, and temporarily disturbing the asphalt roadway and parking area west of the canopy.

6.3 Vacuum Extraction Vapor Recovery System

An alternative approach for remediation of the remaining impacted soil involves using a vacuum extraction vapor system (VES) in two to three vapor extraction wells (VEWs) to remove volatile contaminants from the soil. The VEWs would be installed in the vicinity of JR-2 in the Press Room and in the vicinity of JR-5 in the Gasoline UST area. One of the VEWs could also be designed to be used in connection with a groundwater pumping and treatment system. The VES would induce a vacuum on the soil in the vadose zone by extracting vapors from the soil to ground surface via the VEWs to facilitate soil remediation. The induced gas stream would be passed through a knockout vessel to remove entrained moisture before either being directly exhausted to the atmosphere or further treated using granular activated carbon adsorption or thermal oxidation, if required. Direct discharge of the extracted vapors to the atmosphere would require an air discharge permit.

The results of SEACOR's VET indicate that a VES, with the proper design, would be a feasible remediation alternative for the impacted soils remaining in the Press Room and Gasoline UST areas at the site.

6.4 Groundwater Pumping and Treatment System

The feasibility of a groundwater pumping and treatment system (GPTS) was reviewed as a method to contain, recover, and treat dissolved volatile organic compounds in groundwater in the vicinity of the Press Room and Gasoline UST areas. A total fluids removal pump would be placed in a 4-inch diameter recovery well that would be installed to a depth of approximately 30 feet bgs in the vicinity of the petroleum loading rack monitoring wells to remove groundwater. Discharged fluids could be processed through an oil/water separator and any non-aqueous product recovered would be pumped to a recovery tank while groundwater would be routed to an above-ground air stripper. The air stripper would remove volatile hydrocarbon contaminants from the groundwater. Pumped groundwater could also be treated using granular activated carbon (GAC) adsorption techniques prior to disposal. The treated groundwater would then be discharged into an exfiltration gallery for groundwater recharge or discharged to a sewer system or storm drain. Groundwater discharges will be permitted through the local governing agencies. In order to design a GPTS, aquifer testing would need to be conducted on existing monitoring wells.

6.5 Air Sparging

Air sparging is routinely utilized in conjunction with vapor extraction. Air sparging is conducted by introducing compressed air into the groundwater beneath the contaminant plume. The air volatilizes dissolved contaminates from the groundwater and the saturated portion of the aquifer matrix. The volatilized contaminates migrate to the vadose zone and are retrieved by the vapor extraction system.

Air sparging wells can be configured to encompass the contaminant plume. This distribution allows for the simultaneous treatment of the total plume and also attenuates further downgradient migration or dispersion of contaminants.

6.6 In Situ Bioremediation

A separate investigation would be required to determine if in situ bioremediation (ISB) is a feasible remediation alternative for this site. The process of ISB includes the pumping of contaminated groundwater via a recharge well, treatment of the groundwater in a microbe and nutrient-enriched environment such as in an above-ground batch/mixing tank, and discharging of the treated groundwater back into the subsurface using reinjection well or infiltration gallery. The ISB, therefore requires

circulation and treatment of contaminated groundwater. Reinjection of the microbe and nutrient-enriched fluids via reinjection wells or an infiltration gallery would also treat the hydrocarbon-impacted soils in the vadose zone.

ISB is not recommended for this site because of the following reasons:

- The feasibility of an ISB system for this site is uncertain, and the cost of an additional feasibility study would be relatively high;
- The cost of design, installation, operation and maintenance, and monitoring of most ISB systems is generally higher than most other pumping and treatment systems; and
- The time required for completion of most ISB systems is usually greater than most other remediation systems.

6.7 Passive Remediation

This remedial option relies on two related factors to minimize the impact of the contamination at the site: (1) eliminating infiltration of water to the contaminated zone to remove the primary mechanism for spread of the contaminants, and (2) natural processes to achieve a long-term reduction in contaminant levels. Passive remediation depends on the following:

- ***Natural Biodegradation*** conversion of hydrocarbons through natural anaerobic microbial activity.
- ***Volatilization*** the migration of volatile compounds into the atmosphere;
- ***Adsorption*** the immobilization of hydrocarbons through adherence to soil particles and the relatively high adsorptive potential of the hydrocarbons and volatile organic compounds;
- ***Non-Specific Oxidation*** the chemical oxidation of volatile organic compounds to carbon dioxide and water due to the presence of oxygen or other electron acceptors in the soil.
- ***Dispersion*** of the highly soluable volatile organic compounds throughout the uppermost aquifer.

6.8 Recommendations

Based on results of laboratory analysis of groundwater samples collected from the groundwater monitoring wells, no detectable concentrations of acetone, MIBK, isopropyl alcohol, or ethanol in the samples collected from JR-1 through JR-3 in the Press Room area and reduced concentrations of BTEX in JR-6 in the Gasoline UST area.

Based on the results of this and previous monitoring events, SEACOR recommends that groundwater monitoring and sampling of the three Press Room area wells and three Gasoline UST area wells be conducted to further monitor results of passive remediation. Recent concentration decreases may be the result of lower local water levels, which may be due to recent regional drought conditions.

Completion of the third year of quarterly monitoring of the groundwater monitoring wells is recommended to monitor contaminant levels through seasonal variations. Since the vapor sample analytical result from the VETs indicated the presence of moderate concentrations of hydrocarbons in the Gasoline UST area vadose zone and relatively low concentrations of various volatile organic compounds

in the Press Room area vadose zone, SEACOR recommends collection and analysis of soil samples from each area. An additional investigation, which would include installation of approximately four hand augered soil borings in each area, soil sample collection, and sample analysis, would be helpful in determining if the contaminants of concern are present in each area at concentrations that exceed DEQ Cleanup Standards. The investigation will also help determine if residual chemical concentrations pose any significant threat to shallow groundwater.

Meeting - James River Design Products (GTI)
3/26/93 John Ivezic - GTI
David Ernst - James River

We discussed the states of the sites and possible application of RCRA or ECD process instead of UST rules from this point forward.

I described the voluntary CR process and encouraged them to consider it for expedited oversight.

~~I don't retall the other~~

GTI and James River are both interested in moving the projects forward. They are working with consultants and will get back with us on ~~their~~ intended actions.

I recieved 3 documents for the Coated Product division and a deep groundwater investigation report.

Loren Gamer.

GRAPHICS
TECHNOLOGY INTERNATIONAL

P.O. Box 3349 (97208-3349)
12238 N. Portland Road
Portland, OR 97217
(503) 240-2613
Fax (503) 283-3025

John Ivezic
Project Engineer
Design Products

JAMES RIVER CORPORATION
PACKAGING BUSINESS
3400 N. Marine Drive, Portland, OR 97217-7746
Mailing Address: P.O. Box 17128, Portland, OR 97217-0128

DAVID L. ERNST
Site Maintenance & Environmental Mgr.
Flexible Packaging Group
503-286-1621 x 690

Brown and Caldwell
Consultants

This complete Report is located in File "James River Design Products" 26-89-088

JAMES RIVER CORPORATION

Deep Groundwater Monitoring Investigation at the North Portland Facility

November 18, 1992

1.0 INTRODUCTION

This report describes the results of the Deep Groundwater Monitoring Investigation performed by Brown and Caldwell Consultants (BCC) at the James River Corporation (JRC) North Portland facility. The work was performed as authorized by the JRC under Purchase Order 91105656. The following information is covered in this report:

- **Background information**—site location, description, activities, and history; a description of the regional and site hydrogeology; and investigative history
- **Scope of work**—a description of the field and laboratory methods and procedures used during the investigation
- **Investigation results**—an interpretation of new hydrogeologic data and the analytical results of soil and groundwater samples collected during this investigation
- **Conclusions and recommendations.**

2.0 BACKGROUND

2.1 Site Location and Description

The JRC is located at 3400 North Marine Drive in Portland, Multnomah County, Oregon (Figure 2-1). Its longitudinal and latitudinal coordinates are 122° 41′ 50.7″ W3 and 45° 36′ 38.7″ N, respectively (Figure 2-1).

Occupying an area of approximately 29 acres in an industrial section of North Portland, the JRC is bound to the north by North Marine Drive and is separated from the Columbia River and North Portland Harbor. An east-west trending railroad owned by Peninsula Terminal Company divides the site from an undeveloped wetland and manufacturing buildings. To the south of the JRC wetland is the City of Portland golf course, Heron Lakes. The Portland Union Stockyard is immediately east of the JRC facility, and a north-south trending mainline of the Burlington Northern Railroad runs along the site's western boundary (Figure 2-2).

The main feature on site is the 530,000-square-foot manufacturing complex which houses Graphics Technology International, Inc. (GTI), the JRC's Coated Products Division (CPD), and a large warehouse. A smaller, 30,000-square-foot building complex occupying the northeast corner of the property accommodates the JRC's CZ-Inks Division (CZD). Other prominent features on site include the GTI Solvent Recovery (SR) area in the northwest corner; the GTI underground storage tank area; the GTI aboveground Solvent Laden Duct (SLD), which extends from the southeast corner of building No. 6 to the boiler house; and a paved, outdoor drum storage area immediately east of the warehouse (Figure 2-2).

SEACOR
Science & Engineering Analysis Corporation

October 1, 1993

Mr. Dave Ernst
Plant Maintenance Manager
James River Corporation
North Portland Facility
3400 North Marine Drive
Portland, Oregon 97127

RE: Proposal for Additional Soil and Groundwater Assessment
Former Gasoline UST Area
James River Corporation Coated Products Division
North Portland Facility, Portland, Oregon
SEACOR Proposal No. 15-93-106

Dear Mr. Ernst:

This letter presents a proposal for additional assessment of soil and groundwater regarding the extent of volatile aromatic hydrocarbons in the vicinity of well JR-5, located in the Former Gasoline UST Area of JRC's Coated Products Division. The JRC North Portland Facility is located at 3400 North Marine Drive in Portland, Oregon.

Background

Ongoing groundwater monitoring activities at the site have been conducted by SEACOR on a quarterly basis during the past three years for the three groundwater monitoring wells JR-4, JR-5, and JR-6 in the former Gasoline UST area. The wells were installed in September 1989 during soil and groundwater investigations conducted by Brown and Caldwell Consultants (BCC). The soil and groundwater investigations were conducted following UST decommissioning activities, which were completed in May 1989. The previous BCC UST and soil and groundwater investigations indicated the presence of hydrocarbons in the soil and groundwater in the vicinity of the Gasoline UST area. In addition to quarterly monitoring at the site, SEACOR conducted a soil boring investigation in the Gasoline UST area and a pilot vapor extraction test (PVET) on well JR-5 to evaluate vadose zone contaminant concentrations and vapor flow characteristics.

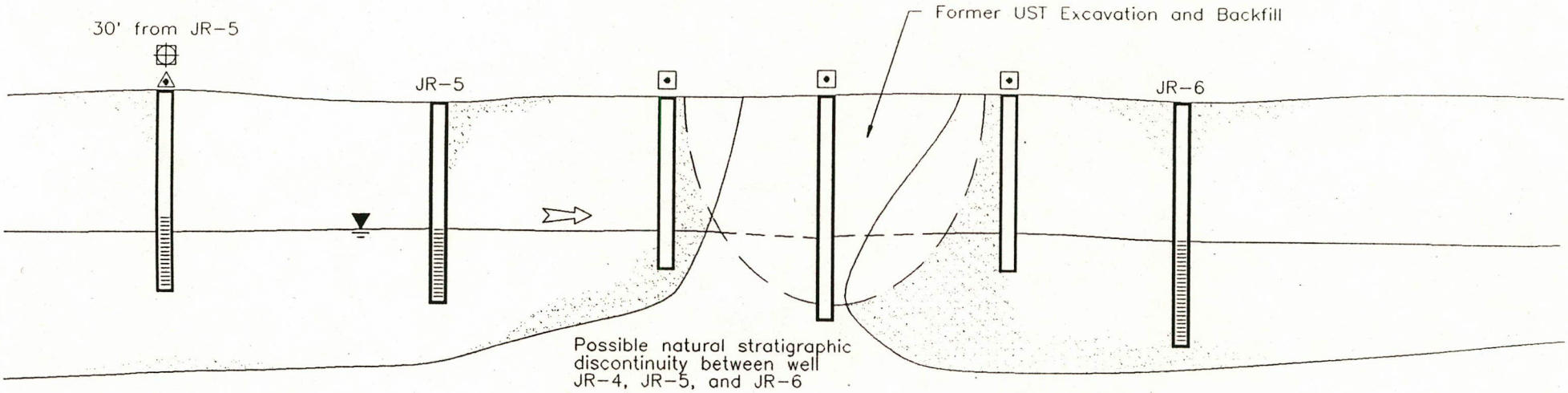
7614 S.W. Mohawk Street, P.O. Box 1508, Tualatin, OR 97062-1508 (503) 691-2030 Ph (503) 692-7074 Fax

Existing Data Evaluation

Based on an evaluation of the existing monitoring well network, groundwater analytical data, quarterly water level elevations, and PVET data, SEACOR presents the following conclusions.

Three years of quarterly groundwater monitoring at the Gasoline UST Area have indicated fluctuating groundwater chemical conditions with a general decrease in concentrations of the volatile aromatic compounds benzene, toluene, ethylbenzene, and xylene (BTEX). However, benzene concentrations in the Gasoline UST area well JR-5 have increased during the last two quarters and remain above the Oregon Department of Environmental Quality (DEQ) Groundwater Cleanup Standard of 5 parts per billion (ppb). The increase in benzene concentration may be the result of solubilization of residual product in the vadose zone (as suggested by the PVET results) by rising groundwater levels (which has occurred during the January and April 1993 quarters). Vacuum measured in wells JR-4 and JR-6 during the PVET conducted at JR-5 indicated a relatively small radius of influence between the wells. While the PVET results indicated the presence of vadose zone hydrocarbons, the analytical results from soil boring samples collected from the area did not indicate the presence of hydrocarbons at or above the method detection limits.

The Gasoline UST Area wells were screened and completed in sandy clay (which generally exhibits low hydraulic conductivity) and in a hydrologic regime of moderate hydraulic gradients (0.01 feet/foot). Well JR-5 was completed hydrologically upgradient of the former gasoline UST while wells JR-4 and JR-6 were respectively completed crossgradient and immediately downgradient of the UST. Given these facts and the duration of time that has passed since the beginning of the quarterly monitoring program, benzene occurring in well JR-5 should be detected in groundwater in the vicinity of wells JR-4 and especially JR-6. However, such impacts have not been detected during past analyses which may indicate that well JR-5 and wells JR-4 and JR-6 are either completed in different water-bearing zones or a non-continuous water-bearing zone, or that attenuation of residual product has occurred on the water-bearing zone matrix (Figure 1). In addition, no groundwater analytical information upgradient of well JR-5 currently exists. The proposed scope of work is designed to further delineate the hydrologic regime in the vicinity of the Gasoline UST Area. This information should also be obtained to satisfy both DEQ concerns of a possible upgradient source in conjunction with eventual site closure and/or remediation system design requirements. As a result of these conclusions, we present the following remedial objectives and scope of work.



LEGEND

- Sandy CLAY formation
- Proposed Task 2 Monitoring Well
- Proposed Task 3 Soil Boring
- JR-5 — Existing Monitoring Well
- Groundwater Flow Direction

N

Drawing is not to scale.

SEACOR
ENVIRONMENTAL ENGINEERING
TUALATIN, OREGON

JAMES RIVER CORPORATION
3400 N. MARINE DRIVE
PORTLAND, OREGON

GASOLINE UST AREA HYPOTHETICAL STRATIGRAPHIC PROFILE

FIGURE:

JOB: 15-93-106 DRAWN: KPW DATE: 10/04/93 APPROVED: GBH DATE: 10-4-93

Remedial Objectives and Scope

The proposed remedial objectives for the additional soil and groundwater assessment in the former Gasoline UST Area includes the following:

- Evaluation of soil and groundwater chemical conditions hydraulically upgradient from well JR-5.
- Determination of the extent of the JR-5 hydraulic zone between JR-5 and JR-6 and potential capillary fringe soil and groundwater contaminant concentrations within that zone.
- Assessment of the extent of contamination within the vicinity of well JR-5.
- Possible assessment of hydraulic conditions between the Gasoline UST wells JR-4, JR-5, and JR-6 to determine continuity of the water-bearing zone.
- Further characterization of groundwater in the former Gasoline UST Area wells via a 4th year of quarterly groundwater monitoring.
- Evaluation of feasible remediation alternatives (if remediation is necessary) for the cleanup of contaminated soils and groundwater remaining in the former Gasoline UST Area.

To accomplish these objectives, the anticipated scope of work includes the following:

- Drilling of one soil boring to the water table at a position located hydraulically upgradient of well JR-5 with soil sample collection for field screening purposes and lithologic characterization. The boring will be completed as a 2-inch monitoring well to facilitate permanent background monitoring. One groundwater sample will be collected and analyzed for BTEX to determine the potential for contaminant sources upgradient of JR-5.
- Drilling of three soil borings to the water table at locations between JR-5 and JR-6 with soil and groundwater sample collection, field screening, and possible analysis to determine the presence of BTEX contamination and assess the hydraulic continuity of the water bearing zone.

- Optional performance of a water-bearing zone pumping test (PT) between the test well JR-5 and observation wells JR-4 and JR-6 to assess hydraulic continuity of the water-bearing zone. This PT will be accomplished if soil boring and groundwater sample analytical results do not indicate the presence of BTEX contamination.

- Collection and analysis of groundwater samples from the pumping well both before the PT (if performed) and after well recovery to evaluate the effect of pumping on BTEX concentrations and to assess the extent of BTEX contamination within the immediate vicinity of the pumping well.

- Collection and analysis of groundwater samples from an ongoing 4th year of quarterly groundwater monitoring in the Gasoline UST area. Well JR-5 would be sampled during all 4 quarters while wells JR-4 and JR-6 would be sampled on a semi-annual basis. The proposed background well will be sampled during the first and second quarters. Collection of the groundwater sample from well JR-5 subsequent to the PT (if performed) would serve as the initial quarterly sample.

- Preparation of quarterly status reports which would present an evaluation of the respective quarterly groundwater monitoring data. The initial quarterly status report will also contain the results of the remediation field characterization and analytical testing information. An evaluation of remedial options will be presented and a recommendation will be made regarding the most appropriate remedial action to be taken at the site.

Details of the proposed scope of work for this investigation is included in Attachment 1. The estimated cost of the investigation is $28,889.00. Details of the cost estimate are included in Attachment 2.

Thank you for the opportunity to submit this proposal. We look forward to servicing your environmental needs on this project. If you have any questions concerning this proposed scope of work or estimated costs, please call us at (503) 691-2030.

Sincerely
Science & Engineering Analysis Corporation

Joseph B. Hunt, RG
Senior Scientist/Project Manager

Randall T. Rees
Principal Scientist

JBH/RTR:lew

Attachments (2)

ATTACHMENT 1
PROPOSED SCOPE OF WORK
FOR ADDITIONAL SOIL AND GROUNDWATER ASSESSMENT
FORMER GASOLINE UST AREA

Task 1
Project Management and Workplan Preparation

Project management will consist of coordinating all field activities between JRC, regulatory agencies, and the subcontractors. Project management will also consist of development of this investigation scope of work.

Project management will be conducted during the aquifer pumping test, soil boring, soil and groundwater sampling and sample transport, evaluation of remediation alternatives, and report development, and project health and safety. In addition, progress billings and invoice review and submittal will also be included under project management.

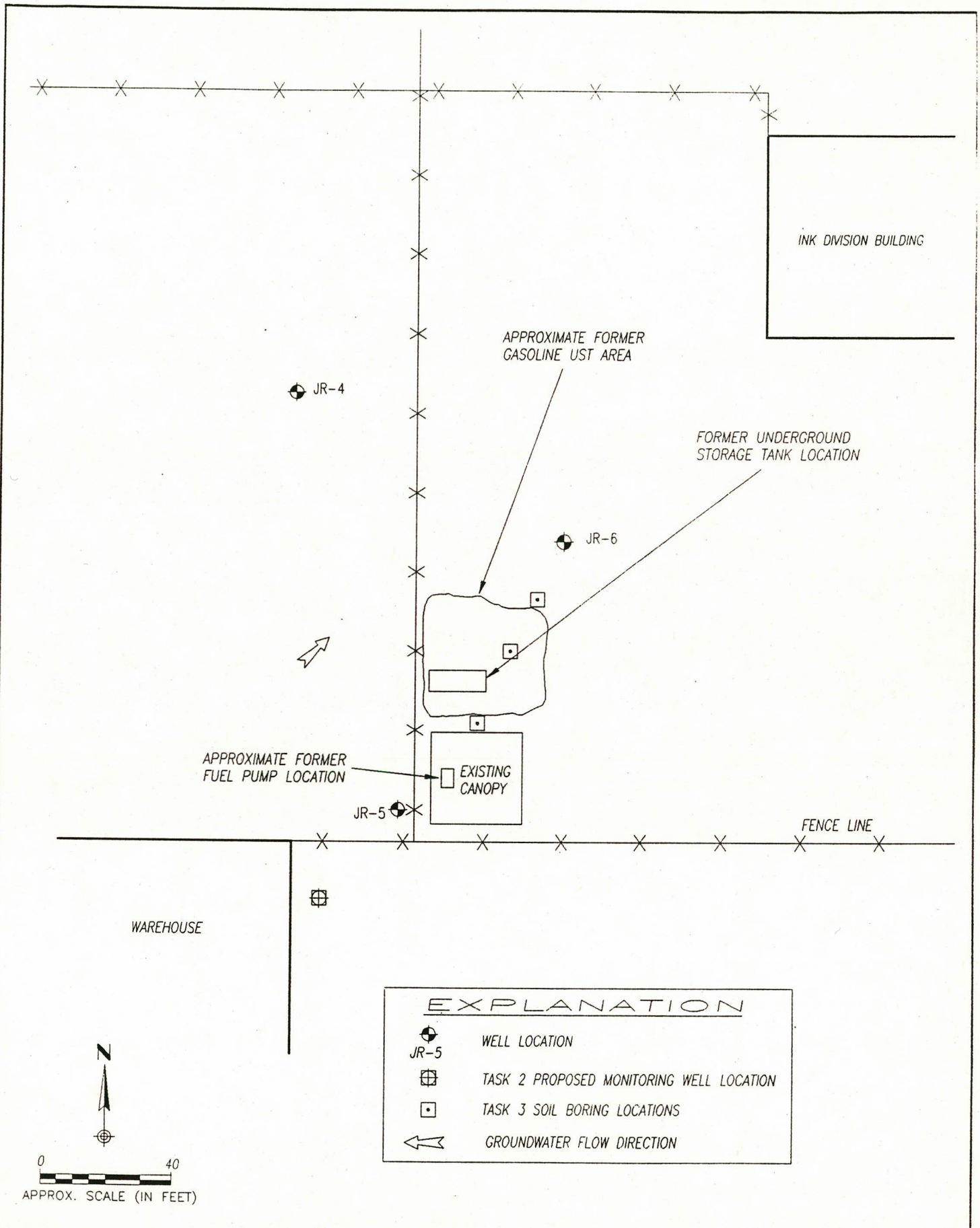
Task 2
Soil Boring/Monitoring Well Installation/
Soil and Groundwater Sampling Upgradient of Well JR-5

One soil boring is proposed for drilling upgradient of well JR-5 with soil sample collection for field screening and lithologic characterization, and groundwater sample collection and analysis for BTEX (Figure 2). The boring will be completed as a 2-inch monitoring well to facilitate collection of an upgradient groundwater sample. The groundwater sample results from the well should provide a determination of the upgradient extent (if any) of BTEX. The boring will be drilled below the water table with a truck-mounted hollow-stem auger drilling rig. Soil samples will be collected from the capillary fringe zone with a split-spoon sampler. Soil boring samples will be subjected to field-screening with a photoionization detector and a water sheen test to determine the potential presence of fuel hydrocarbon. The groundwater sample will be analyzed for BTEX by EPA Method 8020. Lithologic data from the borings will be used to further characterize geology in the area.

Soil cuttings will be drummed and disposed of based on the soil field screening results.

Task 3
Soil Boring/Soil and Groundwater Sampling between Wells JR-5 and JR-6

Three soil borings are proposed for drilling between wells JR-5 and JR-6 with initial soil sample collection for lithologic characterization and field screening (Figure 2). Lithologic and field screening data from the boring samples should allow further geologic



SEACOR
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JAMES RIVER CORPORATION
3400 N. MARINE DRIVE
PORTLAND, OREGON

GASOLINE UST AREA
PROPOSED SOIL BORING
AND WELL LOCATIONS

FIGURE:
2

characterization between the wells and provide a relative determination of the continuity of the JR-5 zone and potential BTEX contamination. The borings will be drilled below the water table with a truck-mounted hollow-stem auger drilling rig. Soil samples will be collected from the capillary fringe zone with a split-spoon sampler and field-screened via visual, PID, and water sheen tests. If the field screening results from the soil boring samples collected from each side of the former UST excavation indicate the presence of fuel hydrocarbon contamination, the soil samples will be submitted for laboratory analysis. The soil sample collected from the boring in the center of the former excavation will be evaluated for lithologic characterization only. Groundwater will be allowed to accumulate in the borings and samples will be collected for screening purposes. If the field screening results from the soil and groundwater samples collected from the closest downgradient boring to well JR-5 indicate the presence of fuel hydrocarbon contamination, a 2-inch monitoring well may be installed at the location to facilitate collection of a groundwater sample. Soil and groundwater samples (if collected) would be analyzed for BTEX by EPA Method 8020.

Subsequent to sample collection, the boreholes will be abandoned by a hydrated bentonite grout according to Oregon Department of Water Resources (ODWR) requirements and the ground surface restored with concrete or asphalt. Soil cuttings will be drummed and disposed of on site based on the soil sample field screening results.

Task 4
Water-Bearing Zone Pumping Test (optional)

Should the soil boring and groundwater sample analytical results prove inconclusive as to the extent of both BTEX contamination and the continuity of the water-bearing zone, a 24-hour water-bearing zone pumping test (PT) will be completed at the site to assess hydraulic conditions within the vicinity of well JR-5, assess the continuity of the water-bearing zone between the Gasoline UST wells JR-4, JR-5, and JR-6, and assess the extent of contamination within the vicinity of well JR-5. A 24-hour time period was selected to stress the water-bearing zone based on the unconfined nature of the zone, the low hydraulic conductivity of the subsurface sandy clay formation, and an assumed optimum pumping rate of 2 to 3 gallons per minute in the pumping well. The actual pumping rate will be established by a step drawdown test prior to the actual pump test. The PT will consist of pumping groundwater from well JR-5 for a 24-hour period and measuring the potential drop in hydraulic head at wells JR-4 and JR-6. A 1 5/8-inch diameter Grunfos pump will be used during the PT. During the PT, water levels at each well will be monitored using a multi-channel automated data logging system. The PT will occur over a period of 24 hours (not including preparation and setup) followed by approximately 12 water level recovery measurements.

Data from the PT will be used to determine hydrogeologic properties (such as hydraulic conductivity and transmissivity) of the uppermost water-bearing zone in the area. The data will also be used to assess if wells JR-4, JR-5, and JR-6 are hydraulically connected and to determine appropriate remedial alternatives for the site. Given the distance of JR-4 and JR-6 from JR-5 and the low permeability of the sandy clay formation within which the wells exist, it is possible that the pump test may not indicate hydraulic continuity. In that even, the pump test data will be used to evaluate hydraulic conditions in the immediate vicinity of well JR-5.

Prior to and after the PT, one groundwater sample will be collected from well JR-5 and analyzed for BTEX under EPA Method 8020. The data will be used to determine whether the observed BTEX contamination was local and purged via the pumping test or whether a constant source exists within the vicinity of the well. The sample result will be used in conjunction with the other data to formulate possible remediation alternatives, should remediation be determined as a necessary option.

Water generated during the PT will be pumped into a 4,200-gallon Baker storage tank. Assuming a maximum flow rate of 2-3 gallons per minute, it is estimated that approximately 4,000 gallons of groundwater will be generated during the PT. Water contained in the tank will be vigorously aerated to with an airstone hooked to an air compressor to induce volatilization of volatile compounds into ambient air. One water sample will be collected from the storage tank and analyzed for BTEX characterization prior to disposal in an on-site storm water drain. Tank water disposal will be conducted with the approval of DEQ and SEACOR will coordinate any required permitting for disposal.

Task 5
Quarterly Groundwater Sampling

Groundwater samples will be collected from the Gasoline UST area wells during a 4th year of quarterly groundwater monitoring. Well JR-5 will be sampled on a quarterly basis and wells JR-4 and JR-6 will be sampled on a semi-annual basis. The proposed background well will be sampled during the first and second quarters to evaluate upgradient groundwater conditions. Well samples will be analyzed for BTEX under EPA Method 8020. The sample collected from well JR-5 under normal conditions or subsequent to the PT (if performed) will serve as the initial quarterly sample. Quality control samples will include one trip blank (all four quarters) and a duplicate sample from well JR-5 (second and fourth quarters).

Task 6
Data Evaluation/
Selection of Remedial Alternatives and Quarterly Status Report Preparation

Quarterly status reports, which evaluate and summarize the quarterly monitoring data, will be presented. The initial quarterly report will present the most effective course of action for groundwater remediation (if necessary) based on the proposed remediation investigative activities. The course of action will be justified based on data from the Correction Action Plan report and the remedial investigation. The draft status reports will be submitted to JRC, followed by a final report addressing any JRC comments. Copies of each final status report will also be submitted to DEQ following approval by JRC.

ATTACHMENT 2
PROPOSED COST ESTIMATE
FOR ADDITIONAL SOIL AND GROUNDWATER ASSESSMENT
FORMER GASOLINE UST AREA

Task Number	Description		Estimated Cost
1.	**Project Management and Workplan Preparation**		
	SEACOR Labor		
	-Principal Engineer (2 hrs)	$	210
	-Senior Hydrogeologist (25 hrs)	$	2,375
	Reimbursables		200
	Subtotal Task 1	**$**	**2,785**
2.	**Soil Boring/Monitoring Well Installation/ Soil and Groundwater Sampling Upgradient of Well JR-5**		
	SEACOR Labor		
	-Staff Geologist (4 hrs)	$	260
	Field sampling equipment and mileage		100
	Laboratory (EPA Method 8020)		
	-2 samples (by PEL Lab, billed direct to JRC)		(209)
	Drilling subcontractor		
	(Geo-Tech, billed directly to JRC)		(875)
	Subtotal Task 2	**$**	**1,444**
3.	**Soil Boring/Soil and Groundwater Sampling between Wells JR-5 and JR-6**		
	SEACOR Labor		
	-Staff Geologist (8 hrs)	$	520
	Field sampling equipment and mileage		100
	Laboratory (EPA Method 8020)		
	-3 samples (by PEL Lab, billed direct to JRC)		(314)
	Drilling subcontractor		
	(Geo-Tech, billed directly to JRC)		(1,155)
	Subtotal Task 3	**$**	**2,089**

4.	**Water-Bearing Zone Pumping Test (optional)**		
	SEACOR Labor		
	-Field: Associate Geologist (34 hrs)	$	2,890
	-Data evaluation: Associate Geologist (23 hrs)		1,955
	Laboratory (EPA Method 8020)		
	-2 samples (by PEL Lab, billed direct to JRC)		(210)
	-Water Discharge labor: Staff Geologist (8 hrs)		520
	Equipment rental (pump, data logger, etc)		850
	Storage tank rental (4,100 gallon)		400
	Air compressor		136
	Discharge pump		50
	Subtotal Task 4	**$**	**7,011**
5.	**Quarterly Groundwater Sampling**		
	SEACOR Labor		
	-Field: Staff Geologist (44 hrs)	$	2,860
	Laboratory water sample (15 samples) (by PEL Lab, billed direct to JRC)		(1,575)
	Field equipment and mileage		400
	Subtotal Task 5	**$**	**4,835**
6.	**Data Evaluation/Selection of Remedial Alternatives and Quarterly Status Report Preparation**		
	SEACOR Labor		
	-Principal Engineer (5 hrs)	$	500
	-Senior Hydrogeologist (25 hrs)		2,375
	-Associate Geologist (40 hrs)		3,400
	-Project Geologist (30 hrs)		2,250
	-Word Processing (20 hrs)		900
	-Drafting (20 hrs)		900
	Reimbursables		400
	Subtotal Task 6	**$**	**10,725**
	TOTAL ESTIMATED PROJECT COST	**$**	**28,889**
	TOTAL ESTIMATED SEACOR COST	**$**	**24,551**

ANALYTICAL REPORT

Tim O'Gara
Brown and Caldwell
Suite 200
9620 S.W. Barbur Blvd.
Portland, OR 97219

06/18/1993
Job No.: 93.00559

Project Name: James River DW
Date Received: 06/11/1993

Sample Number: 16564
Sample Description: DW-1D

PARAMETERS	METHODS	RESULTS		DATE ANALYZED
8010 HALOGENATED VOC (W)				
Dilution Factor		1		06/15/1993
Chloromethane	8010	<0.5	ug/L	06/15/1993
Bromomethane	8010	<0.5	ug/L	06/15/1993
Vinyl chloride	8010	<2.0	ug/L	06/15/1993
Chloroethane	8010	<0.5	ug/L	06/15/1993
Methylene chloride	8010	<10	ug/L	06/15/1993
Trichlorofluoromethane	8010	<0.5	ug/L	06/15/1993
1,1-Dichloroethene	8010	<0.5	ug/L	06/15/1993
1,1-Dichloroethane	8010	<0.5	ug/L	06/15/1993
trans-1,2-Dichloroethene	8010	<0.5	ug/L	06/15/1993
cis-1,2-Dichloroethene	8010	<0.5	ug/L	06/15/1993
Chloroform	8010	<0.5	ug/L	06/15/1993
1,2-Dichloroethane	8010	<0.5	ug/L	06/15/1993
1,1,1-Trichloroethane	8010	2.2	ug/L	06/15/1993
Carbon Tetrachloride	8010	<0.5	ug/L	06/15/1993
Bromodichloromethane	8010	<0.5	ug/L	06/15/1993
1,2-Dichloropropane	8010	<0.5	ug/L	06/15/1993
trans-1,3-Dichloropropene	8010	<0.5	ug/L	06/15/1993
Trichloroethene	8010	11.2	ug/L	06/15/1993
Dibromochloromethane	8010	<0.5	ug/L	06/15/1993
1,1,2-Trichloroethane	8010	<0.5	ug/L	06/15/1993
cis-1,3-Dichloropropene	8010	<0.5	ug/L	06/15/1993
2-Chloroethylvinyl ether	8010	<1.0	ug/L	06/15/1993
Bromoform	8010	<0.5	ug/L	06/15/1993
1,1,2,2-Tetrachloroethane	8010	<0.5	ug/L	06/15/1993
Tetrachloroethene	8010	6.3	ug/L	06/15/1993
Chlorobenzene	8010	<0.5	ug/L	06/15/1993
1,3-Dichlorobenzene	8010	<0.5	ug/L	06/15/1993
1,2-Dichlorobenzene	8010	<0.5	ug/L	06/15/1993
1,4-Dichlorobenzene	8010	<0.5	ug/L	06/15/1993

SURROGATE REPORT

Tim O'Gara
Brown and Caldwell
Suite 200
9620 S.W. Barbur Blvd.
Portland, OR 97219

06/18/1993
Job No.: 93.00559

Project Name: James River DW
Date Received: 06/11/1993

SURROGATES	METHODS	RESULTS		DATE ANALYZED
Sample Number 16560	Sample Description FB			
Br,Cl-Propane (Surr.)	8010	103	%	06/14/1993
Sample Number 16561	Sample Description DW-3			
Br,Cl-Propane (Surr.)	8010	103	%	06/15/1993
Sample Number 16562	Sample Description DW-2			
Br,Cl-Propane (Surr.)	8010	104	%	06/15/1993
Sample Number 16563	Sample Description DW-1			
Br,Cl-Propane (Surr.)	8010	99	%	06/15/1993
Sample Number 16564	Sample Description DW-1D			
Br,Cl-Propane (Surr.)	8010	97	%	06/15/1993

QUALITY CONTROL REPORT
CONTINUING CALIBRATION VERIFICATION

Brown and Caldwell
Suite 200
9620 S.W. Barbur Blvd.
Portland, OR 97219

Date: 06/18/1993

NET Job Number: 93.00559

Contact: Tim O'Gara
Project: James River DW

Analyte	CCV True Concentration	Concentration Found	Percent Recovery
8010 HALOGENATED VOC (W)			
Chlorobenzene	20	20	100.0
1,2-Dichloroethane	20	22.2	111.0
1,1-Dichloroethene	20	22.8	114.0
Trichloroethene	20	20.1	100.5

CCV - Continuing Calibration Verification

QUALITY CONTROL REPORT
MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Brown and Caldwell
Suite 200
9620 S.W. Barbur Blvd.
Portland, OR 97219

Date: 06/18/1993

NET Job Number: 93.00559

Contact: Tim O'Gara
Project: James River DW

Analyte	Matrix Spike Result	Sample Result	Spike Amount	Units	Percent Recovery	MSD Result	MSD Spike Amount	Units	Percent Recovery	MS/MSD RPD
8010 HALOGENATED VOC (W)										
1,1-Dichloroethene	24.4	<0.5	20	ug/L	122.0	23.3	20	ug/L	116.5	4.6
1,2-Dichloroethane	24.1	<0.5	20	ug/L	120.5	22.6	20	ug/L	113.0	6.4
Trichloroethene	20.6	<0.5	20	ug/L	103.0	19.2	20	ug/L	96.0	6.9
Chlorobenzene	21.2	<0.5	20	ug/L	106.0	19.3	20	ug/L	96.5	9.3

NOTE: Matrix Spike Samples may not be samples from this job.

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
dil.= Diluted Out

QUALITY CONTROL REPORT
BLANKS

Brown and Caldwell
Suite 200
9620 S.W. Barbur Blvd.
Portland, OR 97219

Date: 06/18/1993

NET Job Number: 93.00559

Contact: Tim O'Gara
Project: James River DW

Analyte	Blank Analysis	Units
8010 HALOGENATED VOC (W)		
Bromodichloromethane	<0.5	ug/L
Bromoform	<0.5	ug/L
Bromomethane	<0.5	ug/L
Carbon Tetrachloride	<0.5	ug/L
Chlorobenzene	<0.5	ug/L
Chloroethane	<0.5	ug/L
2-Chloroethylvinyl ether	<5	ug/L
Chloroform	<0.5	ug/L
Chloromethane	<0.5	ug/L
Dibromochloromethane	<0.5	ug/L
1,2-Dichlorobenzene	<0.5	ug/L
1,3-Dichlorobenzene	<0.5	ug/L
1,4-Dichlorobenzene	<0.5	ug/L
1,1-Dichloroethane	<0.5	ug/L
1,2-Dichloroethane	<0.5	ug/L
1,1-Dichloroethene	<0.5	ug/L
trans-1,2-Dichloroethene	<0.5	ug/L
cis-1,2-Dichloroethene	<0.5	ug/L
1,2-Dichloropropane	<0.5	ug/L
cis-1,3-Dichloropropene	<0.5	ug/L
trans-1,3-Dichloropropene	<0.5	ug/L
Methylene chloride	<10	ug/L
1,1,2,2-Tetrachloroethane	<0.5	ug/L
Tetrachloroethene	<0.5	ug/L
1,1,1-Trichloroethane	<0.5	ug/L
Trichloroethene	<0.5	ug/L

Advisory Control Limits for Blanks:
Metals/Wet Chemistry/ Conventionals/GC - all compounds should be less than the Reporting Limit.
GC/MS - Semi-Volatiles - all compounds should be less than the Reporting Limit except for phthalates which should be less than 5 times the reporting limit.

NET NATIONAL ENVIRONMENTAL TESTING, INC.

93.00559

PORTLAND DIVISION, 17400 SW UPPER BOONES FERRY RD., SUITE 260, PORTLAND, OR 97224
(503) 624-5449 PHONE (503) 639-6889 FAX

CHAIN OF CUSTODY RECORD

COMPANY Brown & Caldwell
ADDRESS 9620 SW Barbur, #700 Portland
PHONE (503) 244-7005 FAX
PROJECT NAME/LOCATION James River DW
PROJECT NUMBER
PROJECT MANAGER Tim O'Hara

SAMPLED BY Cliff Herman (PRINT NAME) Cliff Herman SIGNATURE
(PRINT NAME) SIGNATURE

TURNAROUND TIME STD DAY (S)

DATE	TIME	SAMPLE ID/DESCRIPTION	GRAB	COMP	# OF CONTAINERS	MATRIX	PRESERVED Y/N	ANALYSES: 8010	COMMENTS
6/11/93		FB			2	AQ	N	X	
"		DW-3			3	"	"	X	
"		DW-2			3	"	"	X	
"		DW-1			3	"	"	X	
↓		DW-10			2	↓	↓	X	

RESULTS TO: Tim O'Hara
INVOICE TO:

RELINQUISHED BY:	DATE/TIME	RECEIVED BY:	RELINQUISHED BY:	DATE/TIME	RECEIVED BY:
Cliff Herman	6/11/93 1520				
RELINQUISHED BY:	DATE/TIME	RECEIVED BY:	RELINQUISHED BY:	DATE/TIME	RECEIVED FOR LABORATORY BY:
					Randy T. McKee

METHOD OF SHIPMENT
REMARKS:

PT 1 - ORIGINAL - WHITE PT 2 - NET PROJECT MANAGER - YELLOW PT 3 - CUSTOMER COPY - PINK

APPENDIX D
DEEP GROUNDWATER MONITORING ANALYTICAL RESULTS TO-DATE

APPENDIX D

Deep Groundwater Monitoring Analytical Results
James River Corporation
To-Date

Monitoring Well Number/ date sampled	Halogenated Volatile Organic Compound Analysis[a]		
	1,1,1-Trichloroethane (TCA)	Trichloroethene (TCE)	Tetrachloroethane (PCE)
DW-1			
5/10/91	<2.0	8.7	3.7
6/11/93	2.0	11.4	7.0
DW-2			
5/10/91	<2.0	2.3	7.4
6/11/93	2.0	9.2	9.3
DW-3			
5/10/91	<2.0	<2.0	6.1
6/11/93	1.9	4.1	8.8

[a] Analysis by EPA Method 8010, concentrations in parts per billion (ppb).

APPENDIX E
FIELD GROUNDWATER QUALITY DATA

APPENDIX E

Field Groundwater Quality Data
James River Corporation
June 11, 1993

Monitoring Well DW-1

Cumulative Well Volumes Purged	pH	Temperature (in degrees F)	Conductivity (in micromhos/cm)
1	5.97	57.1	233
2	6.08	58.8	257
3	6.27	58.6	254

Total Gallons Removed = 66.0

Monitoring Well DW-2

Cumulative Well Volumes Purged	pH	Temperature (in degrees F)	Conductivity (in micromhos/cm)
1	6.11	55.0	205
2	6.26	54.9	202
3	6.25	55.2	201

Total Gallons Removed = 72.0

Monitoring Well DW-3

Cumulative Well Volumes Purged	pH	Temperature (in degrees F)	Conductivity (in micromhos/cm)
1	5.52	58.3	255
2	5.83	56.1	249
3	5.93	57.0	249

Total Gallons Removed = 69.0

A significant volume of groundwater is pumped from the deep aquifer for plant production use, creating a cone depression around the plant production wells. The contamination found in the deep groundwater monitoring wells most likely originates from an off-site source as the monitoring wells lie upgradient to any potential on-site contamination source.

Please feel free to contact me at (503) 244-7005 if you have any questions concerning this report.

Very truly yours,

BROWN AND CALDWELL

Tim O'Gara, RG
Project Manager

TFO:jlj

APPENDIX A
FIELD PROCEDURES FOR GROUNDWATER MONITORING

APPENDIX A

Field Procedures
for
Groundwater Monitoring

A visual inspection is made of the surface monument for each groundwater monitoring well prior to opening. Wells are then opened to allow for pressure equalization. Static water level measurements are collected and recorded prior to purging and sampling.

The pump and hose are decontaminated prior to purging each well. One field blank is collected after arriving on site by pouring laboratory grade deionized water into a sampling vial. The vial is stored in a cooler along with the rest of the samples and after sampling is completed, the field blank is returned to the laboratory with the rest of the samples.

In each well, a submersible pump is lowered to approximately 100 feet and well purging is continued until at least three well volumes are removed. Groundwater quality parameters (water temperature, pH, and specific conductance) are monitored and recorded at regular intervals during the purging of each well. Field groundwater quality data for each well sampled is summarized in Appendix E.

A final groundwater level measurement is made and recorded just prior to sample collection to insure that the well has recovered to 90 percent of the initial static water level. Groundwater samples are collected by submersing a disposable bailer approximately 100 feet in each well. The water sample is then transferred directly into appropriate sampling containers. The sampling containers are labeled according to sample location, immediately stored in an iced container, and delivered to the analytical laboratory with chain-of-custody documents.

Following sample collection the well cap is replaced and locked and the well monument sealed.

APPENDIX B
DEEP GROUNDWATER ELEVATION DATA TO-DATE

APPENDIX B

Deep Groundwater Elevation Data
James River Corporation
To-Date

Well Number/ date	Top-of-Casing elevation (feet)[a]	Depth to water (feet)	Water level elevation (feet)	Change since last measurement (feet)
DW-1	38.29			
5/10/91		29.03	9.26	-
6/11/93		28.48	9.81	0.55
DW-2	23.52			
5/10/91		14.16	9.36	-
6/11/93		13.53	9.99	0.63
DW-3	27.72			
5/10/91		18.38	9.34	-
6/11/93		17.82	9.90	0.56

[a] Elevation above mean sea level.

NATIONAL ENVIRONMENTAL TESTING, INC.

Portland Division
17400 SW Upper Boones Ferry Rd.
Suite #260
Portland, OR 97224
Tel: (503) 624-5449
Fax: (503) 639-6889

Tim O'Gara
Brown and Caldwell
Suite 200
9620 S.W. Barbur Blvd.
Portland, OR 97219

Date: 06/18/1993
NET Account No.: 5000
NET Job Number: 93.00559

Project: James River DW

Sample analysis in support of the project referenced above has been completed and results are presented on the following pages. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Sample Number	Sample Description	Matrix Type	Date Taken	Date Received
16560	FB	GROUND WATER	06/11/1993	06/11/1993
16561	DW-3	GROUND WATER	06/11/1993	06/11/1993
16562	DW-2	GROUND WATER	06/11/1993	06/11/1993
16563	DW-1	GROUND WATER	06/11/1993	06/11/1993
16564	DW-1D	GROUND WATER	06/11/1993	06/11/1993

Approved by:

Marty French
NET, INC. Division Manager

OCEAN GROUP

NET®

ANALYTICAL REPORT

Tim O'Gara
Brown and Caldwell
Suite 200
9620 S.W. Barbur Blvd.
Portland, OR 97219

06/18/1993
Job No.: 93.00559

Project Name: James River DW
Date Received: 06/11/1993

Sample Number	Sample Description
16560	FB

PARAMETERS	METHODS	RESULTS		DATE ANALYZED
8010 HALOGENATED VOC (W)				
Dilution Factor		1		06/14/1993
Chloromethane	8010	<0.5	ug/L	06/14/1993
Bromomethane	8010	<0.5	ug/L	06/14/1993
Vinyl chloride	8010	<2.0	ug/L	06/14/1993
Chloroethane	8010	<0.5	ug/L	06/14/1993
Methylene chloride	8010	<10	ug/L	06/14/1993
Trichlorofluoromethane	8010	<0.5	ug/L	06/14/1993
1,1-Dichloroethene	8010	<0.5	ug/L	06/14/1993
1,1-Dichloroethane	8010	<0.5	ug/L	06/14/1993
trans-1,2-Dichloroethene	8010	<0.5	ug/L	06/14/1993
cis-1,2-Dichloroethene	8010	<0.5	ug/L	06/14/1993
Chloroform	8010	<0.5	ug/L	06/14/1993
1,2-Dichloroethane	8010	<0.5	ug/L	06/14/1993
1,1,1-Trichloroethane	8010	<0.5	ug/L	06/14/1993
Carbon Tetrachloride	8010	<0.5	ug/L	06/14/1993
Bromodichloromethane	8010	<0.5	ug/L	06/14/1993
1,2-Dichloropropane	8010	<0.5	ug/L	06/14/1993
trans-1,3-Dichloropropene	8010	<0.5	ug/L	06/14/1993
Trichloroethene	8010	<0.5	ug/L	06/14/1993
Dibromochloromethane	8010	<0.5	ug/L	06/14/1993
1,1,2-Trichloroethane	8010	<0.5	ug/L	06/14/1993
cis-1,3-Dichloropropene	8010	<0.5	ug/L	06/14/1993
2-Chloroethylvinyl ether	8010	<1.0	ug/L	06/14/1993
Bromoform	8010	<0.5	ug/L	06/14/1993
1,1,2,2-Tetrachloroethane	8010	<0.5	ug/L	06/14/1993
Tetrachloroethene	8010	<0.5	ug/L	06/14/1993
Chlorobenzene	8010	<0.5	ug/L	06/14/1993
1,3-Dichlorobenzene	8010	<0.5	ug/L	06/14/1993
1,2-Dichlorobenzene	8010	<0.5	ug/L	06/14/1993
1,4-Dichlorobenzene	8010	<0.5	ug/L	06/14/1993

ANALYTICAL REPORT

Tim O'Gara
Brown and Caldwell
Suite 200
9620 S.W. Barbur Blvd.
Portland, OR 97219

06/18/1993
Job No.: 93.00559

Project Name: James River DW
Date Received: 06/11/1993

Sample Number	Sample Description
16561	DW-3

PARAMETERS	METHODS	RESULTS		DATE ANALYZED
8010 HALOGENATED VOC (W)				
Dilution Factor		1		06/15/1993
Chloromethane	8010	<0.5	ug/L	06/15/1993
Bromomethane	8010	<0.5	ug/L	06/15/1993
Vinyl chloride	8010	<2.0	ug/L	06/15/1993
Chloroethane	8010	<0.5	ug/L	06/15/1993
Methylene chloride	8010	<10	ug/L	06/15/1993
Trichlorofluoromethane	8010	<0.5	ug/L	06/15/1993
1,1-Dichloroethene	8010	<0.5	ug/L	06/15/1993
1,1-Dichloroethane	8010	<0.5	ug/L	06/15/1993
trans-1,2-Dichloroethene	8010	<0.5	ug/L	06/15/1993
cis-1,2-Dichloroethene	8010	<0.5	ug/L	06/15/1993
Chloroform	8010	<0.5	ug/L	06/15/1993
1,2-Dichloroethane	8010	<0.5	ug/L	06/15/1993
1,1,1-Trichloroethane	8010	1.9	ug/L	06/15/1993
Carbon Tetrachloride	8010	<0.5	ug/L	06/15/1993
Bromodichloromethane	8010	<0.5	ug/L	06/15/1993
1,2-Dichloropropane	8010	<0.5	ug/L	06/15/1993
trans-1,3-Dichloropropene	8010	<0.5	ug/L	06/15/1993
Trichloroethene	8010	4.1	ug/L	06/15/1993
Dibromochloromethane	8010	<0.5	ug/L	06/15/1993
1,1,2-Trichloroethane	8010	<0.5	ug/L	06/15/1993
cis-1,3-Dichloropropene	8010	<0.5	ug/L	06/15/1993
2-Chloroethylvinyl ether	8010	<1.0	ug/L	06/15/1993
Bromoform	8010	<0.5	ug/L	06/15/1993
1,1,2,2-Tetrachloroethane	8010	<0.5	ug/L	06/15/1993
Tetrachloroethene	8010	8.8	ug/L	06/15/1993
Chlorobenzene	8010	<0.5	ug/L	06/15/1993
1,3-Dichlorobenzene	8010	<0.5	ug/L	06/15/1993
1,2-Dichlorobenzene	8010	<0.5	ug/L	06/15/1993
1,4-Dichlorobenzene	8010	<0.5	ug/L	06/15/1993

ANALYTICAL REPORT

Tim O'Gara
Brown and Caldwell
Suite 200
9620 S.W. Barbur Blvd.
Portland, OR 97219

06/18/1993
Job No.: 93.00559

Project Name: James River DW
Date Received: 06/11/1993

Sample Number	Sample Description
16562	DW-2

PARAMETERS	METHODS	RESULTS		DATE ANALYZED
8010 HALOGENATED VOC (W)				
Dilution Factor		1		06/15/1993
Chloromethane	8010	<0.5	ug/L	06/15/1993
Bromomethane	8010	<0.5	ug/L	06/15/1993
Vinyl chloride	8010	<2.0	ug/L	06/15/1993
Chloroethane	8010	<0.5	ug/L	06/15/1993
Methylene chloride	8010	<10	ug/L	06/15/1993
Trichlorofluoromethane	8010	<0.5	ug/L	06/15/1993
1,1-Dichloroethene	8010	<0.5	ug/L	06/15/1993
1,1-Dichloroethane	8010	<0.5	ug/L	06/15/1993
trans-1,2-Dichloroethene	8010	<0.5	ug/L	06/15/1993
cis-1,2-Dichloroethene	8010	<0.5	ug/L	06/15/1993
Chloroform	8010	<0.5	ug/L	06/15/1993
1,2-Dichloroethane	8010	<0.5	ug/L	06/15/1993
1,1,1-Trichloroethane	8010	2.0	ug/L	06/15/1993
Carbon Tetrachloride	8010	<0.5	ug/L	06/15/1993
Bromodichloromethane	8010	<0.5	ug/L	06/15/1993
1,2-Dichloropropane	8010	<0.5	ug/L	06/15/1993
trans-1,3-Dichloropropene	8010	<0.5	ug/L	06/15/1993
Trichloroethene	8010	9.2	ug/L	06/15/1993
Dibromochloromethane	8010	<0.5	ug/L	06/15/1993
1,1,2-Trichloroethane	8010	<0.5	ug/L	06/15/1993
cis-1,3-Dichloropropene	8010	<0.5	ug/L	06/15/1993
2-Chloroethylvinyl ether	8010	<1.0	ug/L	06/15/1993
Bromoform	8010	<0.5	ug/L	06/15/1993
1,1,2,2-Tetrachloroethane	8010	<0.5	ug/L	06/15/1993
Tetrachloroethene	8010	9.3	ug/L	06/15/1993
Chlorobenzene	8010	<0.5	ug/L	06/15/1993
1,3-Dichlorobenzene	8010	<0.5	ug/L	06/15/1993
1,2-Dichlorobenzene	8010	<0.5	ug/L	06/15/1993
1,4-Dichlorobenzene	8010	<0.5	ug/L	06/15/1993

ANALYTICAL REPORT

Tim O'Gara
Brown and Caldwell
Suite 200
9620 S.W. Barbur Blvd.
Portland, OR 97219

06/18/1993
Job No.: 93.00559

Project Name: James River DW
Date Received: 06/11/1993

Sample Number	Sample Description
16563	DW-1

PARAMETERS	METHODS	RESULTS		DATE ANALYZED
8010 HALOGENATED VOC (W)				
Dilution Factor		1		06/15/1993
Chloromethane	8010	<0.5	ug/L	06/15/1993
Bromomethane	8010	<0.5	ug/L	06/15/1993
Vinyl chloride	8010	<2.0	ug/L	06/15/1993
Chloroethane	8010	<0.5	ug/L	06/15/1993
Methylene chloride	8010	<10	ug/L	06/15/1993
Trichlorofluoromethane	8010	<0.5	ug/L	06/15/1993
1,1-Dichloroethene	8010	<0.5	ug/L	06/15/1993
1,1-Dichloroethane	8010	<0.5	ug/L	06/15/1993
trans-1,2-Dichloroethene	8010	<0.5	ug/L	06/15/1993
cis-1,2-Dichloroethene	8010	<0.5	ug/L	06/15/1993
Chloroform	8010	<0.5	ug/L	06/15/1993
1,2-Dichloroethane	8010	<0.5	ug/L	06/15/1993
1,1,1-Trichloroethane	8010	2.0	ug/L	06/15/1993
Carbon Tetrachloride	8010	<0.5	ug/L	06/15/1993
Bromodichloromethane	8010	<0.5	ug/L	06/15/1993
1,2-Dichloropropane	8010	<0.5	ug/L	06/15/1993
trans-1,3-Dichloropropene	8010	<0.5	ug/L	06/15/1993
Trichloroethene	8010	11.4	ug/L	06/15/1993
Dibromochloromethane	8010	<0.5	ug/L	06/15/1993
1,1,2-Trichloroethane	8010	<0.5	ug/L	06/15/1993
cis-1,3-Dichloropropene	8010	<0.5	ug/L	06/15/1993
2-Chloroethylvinyl ether	8010	<1.0	ug/L	06/15/1993
Bromoform	8010	<0.5	ug/L	06/15/1993
1,1,2,2-Tetrachloroethane	8010	<0.5	ug/L	06/15/1993
Tetrachloroethene	8010	7.0	ug/L	06/15/1993
Chlorobenzene	8010	<0.5	ug/L	06/15/1993
1,3-Dichlorobenzene	8010	<0.5	ug/L	06/15/1993
1,2-Dichlorobenzene	8010	<0.5	ug/L	06/15/1993
1,4-Dichlorobenzene	8010	<0.5	ug/L	06/15/1993

NORTH PORTLAND HARBOR

3400 N. MARINE DRIVE

PARKING

PARKING

DW-3

DW-2

DW-1

No. 19

No. 7

No. 6

No. 8

No. 5

No. 2

No. 1

No. 4
No. 3

No. 21

No. 17

No. 15

No. 10

No. 18

No. 13

No. 12

No. 11

No. 14

No. 9

No. 16

No. 20

JRC PROPERTY LINE

JRC PROPERTY LINE

DW-3	5/91	6/93
TCA	<2.0	1.9
TCE	<2.0	4.1
PCE	6.1	8.8

DW-2	5/91	6/93
TCA	<2.0	2.0
TCE	2.3	9.2
PCE	7.4	9.3

DW-1	5/91	6/93
TCA	<2.0	2.0
TCE	8.7	11.4
PCE	3.7	7.0

100 0 100 200

APPROXIMATE SCALE
IN FEET

EXPLANATION

DW-1 ⊙ Approximate Location of Deep Groundwater Monitoring Well

TCA 1,1,1 – Trichloroethane, in parts per billion (ppb)

TCE Trichloroethene, in ppb

PCE Tetrachloroethene, in ppb

Brown and Caldwell Consultants

7705FIG4 07-01-93

FIGURE 4
DEEP MONITORING WELL ANALYTICAL RESULTS SUMMARY
JAMES RIVER CORPORATION

indicates that a central cone of depression is centered around the three production wells at the site and that deep groundwater flows into the site from the west, east, and south.

Analytical results of groundwater samples collected during this sampling event are summarized in Table 1. The complete laboratory report and chain-of-custody document for this sampling event are included in Appendix C. A summary of analytical data to-date is included in Figure 4 and Appendix D.

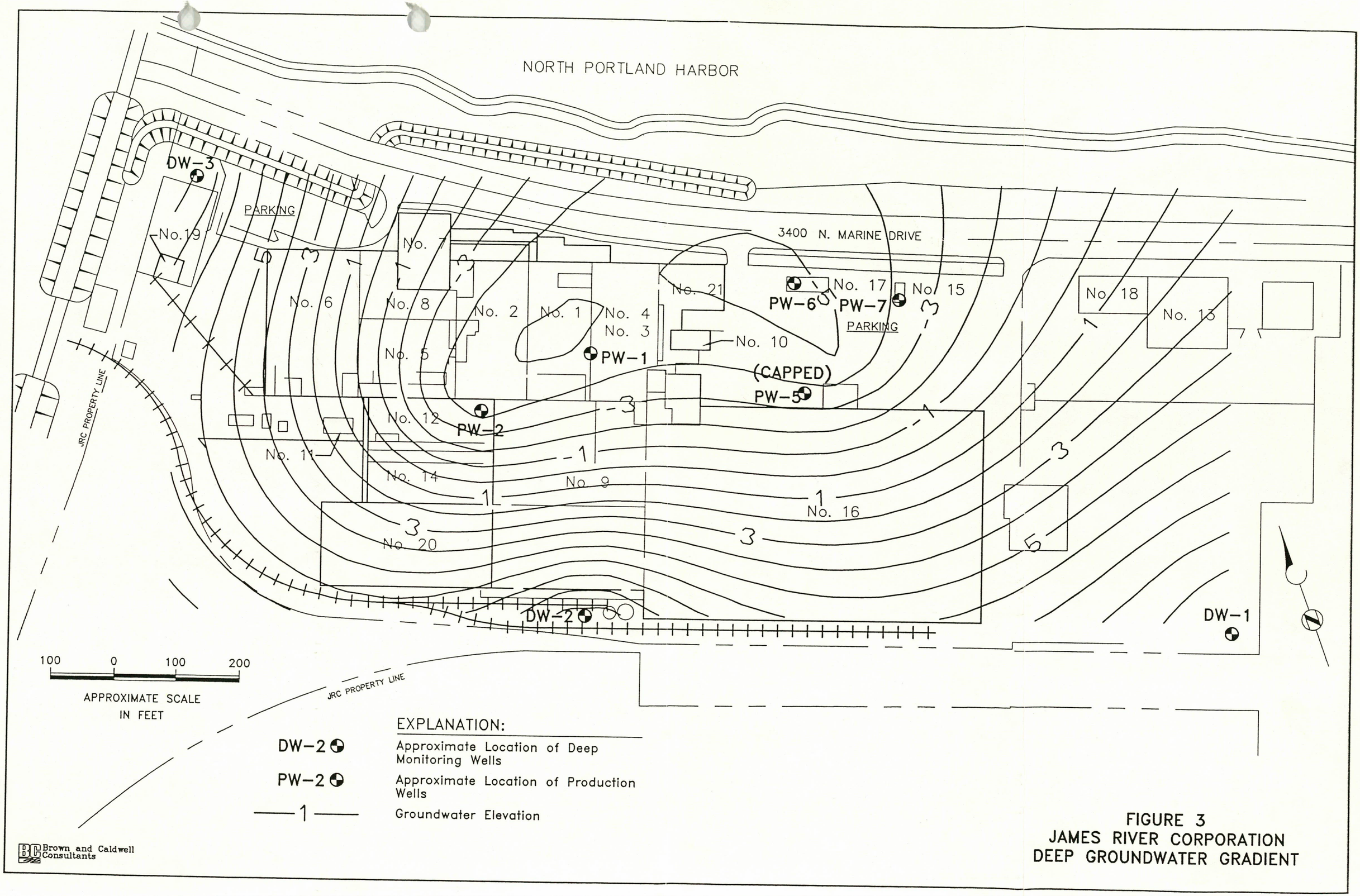
Table 1. Deep Groundwater Monitoring Analytical Results
James River Corporation
June 11, 1993

	Halogenated Volatile Organic Compound Analysis[a]		
Sample Location	1,1,1-Trichloroethane (TCA)	Trichloroethene (TCE)	Tetrachloroethane (PCE)
DW-1	2.0	11.4	7.0
DW-1D[b]	2.2	11.2	6.3
DW-2	2.0	9.2	9.3
DW-3	1.9	4.1	8.8
FB[c]	<0.5	<0.5	<0.5
DEQ MCLs[d]	200	5.0	5.0

[a] Analysis by EPA Method 8010, concentrations in parts per billion (ppb).
[b] Duplicate sample of DW-1.
[c] QA\QC field blank.
[d] DEQ maximum contaminant levels, concentrations in ppb.

DISCUSSION AND CONCLUSIONS

Low levels of trichloroethene (TCE), 1,1,1-trichloroethane (TCA), and tetrachloroethane (PCE) were detected in all three of the deep groundwater wells sampled. Samples collected from DW-1 and DW-2 exceeded the DEQ maximum contaminant levels (MCLs) for PCE and TCE of 5.0 ppb. Samples collected from DW-3 exceeded the DEQ MCL for PCE. VOC levels have increased slightly from the previous deep groundwater investigation conducted during the installation of the wells in April 1991 (Appendix D).



7705FIG3 07-13-93

Brown and Caldwell Consultants

FIGURE 3
JAMES RIVER CORPORATION
DEEP GROUNDWATER GRADIENT

The site and immediate vicinity are relatively flat and gently slope towards the south. The Columbia River and North Portland Harbor are within 200 feet north of the site. Several small lakes, wetland areas, and the Columbia River Slough are within a mile to the southeast and southwest of the site.

The JRC facility is situated in a heavily industrialized area with no nearby residential activity. The facility is bordered to the north by the North Portland Harbor, and to the south by an undeveloped wetland and golf course. A mainline of the Burlington Northern Railroad lies adjacent to the western site perimeter while the Portland Union Stockyard is situated beyond the site's eastern boundary.

The site is situated in Section 38, Township 2 North, Range 1 East, Willamette Baseline and Meridian, at 122° 41′ 50.7″ West longitude and 45° 36′ 38.7″ North latitude (USGS 1961).

PREVIOUS INVESTIGATIONS

Previous investigations and remedial activities at the CPD have included the decommissioning of six underground storage tanks (USTs), follow-up soil and groundwater investigations and two years of quarterly monitoring of the shallow groundwater.

CPD Tank Decommissioning - April 1989

In April 1989 five alcohol-solvent USTs were excavated from the Press Room UST area and one gasoline UST was excavated from the Gasoline UST area of the CPD (Figure 2). Laboratory analysis of soil samples collected from the Press Room UST excavation revealed elevated concentrations of methanol, ethanol, normal propanol, isopropanol, butanol, hexanol, acetone, toluene, methyl isobutyl ketone (MIBK), and ethyl acetate. Analysis of soil and groundwater samples collected from the Gasoline UST excavation indicated the presence of benzene, toluene, ethylbenzene, and xylene (BTEX). A detailed summary of this investigation is included in our November 28, 1989 report.

Contaminated soils that were removed from each excavation were placed in separate piles and allowed to aerate until October 1989. Subsequent laboratory analysis of soil samples from each aeration pile confirmed the effectiveness of aeration, and upon approval by the Oregon Department of Environmental Quality (DEQ), the soils were used to backfill the respective UST excavations.

Follow-Up CPD Soil and Groundwater Investigation - September 1989

In response to the soil and groundwater contamination documented during CPD tank decommissioning procedures, BCC conducted a follow-up soil and groundwater investigation in the areas surrounding the former Press Room and Gasoline UST excavations. The investigation included a soil vapor survey, installation of six groundwater monitoring wells, soil and groundwater sampling and analysis, and measurement of groundwater elevations to determine the shallow groundwater gradient. A detailed discussion of this investigation is included in our November 28, 1989, report.

Press Room UST Area. Based on the results of the soil vapor survey, groundwater monitoring wells JR-1, JR-2 and JR-3 were installed near the former Press Room UST excavation (Figure 2). JR-1 and JR-3 were completed at a depth of 25 feet below grade (bg) and screened from 10 to 25 feet bg; JR-2 was completed at a depth of 23 feet bg and screened from 8 to 23 feet bg.

Laboratory analysis of soil samples collected during the construction of these wells detected toluene concentrations between 0.2 ppm and 0.3 ppm in samples collected at 2 feet bg from JR-1 and JR-3, and 10 feet bg from JR-2. The JR-2 sample also contained isopropyl alcohol, acetone, MIBK, and methyl ethyl ketone (MEK) at concentrations of 1,333 ppm, 14 ppm, 9 ppm, and 1 ppm, respectively.

Laboratory analysis of groundwater samples collected from JR-1, JR-2, and JR-3, revealed elevated concentrations of isopropyl alcohol (7,800 ppb), acetone (1,500 ppb), and MIBK (440 ppb) in JR-2. No compounds were identified above laboratory method detection limits (MDL) in groundwater samples from JR-1 and JR-3.

Gasoline UST Area. Groundwater monitoring wells JR-4, JR-5 and JR-6 were installed near the former gasoline UST excavation. Each of these wells were completed at a depth of 20 feet bg and screened from 5 to 15 feet bg.

Laboratory analysis of soil samples collected during the construction of these wells detected TPH concentrations of 140 ppm and 360 ppm in samples collected at 2 feet bg from JR-5 and JR-6, respectively. Samples collected from JR-4, JR-5 and JR-6 at 5 feet bg had lower TPH concentrations of 17 ppm, 100 ppm and 17 ppm, respectively. The hydrocarbon identification (HCID) analysis, performed on samples from JR-5 and JR-6 did not indicate the presence of hydrocarbons within a carbon range of C_6 - C_{25}.

Laboratory analysis of groundwater samples collected from JR-4, JR-5, and JR-6, revealed elevated concentrations of benzene (120 ppb), ethylbenzene (14 ppb), and xylene (960 ppb) in JR-5. No BTEX constituents were identified above laboratory MDLs in groundwater samples from JR-4 and JR-6.

Deep Groundwater Monitoring Investigation - April 1991

An additional soil and groundwater investigation was performed between March 19 and April 22, 1991, to assess the nature, extent, magnitude, and potential impact of volatile organic contamination in the deep groundwater beneath the JRC facility. Three boreholes were drilled to approximately 160 feet below ground surface. Monitoring wells (DW-1, DW-2, and DW-3) were installed and screened from 130 feet to 160 feet bg in each of the three boreholes. Groundwater samples were collected after the monitoring wells were installed.

Laboratory analysis of the soil samples collected from the boreholes indicated that toluene detected at 5.5 ppb in DW-2 at 20 feet bg, was the only volatile organic compound identified. A summary of the results of deep groundwater monitoring investigation can be found in our November 18, 1992, report.

Analytical results from the groundwater samples collected identified tetrachloroethene (PCE) in samples from DW-1, DW-2, and DW-3 at concentrations ranging from 3.7 ppb in DW-1 and 6.1 ppb in DW-3. Trichlorethene (TCE) was identified in samples from DW-1 and DW-2 at 8.7 ppb and 2.5 ppb, respectively.

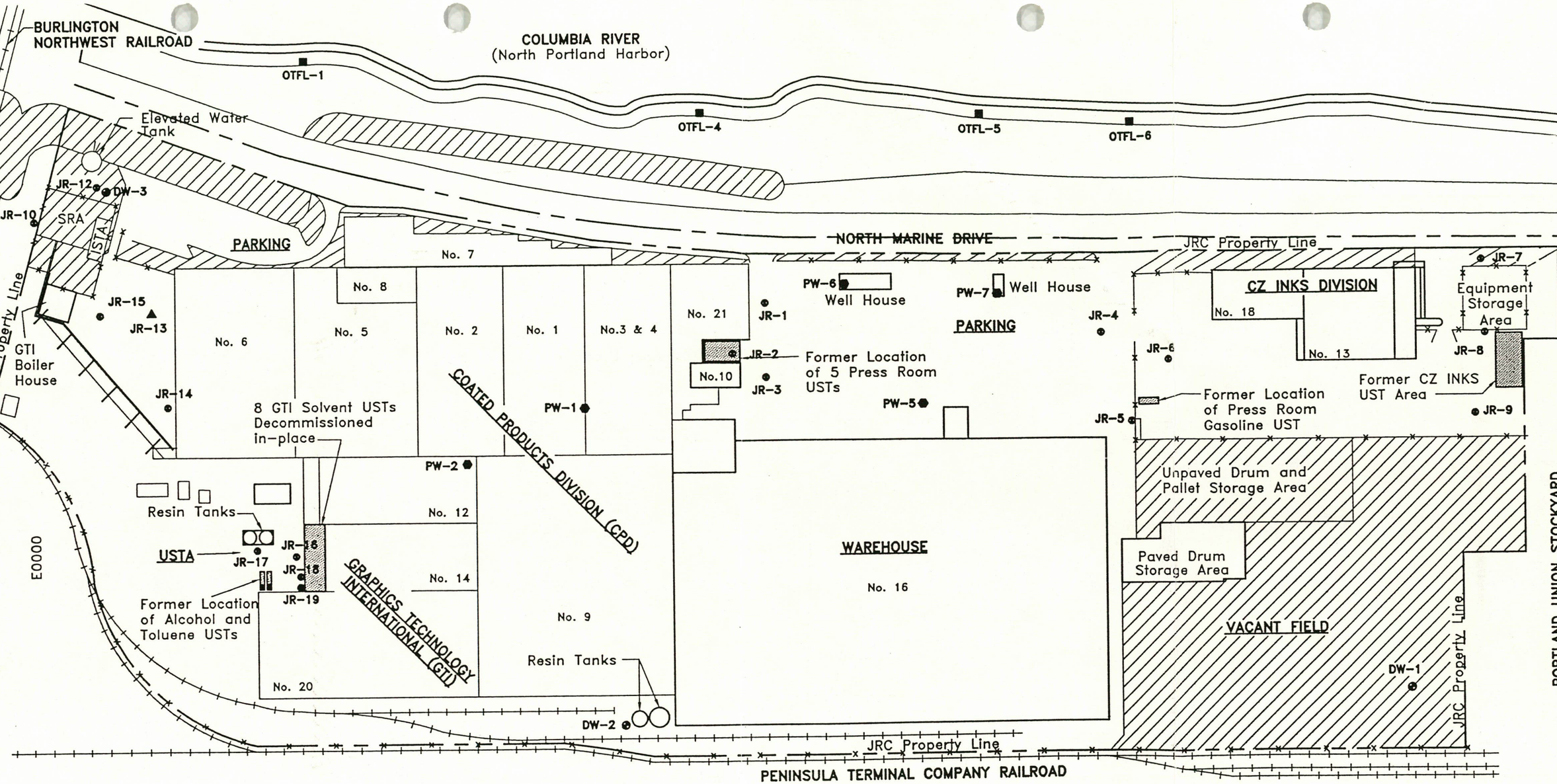
PROCEDURES - GROUNDWATER MONITORING

The field activities included purging and sampling of groundwater from monitoring wells DW-1, DW-2, and DW-3 on June 11, 1993. A complete description of Brown and Caldwell's field procedures can be found in Appendix A.

Static water level (SWL) measurements were recorded prior to purging and sampling, and groundwater elevations for each well were calculated. Groundwater elevation data for the current monitoring event is summarized in Appendix B. Refer to Figure 3 for monitoring well locations and the current groundwater gradient. Samples were analyzed for halogenated volatile organic compounds by EPA Method 8010.

RESULTS

Figure 3 depicts deep groundwater flow under the JRC facility. In order to evaluate possible aquifer response to pumping in the deep aquifer, water levels were collected from the three deep groundwater wells and correlated with the estimated drawdown levels from the water supply wells in the plant. The estimated drawdown model



EXPLANATION

- Former Location of Underground Ethyl Alcohol Distribution Line
- Fence
- Above Ground Solvent Laden Duct (SLD)
- Unpaved Areas
- No. 5 — Building Number
- ISTA — Intermediate Storage Tank Area
- SRA — Solvent Recovery Area
- USTA — Underground Storage Tank Area
- DW-1 — Approximate Location of Deep Monitoring Wells
- JR-6 — Approximate Location of Shallow Monitoring Wells
- JR-19 — Approximate Location of Vapor Extraction Well
- PW-5 — Approximate Location of Production Wells
- JR-13 — Approximate Location of Soil Boring
- OTFL-5 — Approximate Location of Outfall Manholes

0 100 200

Approximate Scale in Feet

FIGURE 2
SITE MAP
JAMES RIVER CORPORATION

Brown and Caldwell
9620 S.W Barbur Boulevard
Suite 200
Portland, OR 97219-6041
(503) 244-7005
FAX (503) 244-9095

December 27, 1993

Mr. David Ernst
Site Maintenance and Environmental Manager
James River Corporation
3400 North Marine Drive
Portland, Oregon 97217

13-7705

Subject: June 1993, Semi-Annual, Deep Groundwater Monitoring Results
James River Corporation, North Portland Facility

Dear Mr. Ernst:

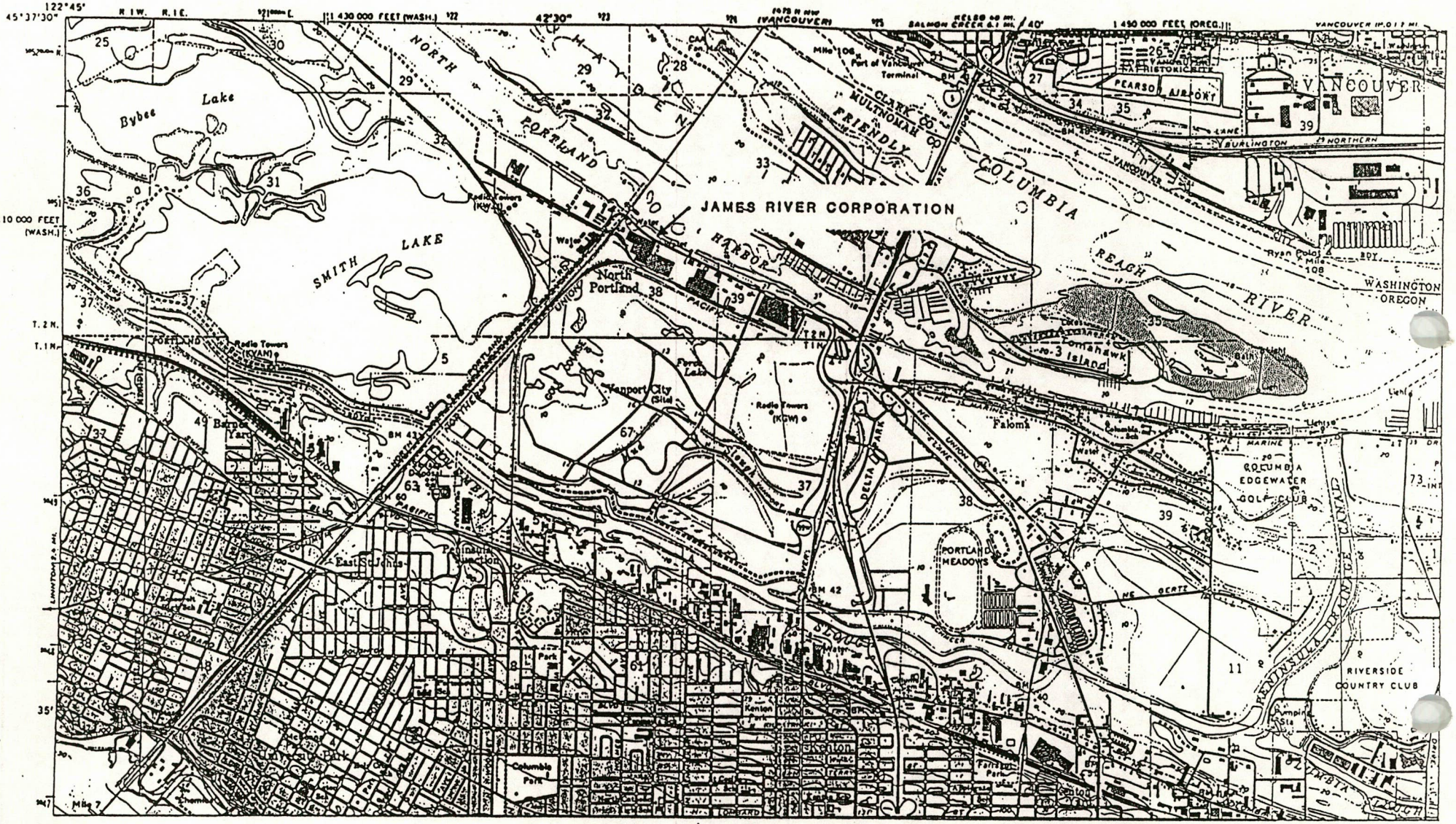
This letter report presents the analytical results of the June 1993, semi-annual deep groundwater monitoring performed by Brown and Caldwell Consultants (BCC) at James River Corporation (JRC), North Portland facility. The JRC North Portland facility is located at 3400 North Marine Drive in Portland, Oregon (Figure 1). This investigation followed the scope of work presented in our March 4, 1993, letter and cost estimate and is covered by JRC purchase order No.93101419.

BACKGROUND

James River Corporation is a major integrated manufacturer of paper, film, and plastic products serving the hygienics, communications, food and consumer packaging, food and beverage service, and specialty industrial packaging markets. The North Portland, Oregon, facility is specifically involved in design and application of flexible packaging for various clients.

A 530,000-square-foot manufacturing complex houses Graphics Technology International, Inc. (GTI), the JRC's Coated Products Division (CPD), and a large warehouse. A smaller, 30,000-square-foot building complex occupying the northeast corner of the property accommodates JRC's CZ-Inks Division (CZD). Other prominent features on site include the GTI Solvent Recovery area in the northwest corner; the GTI aboveground Solvent Laden Duct (SLD), which extends from the southeast corner of building No. 6 to the boiler house; and a paved, outdoor drum storage area immediately east of the warehouse (Figure 2).

Approximately 56 percent (389,000 square feet) of the area surrounding the main building complexes consists of asphalt parking areas, driveways, and storage areas. The remaining 44 percent (305,000 square feet) is unpaved and covered with grass, shrubbery, or gravel. A vacant grass field of roughly 177,500 square feet covers the southeast corner of the site and accounts for the majority of the unpaved site area.



JAMES RIVER CORPORATION

VICINITY SITE MAP

FIGURE 1

JAMES RIVER CORPORATION
SEMI-ANNUAL, DEEP GROUNDWATER MONITORING RESULTS
NORTH PORTLAND FACILITY

December 1993

the proposed investigation and cleanup plans, for the gasoline tank area, as we had originally planned in April, 1994, please call me at (503) 229-5474.

Sincerely,

Andree Pollock
UST Cleanup Specialist

cc: Gil Wistar, NWR-VCSAS

SECOR
P.O. Box 1508
Tualatin, Oregon 97062-1508

State of Oregon
Department of Environmental Quality — Memorandum

Date: March 7, 1995

To: Andree Pollock, NWR/UST

From: Gil Wistar, NWR/VCSAS

Subject: James River Flexible Packaging Div., file #26-89-064

cc: Mike Rosen

Andree, yesterday you requested that I evaluate whether the "press room" underground tank storage (UST) area at this site could be addressed under the UST Section's oversight, along with the gasoline UST on a different part of the site. It is my view that this would **not** be appropriate, for the reasons outlined below.

* Based on a 1986 James River inventory, the USTs beneath the press room area contained, as the *current or last stored substance*, a variety of alcohols and petroleum distillates. These are not fuels, and because the tanks had been in use since 1960, they could have contained substances other than those listed in the 1986 inventory.

* Subsequent to the 1989 removal of these USTs and 150 yards of contaminated soil from the tank pit, chlorinated solvents were detected in soil gas and soil borings in the press room area. Boring results show PCE levels above Oregon Soil Cleanup Standards in shallow soil in this area. Although SEACOR states that the VOCs *may not be* from the former USTs, it is also possible that they did originate from the tanks. Regardless of these contaminants' source(s), this discovery requires further evaluation.

* Monitoring well JR-2, located in the center of the former press room USTs, contained high concentrations of isopropanol, ethanol, acetone, and MIBK, for seven consecutive sampling rounds (between 9/89 and 8/91). Because of the solubility of these compounds and their high initial concentrations, their apparently sudden disappearance could have resulted from groundwater dilution or plume migration. Further evaluation is needed to determine what in fact has happened to these compounds.

Should James River wish to obtain a "no further action" determination for the press room area and other contaminated portions of the site not related to fuel USTs, participation in the Voluntary Cleanup Program would be necessary.

JAMES RIVER CORPORATION
3400 N. Marine Dr., Portland, OR 97217-7746 503-286-1621
Mailing Address: P.O. Box 17128, Portland, OR 97217-0128

March 25, 1994

Mr. Andre Paullick
Oregon Department of Environmental Quality - Northwest Region
2020 SW 4th, Suite 400
Portland, Oregon 97201

Dear Mr. Paullick:

REFERENCE: UST Closure & Remediation Meeting

Enclosed under this cover are copies of reports related to both shallow and deep groundwater monitorings conducted at the James River Flexible Packaging Plant Site since the last report you have in your file. I understand that oversight of our two areas has been transferred to you as part of the DEQ reorganization. The enclosed information should assist you in becoming familiar with what work has been completed to help James River to bring the two sites to closure. I look forward to meeting you at our scheduled meeting of April 12, 1994, at 9:30 AM at our plant site.

If you have any questions concerning the enclosed information, please feel free to call me.

Sincerely,

JAMES RIVER CORPORATION

David Ernst
Environmental Manager

Attachments:

1. Semi-Annual Deep Groundwater Monitoring Results - December 1993
2. Corrective Action Plan - July 15, 1993
3. Proposal for Additional Soil and Groundwater Assessment - October 1, 1993

/de

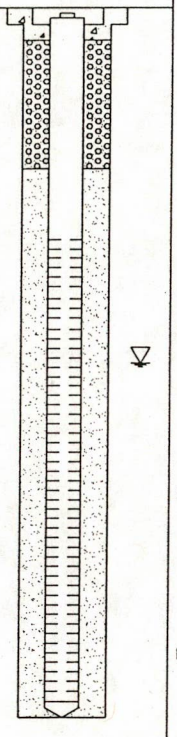
c: Dave Moser - N.P. Gigi Cutler - CES - Camas File

Logged By: S. Webb | Started: 1031 4/24/95 | Surface Elevation: N/A

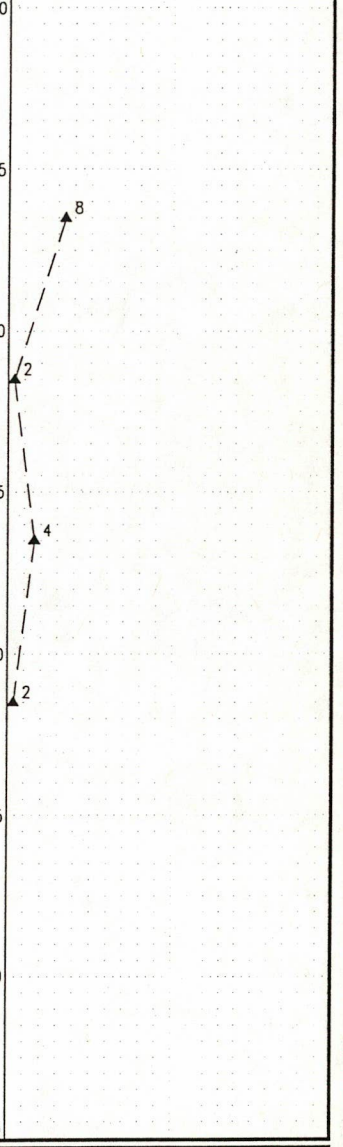
Sample Method: Split-Spoon Sampler | Finished: 1100 4/24/95 | Top of Casing Elevation: N/A

Subcontractor: Geotech Explorations, Inc. | Equipment: CME 55 HSA | Monitoring Device: OVM 580 B

Comments: Hand augered first five feet.



Sheen	Head Space Field Screen (ppm)	Depth in feet	Lithologic Description	Unified Soil Classification	Time Sampled	Sample
		0	ASPHALT (~2" thick) SAND; medium grained; poorly graded; brown; damp; loose.	SP		
NS	1	5	– becomes moist			
NS	0	10	Clayey SILT with trace fine sand; dark gray; wet; very soft; non-plastic.	ML		
NS	0	15	– grades to: Fine sandy SILT with trace clay; dark gray; wet; very soft; non-plastic.			
NS	0	20	– grades to: Silty fine SAND; dark gray; wet; very loose; poorly graded.	SM		
		22	Boring terminated at 22' below ground surface.			



■ Field Screen / Lithologic Description Sample
⊠ Lab Sample
□ No Recovery
▲N N-Value in Blows/Foot

▽ Groundwater Level at Time of Drilling
▼ Static Groundwater Level
NS No Sheen
SS Slight Sheen

MS Moderate Sheen
HS Heavy Sheen
ND None Detected
ppm Parts Per Million

Concrete
Grout Annular Seal
10/20 Colorado Silica Sand

2" id PVC Blank Casing
2" id PVC Screen (0.010 slots)
End Cap

SECOR
INTERNATIONAL
INCORPORATED
TUALATIN, OREGON

JAMES RIVER CORPORATION
3400 N. MARINE DRIVE
PORTLAND, OREGON

WELL LOG JR-7

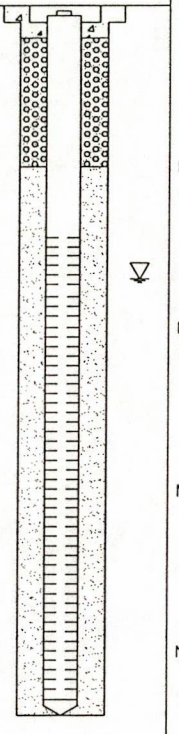
JOB: F0075-001-04 DRAWN: KPW DATE: 5/3/95 APPROVED: GJN DATE: 5-18-95

Logged By: S. Webb | Started: 1330 4/24/95 | Surface Elevation: N/A

Sample Method: Split-Spoon Sampler | Finished: 1410 4/24/95 | Top of Casing Elevation: N/A

Subcontractor: Geotech Explorations, Inc. | Equipment: CME 55 HSA | Monitoring Device: OVM 580 B

Comments: Hand augered first five feet. Had to redrill do to heaving sands.



Sheen	Head Space Field Screen (ppm)	Depth in feet	Lithologic Description	Unified Soil Classification	Time Sampled	Sample	Depth in Feet	Standard Penetration Resistance (140 lb. Weight, 30" Drop)
		0	ASPHALT (~3" thick)				0	
			SAND with trace silt; medium grained; poorly graded; brown; moist; loose.	SP				
NS	0	5					5	8
		10	Silty fine SAND with trace clay; poorly graded; dark gray; wet; very loose.	SM			10	3
			Clayey SILT with some fine sand; dark gray; wet; soft; non-plastic.	ML				
NS	0	15					15	4
			Silty fine SAND with trace clay; poorly graded; dark gray; wet; very loose.	SM				
			Clayey SILT with trace fine sand; dark gray; wet; soft; non-plastic.	ML				
			Silty fine SAND; poorly graded; gray; wet; very loose.	SM				
NS	0	20					20	4
			Boring terminated at 22' below ground surface.					
		25					25	
		30					30	
		35					35	

Standard Penetration Resistance (140 lb. Weight, 30" Drop): 0 25 50

■ Field Screen / Lithologic Description Sample
⊠ Lab Sample
□ No Recovery
▲N N-Value in Blows/Foot

▽ Groundwater Level at Time of Drilling
▼ Static Groundwater Level
NS No Sheen
SS Slight Sheen

MS Moderate Sheen
HS Heavy Sheen
ND None Detected
ppm Parts Per Million

Concrete
Grout Annular Seal
10/20 Colorado Silica Sand

2" id PVC Blank Casing
2" id PVC Screen (0.010 slots)
End Cap

SECOR
INTERNATIONAL
INCORPORATED
TUALATIN, OREGON

JAMES RIVER CORPORATION
3400 N. MARINE DRIVE
PORTLAND, OREGON

WELL LOG JR-8

JOB: F0075-001-04 DRAWN: KPW DATE: 5/3/95 APPROVED: GBN DATE: 5-18-95

ATTACHMENT 2
GROUNDWATER FIELD SAMPLING DATA SHEETS

Additional Groundwater Assessment Activities Report
Gasoline UST Area
James River Corporation, Portland, Oregon
SECOR PN: F0075-001-04
May 17, 1995

SEACOR

GROUNDWATER SAMPLING FIELD DATA SHEET

SEACOR PN: F0075-001-04 DATE: 5-1-95 WELL NO. JR-4

FACILITY NAME: JAMES RIVER CORPORATION TEMPERATURE: 60 (F) or °C

FIELD PERSONNEL: CTC WEATHER: RAIN

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 11.61 FT. or IN.

B. Thickness of Free Product, if present: / Inches

C. Total Depth of well (TD) from top of casing/piezometer: 16.00 FT. or IN.

D. Height of Water Column in casing (h = TD - SWL): 4.39 FT. or IN.

E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.			
2" diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water 4.39	=	2.2 PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water ____	=	____ PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water ____	=	____ PV (gallons)

PURGING METHOD: BAILER DURATION: .5 - .75

SERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp. °C	Conduct.	SWL
Volume:	13:00	HEAVY	DK. BRN	NO.	7.53	15.2	2,000	/
Volume:	13:05	↓	↓	↓	7.99	15.1	2,100	
Volume:	13:10				8.10	15.1	2,100	12.0
Volume:								
l. Volumes:								

TOTAL VOLUME OF WATER PURGED FROM WELL: 2.25

PURGE WATER STORED/DISPOSED OF WHERE/HOW: ON SITE DRUM

SAMPLES COLLECTED: Depth to Water at time of sample collection: 11.7

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
JR 4 - 5195	13:30	40ml / 2 VOAs	HCl

COMMENTS:

NEEDS LOCK

Casing Capacities:

2-inch hole.....0.16 gal/lin ft.

4-inch hole.....0.65 gal/lin ft.

6.5-inch hole.....1.70 gal/lin ft.

8-inch hole.....2.60 gal/lin ft.

10-inch hole.....4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: 16.00

Original Water Column: 4.39 x 0.80 = -(3.51)

Collect sample when Depth to Water measures Less than or equal to: 12.49

SEACOR
GROUNDWATER SAMPLING FIELD DATA SHEET

SEACOR PN: F0075-001-04 DATE: 5-1-95 WELL NO. JR-5

FACILITY NAME: JAMES RIVER CORPORATION TEMPERATURE: 60 (F) or °C

FIELD PERSONNEL: CTC WEATHER: RAIN

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 9.40 FT. or IN.
B. Thickness of Free Product, if present: / Inches
C. Total Depth of well (TD) from top of casing/piezometer: 19.75 FT. or IN.
D. Height of Water Column in casing (h = TD - SWL): 10.35 FT. or IN.

E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.				
2" diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water	10.35	=	5.19 PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water		=	PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water		=	PV (gallons)

PURGING METHOD: BAILER DURATION: .5 - .75

SERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp. °C	Conduct.	SWL
t Volume:	13:45	LOW	CLEAR	NO.	8.59	13.1	500	/
d Volume:	13:50	↓	↓	↓	8.5	13.2	450	/
f Volume:	13:55	↓	↓	↓	8.41	13.2	400	10.0
1 Volume:								
dl. Volumes:								

TOTAL VOLUME OF WATER PURGED FROM WELL:
PURGE WATER STORED/DISPOSED OF WHERE/HOW: ON SITE DRUM

SAMPLES COLLECTED: Depth to Water at time of sample collection:

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
JR5-5195	14:05	40ml/2 VOAs	HCl

COMMENTS:
NEEDS LOCK + BENTONITE SWELLING IN WELL

Casing Capacities:
2-inch hole 0.16 gal/lin ft.
4-inch hole 0.65 gal/lin ft.
6.5-inch hole 1.70 gal/lin ft.
8-inch hole 2.60 gal/lin ft.
10-inch hole 4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: 19.75
Original Water Column: 9.40 x 0.80 = 7.52
Collect sample when Depth to Water measures Less than or equal to: 12.23

SEACOR

GROUNDWATER SAMPLING FIELD DATA SHEET

SEACOR PN: F0075-001-04 DATE: 5-1-95 WELL NO. JR-6

FACILITY NAME: JAMES RIVER CORPORATION TEMPERATURE: 60 (F) or °C

FIELD PERSONNEL: CTC WEATHER: RAIN

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 7.92 FT. or IN.

B. Thickness of Free Product, if present: / Inches

C. Total Depth of well (TD) from top of casing/piezometer: 18.7 FT. or IN.

D. Height of Water Column in casing (h = TD - SWL): 10.78 FT. or IN.

E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.			
2" diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water 10.78	=	5.38 PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water ____	=	____ PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water ____	=	____ PV (gallons)

PURGING METHOD: BAILER DURATION: .5 - .75

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp. °C	Conduct.	SWL
1 Volume:	14:15	LOW	CLEAR	NO.	8.14	14.2	500	/
2 Volume:	14:20	"	"	"	8.13	"	700	/
3 Volume:	14:25	"	"	"	8.11	"	710	9.0
4 Volume:								
Addl. Volumes:								

TOTAL VOLUME OF WATER PURGED FROM WELL: 5.5

PURGE WATER STORED/DISPOSED OF WHERE/HOW: ON SITE DRUM

SAMPLES COLLECTED: Depth to Water at time of sample collection: 8.5

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
JR 6 - 5195	14:30	40ml / 2 VOAs	HCl

COMMENTS:

BAILED FROM MONUMENT, STANDING & DRAIN WATER FROM PARKING LOT

WELL NEEDS LOCK

Casing Capacities:

2-inch hole ____ 0.16 gal/lin ft.

4-inch hole ____ 0.65 gal/lin ft.

6-inch hole ____ 1.70 gal/lin ft.

8-inch hole ____ 2.60 gal/lin ft.

10-inch hole ____ 4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: 18.7

Original Water Column: 10.78 x 0.80 = -(8.62)

Collect sample when Depth to Water measures Less than or equal to: 10.08

SEACOR
GROUNDWATER SAMPLING FIELD DATA SHEET

SEACOR PN: F0075-001-04 DATE: 5-1-95 WELL NO. JR-7

FACILITY NAME: JAMES RIVER CORPORATION TEMPERATURE: 60 (F) or °C

FIELD PERSONNEL: CTC WEATHER: RAIN

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 10.75 FT. or IN.
B. Thickness of Free Product, if present: / inches
C. Total Depth of well (TD) from top of casing/piezometer: 22.60 FT. or IN.
D. Height of Water Column in casing (h = TD - SWL): 11.85 FT. or IN.

E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.			
2" diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water 11.85	=	5.93 PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water ____	=	____ PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water ____	=	____ PV (gallons)

PURGING METHOD: BAILER DURATION: .5-.75

SERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp. °C	Conduct.	SWL
: Volume:	14:40	LOW	CLEAR	NO	7.99	14.2	900	/
d Volume:	14:45	"	"	"	8.01	"	900	/
f Volume:	14:50	"	"	"	8.05	"	900	13.0
i Volume:								
dl. Volumes:								

TOTAL VOLUME OF WATER PURGED FROM WELL: 6
PURGE WATER STORED/DISPOSED OF WHERE/HOW: ON SITE DRUM

SAMPLES COLLECTED: Depth to Water at time of sample collection: 11.25

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
JR 7 - 5195	15:00	40ml / 2 VOAs	HCl

COMMENTS: NEEDS LOCK, BAILED STANDING WATER FROM WELL MONUMENT

Casing Capacities:
2-inch hole 0.16 gal/lin ft.
4-inch hole 0.65 gal/lin ft.
6.5-inch hole 1.70 gal/lin ft.
8-inch hole 2.60 gal/lin ft.
10-inch hole 4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: 22.60
Original Water Column: 10.75 x 0.80 = -(4.61)
Collect sample when Depth to Water measures Less than or equal to: 14

SEACOR
GROUNDWATER SAMPLING FIELD DATA SHEET

SEACOR PN: F0075-001-04 DATE: 5-1-95 WELL NO. JR-8

FACILITY NAME: JAMES RIVER CORPORATION TEMPERATURE: 60 °F or °C

FIELD PERSONNEL: CTC WEATHER: RAIN

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 10.92 FT. or IN.
B. Thickness of Free Product, if present: / inches
C. Total Depth of well (TD) from top of casing/piezometer: 22.5 FT. or IN.
D. Height of Water Column in casing (h = TD - SWL): 11.58 FT. or IN.

E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.			
2" diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water 11.58	=	5.79 PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water ____	=	____ PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water ____	=	____ PV (gallons)

PURGING METHOD: BAILER DURATION: 5-7.5

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp. °C	Conduct.	SWL
1st Volume:	1510	HEAVY	BROWN	NO.	8.50	14.4	1,000	/
2nd Volume:	1515	/	/	/	8.54	14.4	/	/
3rd Volume:	1525	V	V	V	8.53	14.5	V	
4th Volume:								
Addl. Volumes:								

TOTAL VOLUME OF WATER PURGED FROM WELL: ____
PURGE WATER STORED/DISPOSED OF WHERE/HOW: ON SITE DRUM

SAMPLES COLLECTED: Depth to Water at time of sample collection: ____

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
JR 8 - 5195	1535	40ml / 2 VOAs	HCl
D - 5195	"	" " "	"

COMMENTS: D= DUPLICATE, NEEDS LOCK, BAILED FROM MONUMENT STANDING
9= DRAIN WATER FROM PARKING LOT.

Casing Capacities:
2-inch hole 0.16 gal/lin ft.
4-inch hole 0.65 gal/lin ft.
6.5-inch hole 1.70 gal/lin ft.
8-inch hole 2.60 gal/lin ft.
10-inch hole 4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: 22.5
Original Water Column: 11.58 x 0.80 = -(9.26)
Collect sample when Depth to Water measures
Less than or equal to: 13.24

ATTACHMENT 3
LABORATORY DATA REPORT

Additional Groundwater Assessment Activities Report
Gasoline UST Area
James River Corporation, Portland, Oregon
SECOR PN: F0075-001-04
May 17, 1995

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-9508 (206) 481-9200 • FAX 485-2992
East 11115 Montgomery, Suite B • Spokane, WA 99206-4776 (509) 924-9200 • FAX 924-9290
9405 S.W. Nimbus Avenue • Beaverton, OR 97008-7132 (503) 643-9200 • FAX 644-2202

RECEIVED
MAY 1 0 1995

May 8, 1995

SECOR
P.O. Box 1508
Tualatin, OR 97062

Attention: Joe Hunt

RE: JOB # F0075-001-04
P.O.#
PROJECT - JAMES RIVER CORPORATION

Enclosed are test results for your samples received in this lab on May. 02, 1995. For your reference, these analyses have been assigned our NCA # P505022.

Solid samples are reported on a dry weight basis except for Oregon DEQ Fuels Methods and where otherwise noted.

This report will be accompanied by a separate Quality Control Data Report, unless omitted by client request.

Please call if you have any questions.

Respectfully,

Philip Nerenberg
Laboratory Manager

NORTH CREEK ANALYTICAL

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BTEX per EPA 8020
Results In ug/L (ppb)

Client: SECOR
Project: JAMES RIVER CORPORATION

NCA Project #: P505022
Matrix: water
Sampled: 05/01/95
Received: 05/02/95

Client ID	Lab ID	Analyte	Results	MRL	Date Prepared	Date Analyzed
JR-4-5195	P505022-1	Benzene	ND	0.50	05/03/95	05/03/95
		Toluene	ND	0.50		
		Ethylbenzene	ND	0.50		
		Xylenes (total)	ND	0.50		
JR-5-5195	P505022-2	Benzene	33	0.50	05/04/95	05/04/95
		Toluene	0.90	0.50		
		Ethylbenzene	ND	0.50		
		Xylenes (total)	0.83	0.50		
JR-6-5195	P505022-3	Benzene	ND	0.50	05/03/95	05/03/95
		Toluene	ND	0.50		
		Ethylbenzene	ND	0.50		
		Xylenes (total)	ND	0.50		
JR-7-5195	P505022-4	Benzene	4.6	0.50	05/03/95	05/03/95
		Toluene	ND	0.50		
		Ethylbenzene	ND	0.50		
		Xylenes (total)	ND	0.50		
JR-8-5195	P505022-5	Benzene	ND	0.50	05/03/95	05/03/95
		Toluene	ND	0.50		
		Ethylbenzene	ND	0.50		
		Xylenes (total)	ND	0.50		
D-5195	P505022-6	Benzene	ND	0.50	05/03/95	05/03/95
		Toluene	ND	0.50		
		Ethylbenzene	ND	0.50		
		Xylenes (total)	ND	0.50		
T-5195	P505022-7	Benzene	ND	0.50	05/03/95	05/03/95
		Toluene	ND	0.50		
		Ethylbenzene	ND	0.50		
		Xylenes (total)	ND	0.50		

MRL Method Reporting Level
ND None Detected at or above the method reporting level
* See Comment Section at end of report

NORTH CREEK ANALYTICAL

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SURROGATE RECOVERIES (%)

Client: SECOR
Project: JAMES RIVER CORPORATION

NCA Number: P505022
Received: 05/02/1995

Sample Name	Analyte	Result	Control Limits
BTEX per EPA 8020			
JR-4-5195	4-Bromofluorobenzene	92	75-120
JR-5-5195	4-Bromofluorobenzene	105	75-120
JR-6-5195	4-Bromofluorobenzene	98	75-120
JR-7-5195	4-Bromofluorobenzene	90	75-120
JR-8-5195	4-Bromofluorobenzene	89	75-120
D-5195	4-Bromofluorobenzene	96	75-120
T-5195	4-Bromofluorobenzene	95	75-120

MRL Method Reporting Level
ND None Detected at or above the method reporting level
* See Comment Section at end of report

NORTH CREEK ANALYTICAL

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May 8, 1995

SECOR
P.O. Box 1508
Tualatin, OR 97062

Attention: Joe Hunt

Re: Quality Control Data
JOB # F0075-001-04
P.O.#
PROJECT - JAMES RIVER CORPORATION

NCA project number P505022.

Note: Surrogate Recoveries are included in the final report.

QUALITY CONTROL DEFINITIONS

METHOD BLANK RESULTS

The method blank is an analyte-free matrix which is carried through the same analytical process as the samples. It is used to document contamination that may result from the analytical process.

SURROGATE STANDARD

A surrogate standard (i.e., a chemical compound not expected to occur in an environmental sample) is added to each sample, blank, and matrix spike sample just prior to extraction or processing. The recovery of the surrogate standard is used to monitor for unusual matrix effects, gross sample processing errors, etc. Surrogate recovery is evaluated for acceptance by determining whether the measured concentration falls within accepted limits.

NORTH CREEK ANALYTICAL

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Accuracy is measured by percent recovery as in:

$$\% \text{ Recovery} = \frac{\text{(Measured Concentration)}}{\text{(Actual Concentration)}} \times 100$$

Precision is measured using duplicate tests by relative percent difference.

$$\text{RPD} = \frac{\text{(Result of Test 1 - Result of Test 2)}}{\text{(Result of Test 1 + Result of Test 2)/2}} \times 100$$

If you should have any questions concerning this report, please contact me.

Sincerely,

Philip Nerenberg
Laboratory Manager

NORTH CREEK ANALYTICAL

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BATCH QUALITY CONTROL RESULTS
BTEX per EPA 8020

Client: SECOR
Project: JAMES RIVER CORPORATION

NCA Project #: P505022
Received: 05/02/95

METHOD BLANK
Batch # BW95079a
Results In ug/L (ppb)

Compound	Result	MRL
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
Xylenes (total)	ND	0.50
Date Prepared	05/03/95	
Date Analyzed	05/03/95	

Surrogate Recovery (%)	Result	Control Limit
4-Bromofluorobenzene	97	75-120

NORTH CREEK ANALYTICAL

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BATCH QUALITY CONTROL RESULTS
BTEX per EPA 8020

Client: SECOR
Project: JAMES RIVER CORPORATION

NCA Project #: P505022
Received: 05/02/95

METHOD BLANK
Batch # BW95079b
Results In ug/L (ppb)

Compound	Result	MRL
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
Xylenes (total)	ND	0.50
Date Prepared	05/04/95	
Date Analyzed	05/04/95	

Surrogate Recovery (%)	Result	Control Limit
4-Bromofluorobenzene	96	75-120

MATRIX SPIKE AND MATRIX SPIKE DUPLICATE
Batch # BW95079a **Spike ID P505030-1**
Results In ug/L (ppb)

Compound	Spike Added	Sample Conc	MS Conc	MS %Rec
Benzene	20	ND	18.1	91
Chlorobenzene	20	ND	19.2	96
Ethylbenzene	20	ND	19.2	96
Toluene	20	ND	18.6	93
o-Xylene	20	ND	19.9	100

Compound	Spike Added	MSD Conc	MSD % Rec	RPD	QC Limit RPD	QC Limit % Rec
Benzene	20	18.4	92	1.1	13	67-130
Chlorobenzene	20	19.7	99	3.1	10	75-126
Ethylbenzene	20	19.7	99	3.1	15	76-124
Toluene	20	19.2	96	3.2	13	75-126
o-Xylene	20	20.1	101	1.0	13	75-126

NORTH CREEK ANALYTICAL

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BATCH QUALITY CONTROL RESULTS
BTEX per EPA 8020

Client: SECOR
Project: JAMES RIVER CORPORATION

NCA Project #: P505022
Received: 05/02/95

LABORATORY CONTROL SAMPLE
Batch # BW95079a
Results In ug/L (ppb)

Compound	True	Found	% Rec	QC Limit % Rec
Benzene	20	15.4	77	67-130
Chlorobenzene	20	16.7	84	75-126
Ethylbenzene	20	16.9	85	76-124
Toluene	20	16.2	81	75-126
o-Xylene	20	16.9	85	75-126

LABORATORY CONTROL SAMPLE
Batch # BW95079b
Results In ug/L (ppb)

Compound	True	Found	% Rec	QC Limit % Rec
Benzene	20	16.1	81	67-130
Chlorobenzene	20	17.9	90	75-126
Ethylbenzene	20	17.9	90	76-124
Toluene	20	17.1	86	75-126
o-Xylene	20	18.1	91	75-126

Chain-of Custody Number:

SECOR Chain-of Custody Record

Field Office: SECOR

Address: 7614 S.W. MOHAWK ST. P.O. BOX 1508
TUALATIN, OR 97062-1508

☐ Additional documents are attached, and are a part of this Record.

Job Name: JAMES RIVER CORPORATION

Location: 3400 N. MARINE DR
PORTLAND, OR

Project # F005-001-04 Task # _____
Project Manager JOE HUNT
Laboratory NORTH CREEK ANALYTICAL
Turnaround Time _____

Sampler's Name CHRIS CHATBURN
Sampler's Signature _____

	Sample ID	Date	Time	Matrix
1	IR-4-5195	5-1-95	13:30	WATER
2	IR-5-5195		14:05	
3	IR-6-5195		14:30	
4	IR-7-5195		15:00	
5	IR-8-5195		15:35	
6	D-5195		/	
7	T-5195		/	

Analysis Request

	HCID	TPHg/BTEX/WTPH-G 8015 (modified)/8020	TPHd/WTPH-D 8015 (modified)	TPH 418.1/WTPH 418.1	Aromatic Volatiles 602/8020	Volatile Organics 624/8240 (GC/MS)	Halogenated Volatiles 601/8010	Semi-volatile Organics 625/8270 (GC/MS)	Pesticides/PCBs 608/8080	Total Lead 7421	Priority Pollutant Metals (13)	TCLP Metals			Comments/ Instructions	Number of Containers
1					X										P505022	2
2					X											2
3					X											2
4					X											2
5					X											2
6					X											2
7					X											2
																2

Special Instructions/Comments: (BTEX) PTN 5/2/95

Relinquished by:
Sign J. Fitzgerald
Print _____
Company Secor
Time 1135 Date 5/2/95

Received
Relinquished by: _____
Sign Bob Fahsholtz
Print Bob Fahsholtz
Company NCA
Time 1135 Date 5/2/95

Relinquished by:
Sign Bob Fahsholtz
Print _____
Company _____
Time _____ Date _____

Relinquished by: _____
Sign _____
Print _____
Company NCA
Time 1420 Date 5/2/95

Sample Receipt
Total no. of containers:
Chain of custody seals:
Rec'd. in good condition/cold:
Conforms to record:

Client: _____
Client Contact: _____
Client Phone: _____

SECOR CUSTREC Rev. 9/94

Date: 5/1/95 Page 1 of 1

UST CLEANUP TELEPHONE USE REPORT

CALL FROM (TO): David Ernst DATE: 1/3/95

WITH: James River TIME:

TELEPHONE NO: ( ) 286-1621 x690

REGARDING: James River - Flex Pkg

FILE NO: 26-89-064

SUMMARY OF CALL

by middle of month expects report.
Have continued to monitor + did add. investigation

Anne Pollock
Staff Signature

JAMES RIVER CORPORATION
3400 N. Marine Dr., Portland, OR 97217-7746 503-286-1621
Mailing Address: P.O. Box 17128, Portland, OR 97217-0128

April 20, 1995

Mr. Andre Paullick
Oregon Department of Environmental Quality - Northwest Region
2020 SW 4th, Suite 400
Portland, Oregon 97201

Dear Mr. Paullick:

REFERENCE: James River Flexible Packaging UST File No. 26-89-064

This letter is in response to your letter dated March 9, 1995 concerning the above subject. SEACOR has updated the October 1, 1993 proposal to current costs. The updated includes the installation of the additional downgradient well at the location specified in you letter.

SEACOR work will begin on April 24, 1995 with the addition of the two additional monitoring wells. Sampling and test results from this project will be reported when this work is completed. Additional work will be determined on the results of the core sampling and the monitoring well sample analysis.

Sincerely,

JAMES RIVER CORPORATION

David Ernst
Environmental Manager

/de

c: Dave Moser - N.P. Bob Gilbert - CES - Camas
Spencer Maurer - Packaging Hdq. - Cincinnati File

JAMES RIVER CORPORATION
3400 N. Marine Dr., Portland, OR 97217-7746 503-286-1621
Mailing Address: P.O. Box 17128, Portland, OR 97217-0128

March 23, 1995

Mr. Andre Paullick
Oregon Department of Environmental Quality - Northwest Region
2020 SW 4th, Suite 400
Portland, Oregon 97201

Dear Mr. Paullick:

REFERENCE: James River Flexible Packaging UST File No. 26-89-064

This letter is in response to your letter dated March 9, 1995 concerning the above subject. SEACOR has updated the October 1, 1993 proposal to current costs. The updated includes the installation of the additional downgradient well at the location specified in you letter. Requisitions for this work and the associated lab testing have been routed through our approval process. I expect approval by no later than March 30, 1995.

I have confirmed with SEACOR that work on the project would start no later than two weeks after receipt of the order. I will follow this letter with actual dates the work will start as soon as the dates are established. If you have any questions please feel free to call me.

Sincerely,

JAMES RIVER CORPORATION

David Ernst
Environmental Manager

/de

c: Dave Moser - N.P. Bob Gilbert - CES - Camas
Spencer Mauer - Packaging Hdq. - Cincinnati File

Oregon

March 9, 1995

DEPARTMENT OF
ENVIRONMENTAL
QUALITY

NORTHWEST REGION

DAVID ERNST
JAMES RIVER CORPORATION
PO BOX 17128
PORTLAND OREGON 97217-0128

Re: James River-Flexible Packaging
File No. 26-89-064

Dear Mr. Ernst:

The Department has reviewed its file on the UST decommissionings and cleanups conducted at 3400 N. Marine Drive in Portland, Oregon. Based upon this review, it has been determined that the appropriate section to review the work done in the "press room" UST area is the Department's Site Assessment-Voluntary Cleanup Section. If you are interested in having Department review and a ultimately issue a "no further action letter" concerning this work, please call Gil Wistar at (503) 229-5512.

Responsibility for evaluation of the gasoline tank decommissioning and cleanup will remain the responsibility of the Underground Storage Tank Cleanup Section unless you choose to become involved with the Voluntary Cleanup Program and want the UST cleanup to be included in their review.

The UST Cleanup Section has reviewed the information on the gasoline tank release. We concur that additional investigation is necessary for the site. However, in addition to the work proposed in SECOR's October 1, 1993, proposal, another groundwater monitoring well must be installed as required by Oregon Administrative Rules (OAR) 340-122-242. We recommend that the additional downgradient well be installed approximately 40 feet west of well JR-6 and within 10 feet of the former tank excavation.

Once the additional wells are installed, quarterly sampling and monitoring must be initiated. This is necessary since not all of the wells have been sampled on a consistent quarterly schedule.

Please submit a letter by March 24, 1995, indicating when the investigation will be conducted and quarterly monitoring initiated. If you would like to meet onsite and discuss

2020 SW Fourth Avenue
Suite 400
Portland, OR 97201-4987
(503) 229-5263 Voice
TTY (503) 229-5471

ATTACHMENT 1
GROUNDWATER FIELD SAMPLING DATA SHEETS

Groundwater Monitoring Report - December 1995
Gasoline UST Area
James River Corporation, Portland, Oregon
SECOR PN: F0075-001-04
January 24, 1996

SEACOR
GROUNDWATER SAMPLING FIELD DATA SHEET

SEACOR PN: F0075-001-01 DATE: 12-8-95 WELL NO. JR-4

FACILITY NAME: James River - N. Portland Fac. TEMPERATURE: 34° (F) or °C

FIELD PERSONNEL: Erik Chapman WEATHER: Overcast

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 11.36 FT. or IN.
B. Thickness of Free Product, if present: -0- Inches
C. Total Depth of well (TD) from top of casing/piezometer: 20.00 FT. or IN.
D. Height of Water Column in casing (h = TD - SWL): 8.64 FT. or IN.
E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.			
2" diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water ____	=	4.32 PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water ____	=	____ PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water ____	=	____ PV (gallons)

PURGING METHOD: ____ DURATION: ____

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp. °C	Conduct.	SWL
1st Volume: (1.5 gal)	11:17	light	carmel	ND.	7.64	12.9	____	11.90
2nd Volume: (3.0 gal)	11:22	ND	carmel	ND	7.17	14.0	____	13.82
3rd Volume: (4.5 gal)	11:27	ND	carmel	ND	7.22	13.3	____	14.60
4th Volume:	____	____	____	____	____	____	____	____
Addl. Volumes:	____	____	____	____	____	____	____	____

TOTAL VOLUME OF WATER PURGED FROM WELL: 4.5
PURGE WATER STORED/DISPOSED OF WHERE/HOW: drum

SAMPLES COLLECTED: Depth to Water at time of sample collection: 11.83

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
JR-4	13:24	2 VOAs	HCl

COMMENTS:
Depth of water @ sampling - 11.83 ft BTOC

Casing Capacities:
2-inch hole.....0.16 gal/lin ft.
4-inch hole.....0.65 gal/lin ft.
6.5-inch hole.....1.70 gal/lin ft.
8-inch hole.....2.60 gal/lin ft.
10-inch hole.....4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: 20.00
Original Water Column: 8.64 x 0.80 = -(6.91)
Collect sample when Depth to Water measures
Less than or equal to: 13.09

SEACOR

GROUNDWATER SAMPLING FIELD DATA SHEET

SEACOR PN: F0075-001-01 DATE: 12/8/95 WELL NO. JR-5

FACILITY NAME: James River - N Portland Fac. TEMPERATURE: 34 (F) or °C

FIELD PERSONNEL: ERDC WEATHER: overcast

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 9.71 FT. or IN.

B. Thickness of Free Product, if present: _____ Inches

C. Total Depth of well (TD) from top of casing/piezometer: 22.00 FT. or IN.

D. Height of Water Column in casing (h = TD - SWL): 12.29 FT. or IN.

E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.			
2" diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water ____ =	6.15	PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water ____ =	____	PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water ____ =	____	PV (gallons)

PURGING METHOD: _____ DURATION: _____

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp.	Conduct.	SWL
1st Volume: (2.0)	12:28	0	clear	No. (slight odor)	7.48	12.3		10.87
2nd Volume: (4.0)	12:33	0	clear	↓	7.25	13.7		11.00
3rd Volume: (6.0)	12:37	0	clear	↓	7.17	13.8		11.22
4th Volume:								
Addl. Volumes:								

TOTAL VOLUME OF WATER PURGED FROM WELL: 6.0 gal

PURGE WATER STORED/DISPOSED OF WHERE/HOW: drum

SAMPLES COLLECTED: Depth to Water at time of sample collection: 10.03

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
JR-5	1438	2 VOAs	HCl

COMMENTS: DTW @ sampling - 10.03

Casing Capacities:
2-inch hole.....0.16 gal/lin ft.
4-inch hole.....0.65 gal/lin ft.
6.5-inch hole.....1.70 gal/lin ft.
8-inch hole.....2.60 gal/lin ft.
10-inch hole.....4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: 22.00

Original Water Column: 9.71 x 0.80 = -(7.77)

Collect sample when Depth to Water measures Less than or equal to: 14.23

SEACOR

GROUNDWATER SAMPLING FIELD DATA SHEET

SEACOR PN: F0075-001-01 DATE: 12/8/95 WELL NO. JR-6

FACILITY NAME: James River - N. Portland Fac TEMPERATURE: 34 (°F) or °C

FIELD PERSONNEL: ERDC WEATHER: Overcast

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 11.36 FT. or IN.
B. Thickness of Free Product, if present: 0 Inches
C. Total Depth of well (TD) from top of casing/piezometer: 22.00 FT. or IN.

D. Height of Water Column in casing (h = TD - SWL): 10.64 FT. or IN.

E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.			
2" diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water ____	=	5.32 PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water ____	=	____ PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water ____	=	____ PV (gallons)

PURGING METHOD: ____ DURATION: ____

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp. °C	Conduct.	SWL
1st Volume: (1.8)	11:37	No	carmel	No.	7.46	~~25~~ 14.0		13.15
2nd Volume: (3.6)	11:42	No	Carmel	No	7.30	15.3		15.14
3rd Volume: (5.5)	11:46	No	carmel	No	7.24	14.4		17.50
4th Volume:								
Addl. Volumes:								

TOTAL VOLUME OF WATER PURGED FROM WELL: 5.5
PURGE WATER STORED/DISPOSED OF WHERE/HOW: drum

SAMPLES COLLECTED: Depth to Water at time of sample collection: 12.08

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
JR-6	1342	2 VOA's	HCl

COMMENTS:
DTW @ sampling - 12.08

Casing Capacities:
2-inch hole.....0.16 gal/lin ft.
4-inch hole.....0.65 gal/lin ft.
6.5-inch hole.....1.70 gal/lin ft.
8-inch hole.....2.60 gal/lin ft.
10-inch hole.....4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: 22.00
Original Water Column: 10.64 x 0.80 = -(8.591
Collect sample when Depth to Water measures Less than or equal to: 13.41

SEACOR

GROUNDWATER SAMPLING FIELD DATA SHEET

SEACOR PN: F0675-001-01 DATE: 12/8/95 WELL NO. IR-7

FACILITY NAME: James River - N. Portland Fac TEMPERATURE: 34 (°F) or °C

FIELD PERSONNEL: ERDC WEATHER: overcast

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 16.69 FT. or IN.

B. Thickness of Free Product, if present: 0 Inches

C. Total Depth of well (TD) from top of casing/piezometer: 22.00 FT. or IN.

D. Height of Water Column in casing (h = TD - SWL): 5.31 FT. or IN.

E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.			
2" diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water ____ =	2.65	PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water ____ =	____	PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water ____ =	____	PV (gallons)

PURGING METHOD: ____ DURATION: ____

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp.	Conduct.	SWL
1st Volume: (0.89)	12:28	med	rust	No.	7.03	13.3	____	17.64
2nd Volume: (1.80)	12:32	med	rust	No	7.00	12.9	____	18.21
3rd Volume: (2.65)	12:35	low	~~light~~ tan	No	7.01	13.1	____	18.30
4th Volume:	____	____	____	____	____	____	____	____
Addl. Volumes:	____	____	____	____	____	____	____	____

TOTAL VOLUME OF WATER PURGED FROM WELL: 2.65

PURGE WATER STORED/DISPOSED OF WHERE/HOW: down

SAMPLES COLLECTED:

Depth to Water at time of sample collection: 16.83

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
IR-7	1408	2 VOAs	HCl

COMMENTS: DTW @ Sampling - 16.83

Casing Capacities:
- 2-inch hole.....0.16 gal/lin ft.
- 4-inch hole.....0.65 gal/lin ft.
- 6.5-inch hole.....1.70 gal/lin ft.
- 8-inch hole.....2.60 gal/lin ft.
- 10-inch hole.....4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Original Water Column: ~~16.69~~ 5.31 x 0.80 = ~~13.35~~ 4.25

Total Depth of Well: 22.00

Collect sample when Depth to Water measures Less than or equal to: ~~8.65~~ 17.75

SEACOR
GROUNDWATER SAMPLING FIELD DATA SHEET

SEACOR PN: F0075-001-01 DATE: 12/8/95 WELL NO. JR-8

FACILITY NAME: James River – N. Portland Fac TEMPERATURE: 34 (°F) or °C

FIELD PERSONNEL: ERDC WEATHER: Over cast

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 13.40 FT. or IN.
B. Thickness of Free Product, if present: 0 Inches
C. Total Depth of well (TD) from top of casing/piezometer: 22.00 FT. or IN.
D. Height of Water Column in casing (h = TD - SWL): 8.6 FT. or IN.
E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.			
2" diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water ____ =	4.30	PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water ____ =	____	PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water ____ =	____	PV (gallons)

PURGING METHOD: ____ DURATION: ____

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp.	Conduct.	SWL
1st Volume: (1.4)	12:03	med	gray	NO.	7.17	13.1	____	13.85
2nd Volume: (2.8)	12:06	med	gray	NO	7.12	13.6	____	14.10
3rd Volume: (4.3)	12:10	med	gray	NO	6.98	13.0	____	14.15
4th Volume:	____	____	____	____	____	____	____	____
Addl. Volumes:	____	____	____	____	____	____	____	____

TOTAL VOLUME OF WATER PURGED FROM WELL: 4.3 gal
PURGE WATER STORED/DISPOSED OF WHERE/HOW: drum

SAMPLES COLLECTED: Depth to Water at time of sample collection: 13.72

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
JR-8	1400	2 VOAs	HCl

COMMENTS:
DTW @ Sampling - 13.72

Casing Capacities:
2-inch hole.....0.16 gal/lin ft.
4-inch hole.....0.65 gal/lin ft.
6.5-inch hole.....1.70 gal/lin ft.
8-inch hole.....2.60 gal/lin ft.
10-inch hole.....4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: 22.00
Original Water Column: 13.40 x 0.80 = -(10.72)
Collect sample when Depth to Water measures Less than or equal to: 11.28

ATTACHMENT 2
LABORATORY DATA REPORT

Groundwater Monitoring Report - December 1995
Gasoline UST Area
James River Corporation, Portland, Oregon
SECOR PN: F0075-001-04
January 24, 1996

NORTH CREEK ANALYTICAL

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December 26, 1995

SECOR
P.O. Box 1508
Tualatin, OR 97062

Attention: Joseph Hunt

RE: JOB # F0075-001-01
P.O.#
PROJECT - JAMES RIVER-N. PORTLAND FAC.

Enclosed are test results for your samples received in this lab on Dec. 08, 1995. For your reference, these analyses have been assigned our NCA # P512130.

Solid samples are reported on a dry weight basis except for Oregon DEQ Fuels Methods and where otherwise noted.

This report will be accompanied by a separate Quality Control Data Report, unless omitted by client request.

Please call if you have any questions.

Respectfully,

Philip Nerenberg
Laboratory Manager

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BTEX per EPA 8020
Results In ug/L (ppb)

Client: SECOR
Project: JAMES RIVER-N. PORTLAND FAC.

NCA Project #: P512130
Matrix: water
Sampled: 12/08/95
Received: 12/08/95

Client ID	Lab ID	Analyte	Results	MRL	Date Prepared	Date Analyzed
JR-4	P512130-1	Benzene	ND	0.50	12/18/95	12/19/95
		Toluene	ND	0.50		
		Ethylbenzene	ND	0.50		
		Xylenes (total)	ND	0.50		
JR-6	P512130-2	Benzene	ND	0.50	12/18/95	12/19/95
		Toluene	ND	0.50		
		Ethylbenzene	ND	0.50		
		Xylenes (total)	ND	0.50		
JR-8	P512130-3	Benzene	ND	0.50	12/19/95	12/19/95
		Toluene	ND	0.50		
		Ethylbenzene	ND	0.50		
		Xylenes (total)	ND	0.50		
JR-7	P512130-4	Benzene	ND	0.50	12/19/95	12/19/95
		Toluene	ND	0.50		
		Ethylbenzene	ND	0.50		
		Xylenes (total)	ND	0.50		
JR-5	P512130-5	Benzene	35	0.50	12/19/95	12/19/95
		Toluene	1.1	0.50		
		Ethylbenzene	0.62	0.50		
		Xylenes (total)	2.0	0.50		

MRL Method Reporting Level
ND None Detected at or above the method reporting level
* See Comment Section at end of report

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SURROGATE RECOVERIES (%)

Client: SECOR
Project: JAMES RIVER-N. PORTLAND FAC.

NCA Number: P512130
Received: 12/08/1995

Sample Name	Analyte	Result	Control Limits
BTEX per EPA 8020			
JR-4	4-Bromofluorobenzene	86	75-120
JR-6	4-Bromofluorobenzene	87	75-120
JR-8	4-Bromofluorobenzene	105	75-120
JR-7	4-Bromofluorobenzene	103	75-120
JR-5	4-Bromofluorobenzene	116	75-120

MRL Method Reporting Level
ND None Detected at or above the method reporting level
* See Comment Section at end of report

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December 26, 1995

SECOR
P.O. Box 1508
Tualatin, OR 97062

Attention: Joseph Hunt

Re: Quality Control Data
JOB # F0075-001-01
P.O.#
PROJECT - JAMES RIVER-N. PORTLAND FAC.

NCA project number P512130.

Note: Surrogate Recoveries are included in the final report.

QUALITY CONTROL DEFINITIONS

METHOD BLANK RESULTS

The method blank is an analyte-free matrix which is carried through the same analytical process as the samples. It is used to document contamination that may result from the analytical process.

SURROGATE STANDARD

A surrogate standard (i.e., a chemical compound not expected to occur in an environmental sample) is added to each sample, blank, and matrix spike sample just prior to extraction or processing. The recovery of the surrogate standard is used to monitor for unusual matrix effects, gross sample processing errors, etc. Surrogate recovery is evaluated for acceptance by determining whether the measured concentration falls within accepted limits.

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Accuracy is measured by percent recovery as in:

$$\% \text{ Recovery} = \frac{\text{(Measured Concentration)}}{\text{(Actual Concentration)}} \times 100$$

Precision is measured using duplicate tests by relative percent difference.

$$\text{RPD} = \frac{\text{(Result of Test 1 - Result of Test 2)}}{\text{(Result of Test 1 + Result of Test 2)/2}} \times 100$$

If you should have any questions concerning this report, please contact me.

Sincerely,

Philip Nerenberg
Laboratory Manager

NORTH CREEK ANALYTICAL

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BATCH QUALITY CONTROL RESULTS
BTEX per EPA 8020

Client: SECOR
Project: JAMES RIVER-N. PORTLAND FAC.

NCA Project #: P512130
Received: 12/08/95

METHOD BLANK
Batch # BW95231a
Results In ug/L (ppb)

Compound	Result	MRL
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
Xylenes (total)	ND	0.50
Date Prepared	12/18/95	
Date Analyzed	12/18/95	

Surrogate Recovery (%)	Result	Control Limit
4-Bromofluorobenzene	97	75-120

NORTH CREEK ANALYTICAL

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BATCH QUALITY CONTROL RESULTS
BTEX per EPA 8020

Client: SECOR
Project: JAMES RIVER-N. PORTLAND FAC.

NCA Project #: P512130
Received: 12/08/95

METHOD BLANK
Batch # BW95231b
Results In ug/L (ppb)

Compound	Result	MRL
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
Xylenes (total)	ND	0.50
Date Prepared	12/19/95	
Date Analyzed	12/19/95	

Surrogate Recovery (%)	Result	Control Limit
4-Bromofluorobenzene	94	75-120

NORTH CREEK ANALYTICAL

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BATCH QUALITY CONTROL RESULTS
BTEX per EPA 8020

Client: SECOR
Project: JAMES RIVER-N. PORTLAND FAC.

NCA Project #: P512130
Received: 12/08/95

MATRIX SPIKE AND MATRIX SPIKE DUPLICATE
Batch # BW95231a **Spike ID P512138-1**
Results In ug/L (ppb)

Compound	Spike Added	Sample Conc	MS Conc	MS %Rec
Benzene	20	ND	19.2	96
Chlorobenzene (at)	20	ND	20.0	100
Ethylbenzene	20	ND	20.4	102
Toluene	20	ND	20.1	101
o-Xylene	20	ND	20.2	101

Compound	Spike Added	MSD Conc	MSD % Rec	RPD	QC Limit RPD	QC Limit % Rec
Benzene	20	17.6	88	8.7	13	67-130
Chlorobenzene (at)	20	17.9	90	11	10	75-126
Ethylbenzene	20	18.4	92	11	15	76-124
Toluene	20	18.2	91	11	13	75-126
o-Xylene	20	18.1	91	11	13	75-126

(at) RPD is out of control limits.

LABORATORY CONTROL SAMPLE
Batch # BW95231a
Results In ug/L (ppb)

Compound	True	Found	% Rec	QC Limit % Rec
Benzene	20	21.1	106	67-130
Chlorobenzene	20	20.9	105	75-126
Ethylbenzene	20	21.2	106	76-124
Toluene	20	20.5	103	75-126
o-Xylene	20	20.2	101	75-126

NORTH CREEK ANALYTICAL

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BATCH QUALITY CONTROL RESULTS
BTEX per EPA 8020

Client: SECOR
Project: JAMES RIVER-N. PORTLAND FAC.

NCA Project #: P512130
Received: 12/08/95

LABORATORY CONTROL SAMPLE
Batch # BW95231b
Results In ug/L (ppb)

Compound	True	Found	% Rec	QC Limit % Rec
Benzene	20	21.0	105	67-130
Chlorobenzene	20	20.7	104	75-126
Ethylbenzene	20	21.0	105	76-124
Toluene	20	20.4	102	75-126
o-Xylene	20	20.3	102	75-126

NORTH CREEK ANALYTICAL

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15055 S.W. Sequoia Parkway, Suite 110, Portland, OR 97224-7155 (503) 624-9800 FAX 684-3782

13.3

CHAIN OF CUSTODY REPORT

CLIENT: SECOR

ADDRESS: 7730 SW Mohawk St
Tualatin, OR 97062

PHONE: 691-2030 FAX:

REPORT TO: Joseph Hunt

BILLING TO: SECOR

P.O. NUMBER:

NCA QUOTE #:

PROJECT NAME: James River - N. Portland Fac.

PROJECT NUMBER: F0075-001-01

SAMPLED BY: Erik RD Chapman

SAME DAY RUSH	(+150%)
NEXT BUSINESS DAY RUSH	(+100%)
2 BUSINESS DAY RUSH	(+80%)
3 BUSINESS DAY RUSH	(+60%)
5 BUSINESS DAY RUSH	(+40%)
10 BUSINESS DAY STANDARD	(LIST PRICE)
5 BUS. DAY HYDROCARBONS	(LIST PRICE)

SAMPLE IDENTIFICATION: (NUMBER OR DESCRIPTION)	SAMPLING DATE / TIME	MATRIX (W,S,O)	# OF CONT.	Analysis Request: BTEX EPA 8020	COMMENTS & PRESERVATIVES USED	NORTH CREEK SAMPLE NUMBER
1. JR-4	12/8/95 1324	W	2	✓	HCl	PS12130-1
2. JR-6	1342			✓	HCl	2
3. JR-8	1400			✓	HCl	3
4. JR-7	1408			✓	HCl	4
5. JR-5	1438			✓	HCl	5
6.						
7.						
8.						
9.						
10.						

RELINQUISHED BY: [signature] DATE: 1500
FIRM: SECOR TIME: 12/8/95

RECEIVED BY: [signature] DATE: NOV 12-8-95
FIRM: Karin L. Stanley TIME: 1500

RELINQUISHED BY: DATE:
FIRM: TIME:

RECEIVED BY: DATE:
FIRM: TIME:

ADDITIONAL REMARKS:

PAGE 1 OF 1

26-89-064

SECOR
International Incorporated

May 17, 1995

Mr. Dave Ernst
Environmental Engineer
James River Corporation
3400 North Marine Drive
Portland, Oregon 97217

RE: Additional Groundwater Assessment Activities
Gasoline UST Area, James River Corporation
North Portland Facility
SEACOR PN: F0075-001-04
James River Purchase Order No. 95101121

Dear Mr. Ernst:

This letter report summarizes the results of additional groundwater assessment activities conducted by SECOR International Incorporated (SECOR) at the former Gasoline UST (GUST) area at the James River Corporation (JRC), North Portland facility. The site is located at 3400 North Marine Drive in Portland, Oregon, as shown in Figure 1.

The activities consisted of the installation of two additional groundwater monitoring wells and sampling/analysis of the existing and newly installed wells in the GUST area. The event was completed by SECOR during the weeks of April 24 and 30, 1995. The work was authorized under James River Purchase Order No. 95101121 and was performed in accordance with SECOR's March 16, 1995 proposal to James River Corporation.

INVESTIGATIVE HISTORY

In April 1989, one gasoline underground storage tank (UST) was decommissioned and removed from the GUST area. The analytical results of soil samples collected during the UST decommissioning indicated releases of benzene, toluene, ethylbenzene, and xylenes (BTEX). Upon completion of remedial excavation efforts, residual concentrations of these chemical compounds remained in the area soils.

To investigate the potential impact to shallow groundwater in the area, three groundwater monitoring wells, JR-4, JR-5, and JR-6, were installed in the GUST area. The wells were screened and completed in sandy clay (which generally exhibits low hydraulic conductivity) and in a hydrologic regime of moderate hydraulic gradients (0.01 foot/foot). Well JR-5 was completed hydrologically upgradient of the former gasoline UST, while wells JR-4 and JR-6 were completed cross-gradient and immediately downgradient, respectively, of the UST.

761 S.W. Mohawk St., P.O. Box 1508, Redmond, OR 97756-1508 (503) 923-2233 (503) 923-7071 FAX

The initial groundwater sample analytical results indicated concentrations of benzene, ethylbenzene, and total xylenes in monitoring well JR-5. None of the analytes were detected at or above the respective analytical method reporting limits (MRLs) in monitoring wells JR-4 and JR-6 during the initial groundwater sampling event. Based on the results of the initial sampling event, an ongoing quarterly groundwater monitoring program was initiated for the GUST area wells.

Since the initial groundwater sampling event, quarterly monitoring rounds were conducted through April 1993. During each monitoring event, groundwater elevations were recorded to determine the approximate groundwater flow direction and gradient, and groundwater samples were collected and submitted for laboratory analysis. During the three years of quarterly groundwater monitoring at the GUST area, groundwater chemical conditions fluctuated, with a general decrease in concentrations of BTEX compounds. However, benzene concentrations in GUST area well JR-5 increased during the last two quarters of 1993 above the Oregon Department of Environmental Quality (DEQ) groundwater cleanup level (GCL) of 5 parts per billion (ppb). The increase in benzene concentration may have resulted from solubilization of residual product in the vadose zone by rising groundwater levels (which occurred during the January and April 1993 quarters).

In addition to the quarterly groundwater monitoring at the site, SECOR conducted a June 11, 1993 soil boring investigation in the GUST area and a pilot vapor extraction test (PVET) on GUST well JR-5 to evaluate unsaturated zone contaminant concentrations and vapor flow characteristics. Vacuum measured in wells JR-4 and JR-6 during the PVET conducted at JR-5 indicated a relatively small radius of influence between the wells. Vapor sample results collected during the test indicated the presence of total petroleum hydrocarbons (TPH) as gasoline and BTEX. While the PVET results indicated the presence of vadose zone hydrocarbons, the analytical results from soil boring samples collected from the area did not indicate the presence of hydrocarbons at or above the MRLs.

FIELDWORK

Monitoring Well Drilling/Soil Sampling

Two additional groundwater monitoring wells, JR-7 and JR-8, were completed to depths of approximately 22 feet below ground surface (bgs) near the former GUST area (Figure 2). Well JR-7 was completed at an upgradient position to the GUST area to assess the potential for possible hydraulically upgradient BTEX sources. Well JR-8 was completed hydraulically downgradient of the former GUST excavation to satisfy requirements under Oregon Administrative Rules 340-122-242 (1)(a).

Borehole drilling was accomplished by Geo-Tech Explorations, Inc. of Tualatin, Oregon using a CME 55 truck-mounted drilling rig equipped with 6.75-inch inside-diameter hollow-stem augers. Drilling operations were conducted under the supervision of an experienced SECOR geologist. The geologist was responsible for borehole logging, soil sample field screening, well development, and groundwater sampling.

Soil samples were collected at 5-foot intervals from the unsaturated zone in each boring using a 1-3/8-inch ID split-spoon sampler. Samples were collected by driving the sampler a length of 18 inches into undisturbed material through the auger annulus with a 140-pound rig-mounted slide hammer falling 30 inches. To assist in the evaluation of subsurface deposits, a blow count record was kept which recorded the number of blows necessary to drive the sampler through each of three 6-inch intervals. Subsequent to retrieval, the entire contents of the split-spoon was field-screened and the soil was described on borehole logs using standardized nomenclature under the Unified Soil Classification System. Borehole logs are included in Attachment 1.

Soil field-screening techniques included visual observation, water sheen evaluation, and photoionization detector (PID) evaluation. Water sheen evaluation was conducted by placing a soil sample from the sampler in a decontaminated polyethylene riffle pan, mixing the sample with deionized water, and observing for sheen or phase separation. PID evaluation was performed by placing a soil sample from the sampler within a resealable plastic bag and allowing the sample to equilibrate for a period of 5 minutes within a temperature-controlled enclosure (field vehicle interior). Subsequently, the seal of the bag was opened to accommodate insertion of the PID probe, and the reading recorded. The sample field screening results did not indicate the presence of petroleum hydrocarbons or volatile compounds.

Prior to drilling each borehole, all drilling equipment, including augers, pilot bits, samplers, and drilling rod, were steam-cleaned to prevent cross-contamination. In addition, the split-spoon sampler was decontaminated with a non-phosphatic detergent wash, tap water rinse, isopropanol rinse, and a triple deionized water rinse.

All drill cuttings and excess soil samples generated during drilling were placed in DOT-approved 17-H 55-gallon drums for disposal. The drums were marked for identification of borehole number and date.

Monitoring Well Construction/Development

The wells were constructed of 2-inch diameter polyvinyl chloride (PVC) casing, 0.010-inch slotted PVC well screen, and an 8-inch bottom sump. Construction details for the wells are summarized in Table 1.

Well screens were set within 10 feet below and 5 feet above the water table surface. A sand pack of No. 8 Monterey sand was placed in the annular space between the well screen and borehole wall from the base of the sump to a minimum of 2 feet above the top of the screen. A 2-foot minimum seal of bentonite pellets was placed above the sand pack, and the remaining annular space was sealed to the surface with concrete.

Due to the well locations being situated in facility driveways/parking lots, each of the wells were completed below grade. An approximate 2-foot-long, 6-inch-diameter protective steel casing was set into the borehole with the top of the protective casing approximately 6 inches bgs. The casing was then filled with sand to provide a protective sleeve around the well casing. An 8-inch, traffic-rated, Sherwood well vault with a removable steel plate was set over the well casing and raised approximately 1 inch above ground surface. Concrete was placed around the vault and sloped away from the well completion to prevent the infiltration of surface water.

Prior to completion, the wells were developed with a surge block to compress the sand pack and eliminate drill cuttings and fines in the borehole annulus and well screen perforations during installation of the sand filter material. Subsequent to surging, 12 to 14 gallons of water were bailed from each well to evacuate the sand pack of oxidized water and ensure flow of formation water into the casing. Development water, silt, and fines removed from each well were discharged into DOT-approved 55-gallon drums and stored on site pending the analytical results. Each drum was labeled to identify the well location, date, and contents.

Well Survey

A level survey was conducted by SECOR personnel to determine the relative top-of-casing (TOC) elevations for wells JR-7 and JR-8. The TOC elevation, in conjunction with a static water level measurement, was used to determine the shallow groundwater flow direction and gradient beneath the site. Static water levels (SWLs) measured from the tops of the well casings were recorded to the nearest 0.01 foot using an electric water level indicator.

Groundwater elevation data generated from the well head survey are included in Table 2, along with data from previous events for reference. Based on the measured SWLs, SECOR calculated an average shallow groundwater gradient in the GUST area of approximately 0.05 or approximately 5 feet vertical per 100 feet horizontal. Inferred groundwater elevation contours are illustrated in Figure 3 and indicate an inferred flow direction of west-northwesterly. This flow direction is oriented approximately 106 degrees in the opposite direction as compared with the last quarterly (4/93) event conducted at the site. This change in the magnitude and orientation of flow direction

occurred during the first and second year of quarterly monitoring and may be indicative of bank discharge from the Columbia River during spring thaw and/or extraction of groundwater from the James River plant well. Gradient information from the current event is summarized with data from previous events in Table 3.

Groundwater Sampling Procedures

Sampling of GUST wells JR-4 through JR-8 was conducted on May 1, 1995. Prior to sampling the wells, the wells were evaluated for floating product or sheen with a dedicated 1.5-inch diameter polyethylene bailer to collect a sample of groundwater for visual field screening analysis. No floating product, sheen, or hydrocarbon odors were detected as a result of the field screening evaluation.

Subsequently, the wells were purged of approximately three well casing volumes of groundwater using dedicated 1.5-inch diameter polyethylene bailers. During purging, groundwater parameters, including pH, conductivity, and temperature, were recorded to evaluate the presence of formation water in the well. Purging was completed when the variance of the parameters was within 10 percent of the original readings. The groundwater parameters are recorded on the field sampling data sheets in Attachment 2.

Following the purge period, and after water levels in the wells recovered to at least 85% of static conditions, groundwater samples were collected from each well using dedicated 1.5-inch diameter polyethylene bailers. Groundwater contained within the bailer was decanted through a low volume discharge port into two laboratory-prepared 40-milliliter VOA vials to minimize volatilization during the sampling process. Each vial was preserved with hydrochloric acid, filled to capacity at zero headspace, and immediately sealed with a Teflon-septumed lid. The samples were labeled, immediately placed into an insulated cooler on ice, and transported within 24 hours of collection to the analytical laboratory, North Creek Analytical of Beaverton, Oregon, under chain-of-custody procedures. Sampler gloves were changed between each well location to minimize potential cross-contamination.

In addition to the groundwater samples, a duplicate and transport blank sample were collected for quality assurance/quality control (QA/QC) purposes. The sample duplicate was collected as a split sample from the parent well sample. The transport blank sample was prepared by the analytical laboratory using carbon-free deionized water placed into the appropriate sampling containers. The transport blank was transported to and from the project site in the sample preservation cooler along with the samples collected at the site.

SAMPLE ANALYTICAL REQUIREMENTS/RESULTS

Sample analytical requirements for the monitoring event included aromatic volatile organic (AVO) compounds, including BTEX by EPA Method 8020. Samples submitted to the project laboratory for analysis included JR-4-5195, JR-5-5195, JR-6-5195, JR-7-5195, and JR-8-5195 from the respective monitoring wells; duplicate sample D-5195; and transport blank sample T-5195.

Tables 4 and 5 summarize the sample analytical results from the May 1995 event and from all prior monitoring events for reference. As in previous quarterly monitoring events at the site, the analytical results identified benzene, toluene, and total xylenes in well JR-5 at concentrations of 33 micrograms per liter (μg/L), 0.90 μg/L, and 0.83 μg/L, respectively. The benzene concentration is above the DEQ GCL of 5 μg/L. In addition, benzene was detected in newly installed well JR-8 at a concentration of 4.6 μg/L. No AVOs were detected in wells JR-4, JR-6, or JR-7 at or above the respective laboratory method reporting limits. The complete laboratory data report, including chain-of-custody documentation, is included in Attachment 3.

CONCLUSIONS AND RECOMMENDATIONS

The groundwater analytical results from the May 1, 1995 monitoring event indicates the presence of benzene in wells JR-5 (33 μg/L) and JR-8 (4.6 μg/L). Low concentrations of toluene and total xylenes were also detected in well JR-5. While the benzene level in well JR-5 represents the lowest concentration since groundwater monitoring was initiated on September 1989, the concentration exceeds the DEQ GCL of 5 μg/L. Concentrations of toluene and total xylenes were detected below the respective GCLs.

Based on the June 11, 1993 PVET data and the continued presence of AVO compounds in well JR-5 and in the newly installed downgradient well JR-7, TPH as gasoline and BTEX compounds most likely exist in the unsaturated zone in the GUST area. This contamination probably exists in isolated areas and likely represents residual unidentified gasoline-impacted soil that existed following initial remedial excavation activities. Due to the relatively long length of time since the release, the low levels of BTEX detected in the groundwater, and the limited extent of plume migration, the residual contaminants are likely largely adsorbed to subsurface soil. Should this be the case, future contaminant advection would occur to the extent that desorption occurs. Given the fact that the site surface is sealed with asphalt, contaminant desorption/advection due to surficial infiltration of moisture would be minimal.

To date, the location of the residual gasoline-impacted soil has not been determined. A June 11, 1993 soil boring assessment was conducted adjacent to well JR-5 and beneath the concrete pad located approximately 15 feet east of well JR-5 and south of the former UST excavation to locate the source. Subsurface soil beneath the pad was suspected of harboring the residual contamination, based on the fact that the former gasoline dispensing pump and associated subsurface piping was located on and beneath the pad surface. The soil boring analytical results did not indicate the presence of fuel hydrocarbons adjacent to or beneath the pad. As a result, expenditure of additional resources to locate the source may not prove cost-effective.

SECOR recommends well JR-5 be pumped in conjunction with the performance of water-bearing zone pump test to both evaluate the extent of contamination and evaluate the hydraulic parameters in the immediate vicinity. Subsequent to the water-bearing zone pump test, an additional year of groundwater monitoring should be performed on the wells to assess current seasonal contaminant concentrations, frequency, and distribution. Groundwater sampling conducted during the year should include an initial sampling event of all wells, a second quarterly event for JR-5 and JR-7 (and other potentially impacted wells), a third event for all wells, and a final event for JR-5 and JR-7 (and other potentially impacted wells). Should the results from the first quarterly event indicate the presence of elevated benzene concentrations in wells JR-5 and/or JR-7, the wells should be structurally modified to facilitate local air sparging and vapor extraction.

Completion of the proposed water-bearing zone pump test would be performed as described in Task 4 of Attachment 1 of the March 16, 1995 proposal to James River, and facilitated under the existing purchase order. SECOR can proceed with the pump test upon your authorization. Should you have any questions regarding this report, please contact us at (503) 691-2030.

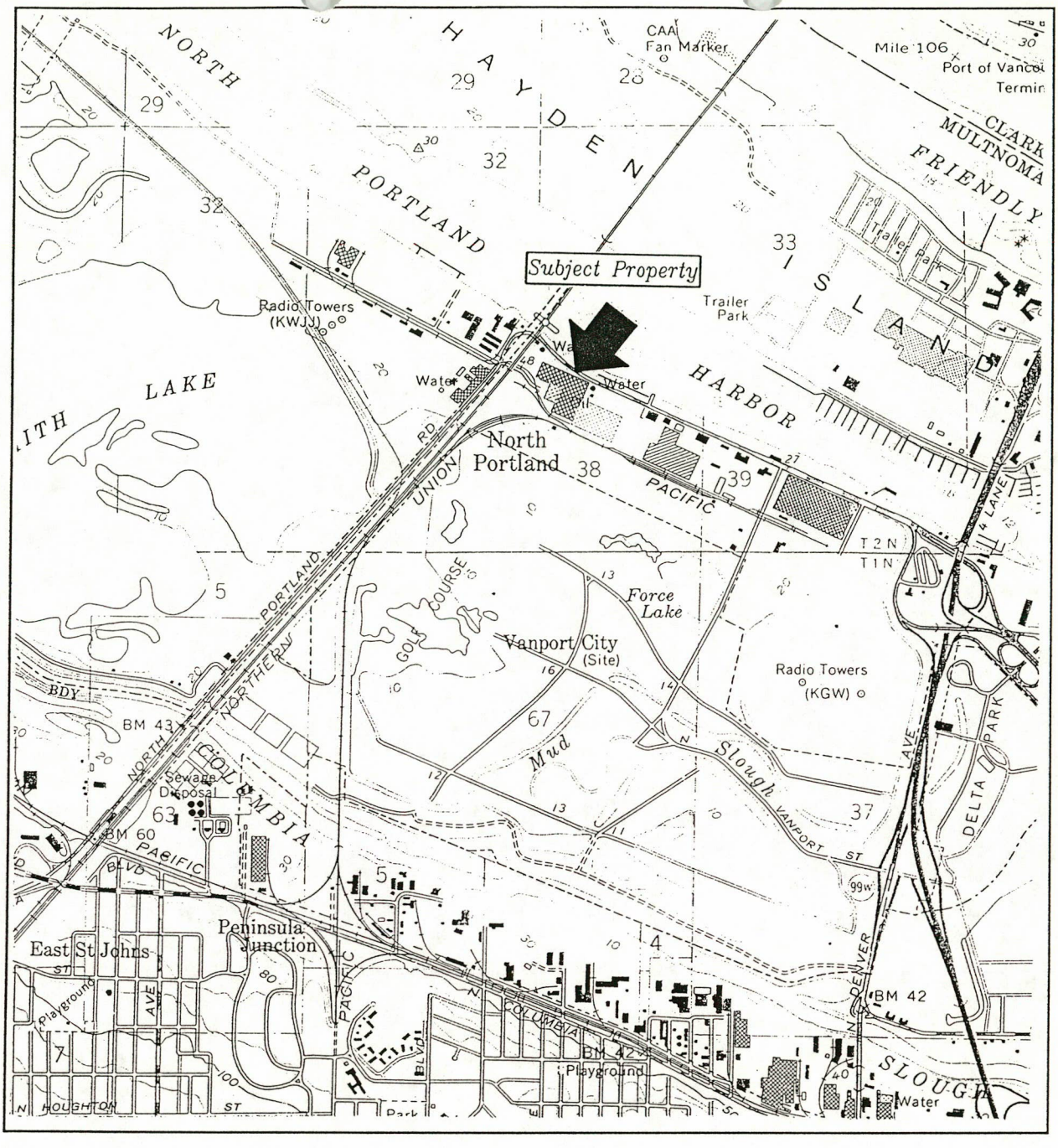
Sincerely,
SECOR International Incorporated

Joseph B. Hunt, R.G.
Senior Geologist

Steven E. Locke, P.E.
Principal Chemical Engineer

JBH/SEL:lew/kh
Attachments

FIGURES



REFERENCE: USGS 7.5X15 MINUTE QUADRANGLE, PORTLAND, OREGON (1977)

SCALE 1:24,000

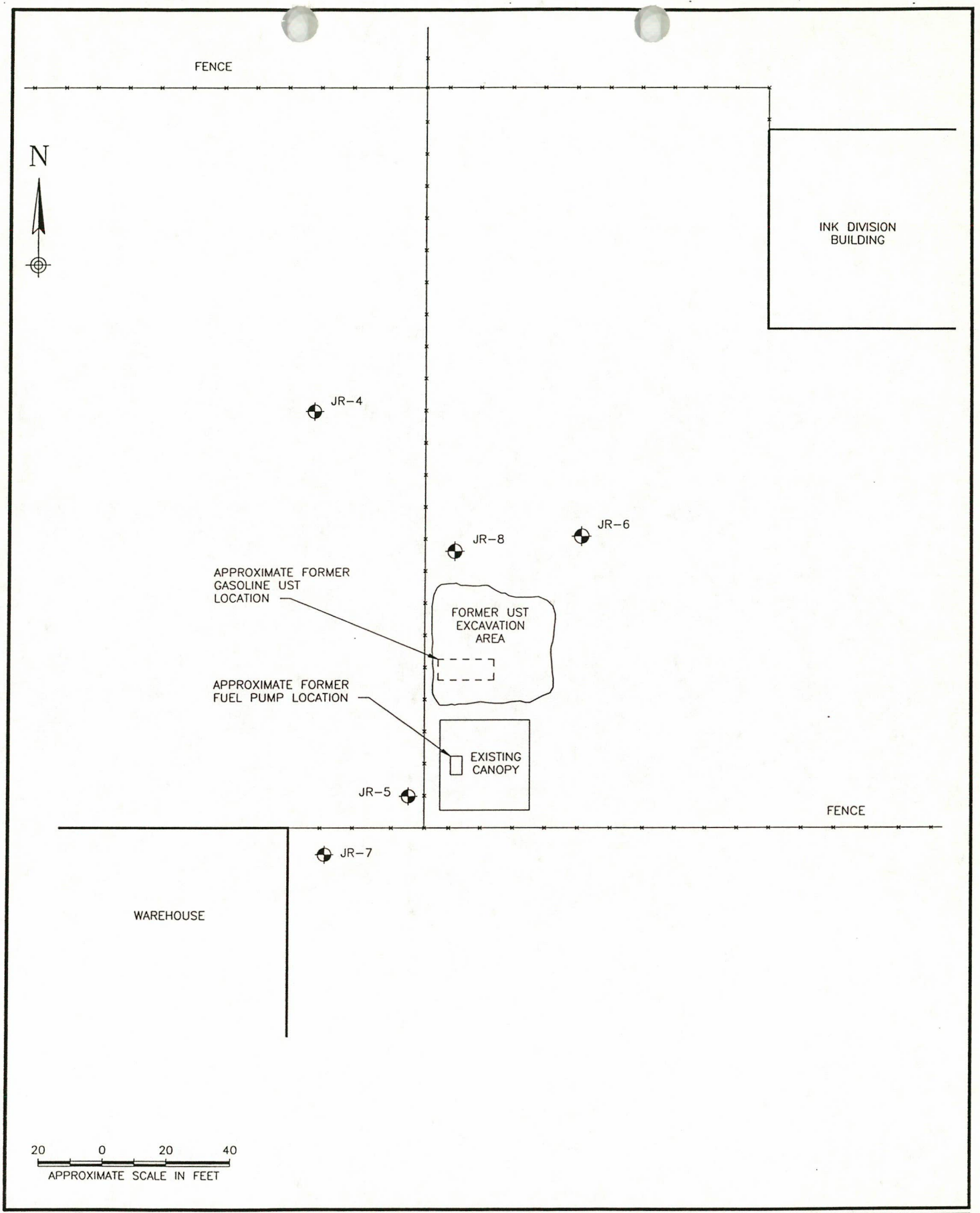
1 1/2 0 1 MILE

1,000 0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 FEET

QUADRANGLE LOCATION

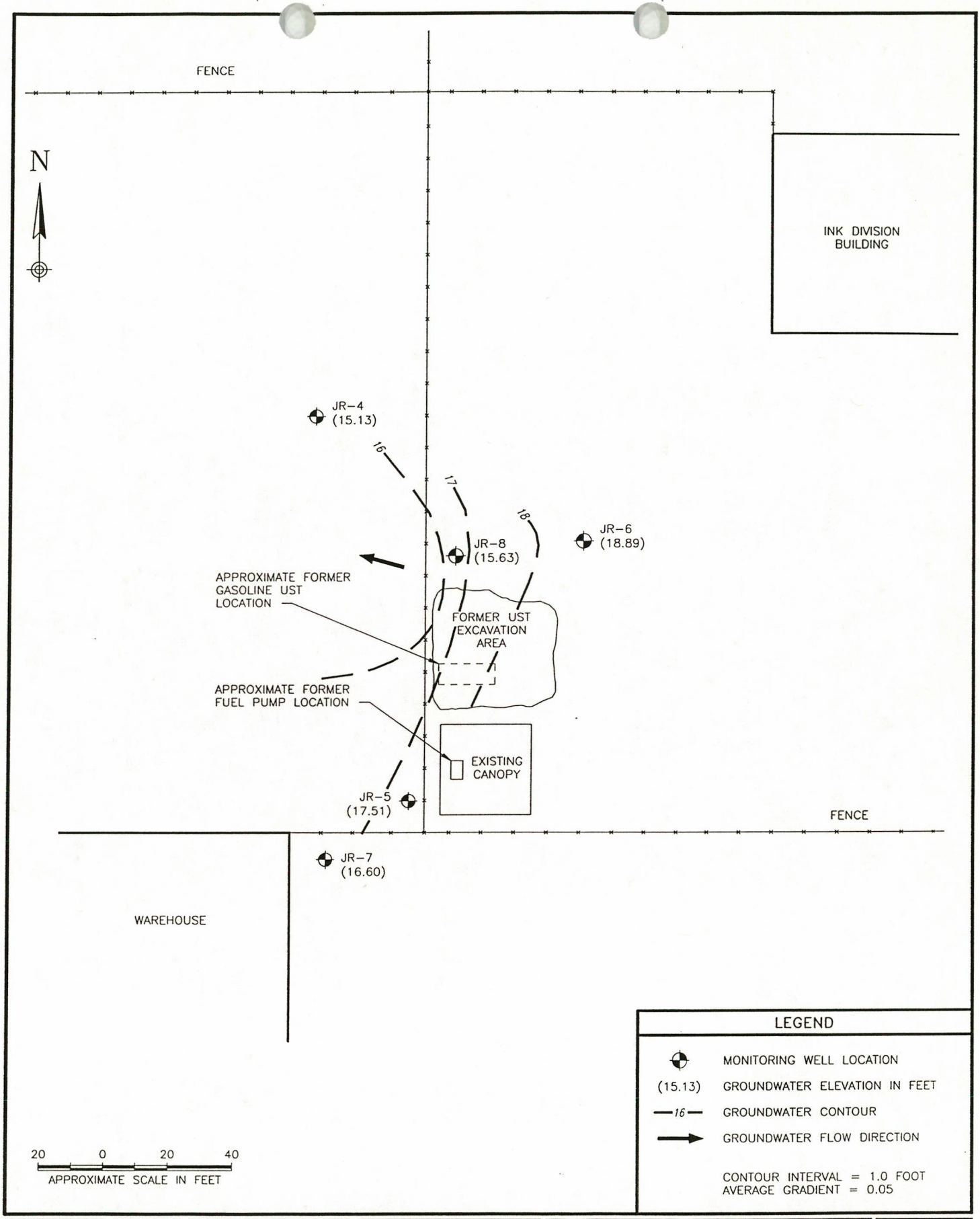
SECOR INTERNATIONAL INCORPORATED TUALATIN, OREGON	DRAWN BY: S. SPENCER APPROVED BY: [illegible] DATE: 08/31/92 JOB NO.: F0075-001-01	SITE LOCATION MAP James River Corporation North Portland Facility 3400 N. Marine Drive Portland, Oregon	FIGURE 1

LOC-1.DWG



SECOR INTERNATIONAL INCORPORATED TUALATIN, OREGON	JAMES RIVER CORPORATION 3400 N. MARINE DRIVE PORTLAND, OREGON	SITE PLAN	FIGURE: 2

JOB: F0075-001-04 DRAWN: KPW DATE: 5/3/95 APPROVED: [signature] DATE: 5-18-95



SECOR INTERNATIONAL INCORPORATED
TUALATIN, OREGON

JAMES RIVER CORPORATION
3400 N. MARINE DRIVE
PORTLAND, OREGON

HYDRAULIC GRADIENT GASOLINE UST AREA (5/1/95)

FIGURE: 3

JOB: F0075-001-04 DRAWN: KPW DATE: 5/16/95 APPROVED: GJN DATE: 5-18-95

TABLES

Table 1. Monitoring Well Construction Details
Gasoline UST Area
James River Corporation, Portland, Oregon

Well No.	Installation Date	Borehole Diameter (inches)	Casing Diameter (inches)	Total Depth (feet)	Screened Interval (feet)	Sand Pack Interval (feet)	Bentonite Seal Interval (feet)
JR-4	09/21/89	10	2	20	5-20	3-20	1-3
JR-5	09/20/89	10	2	22	8-22	6-22	4-6
JR-6	09/20/89	10	2	22	8-22	6-22	4-6
JR-7	04/24/95	10	2	22	5-22	3-22	1-3
JR-8	04/24/95	10	2	22	5-22	3-22	1-3

Table 2. Groundwater Elevation Data Summary
Gasoline UST Area
James River Corporation, Portland, Oregon
May 1, 1995

Well No.	Date	TOC[a] Elevation[b] (feet above USGS datum)	Static Water Level (feet below TOC)	Groundwater Elevation (feet)	Change in Groundwater Elevation from Previous Monitoring Event (feet)
JR-4	07/9/92	26.74	12.84	13.90	--[c]
	10/7/92		13.60	13.14	-0.76
	01/7/93		13.38	13.36	+0.22
	04/7/93		12.94	14.34	+0.98
	05/1/95		11.61	15.13	+0.79
JR-5	07/9/92	26.91	11.60	15.31	--
	10/7/92		12.04	14.87	-0.44
	01/7/93		10.56	16.35	+1.48
	04/7/93		9.84	17.07	+0.72
	05/1/95		9.40	17.51	+0.44
JR-6	07/9/92	26.81	12.82	13.99	--
	10/7/92		13.60	13.21	-0.78
	01/7/93		12.84	13.97	+0.76
	04/7/93		12.32	14.49	+0.52
	05/1/95		7.92	18.89	+4.4
JR-7	05/1/95	27.35	10.75	16.60	--
JR-8	05/1/95	26.55	10.92	15.63	--

a Top of casing.
b United States Geological Survey datum, above mean sea level.
c Initial SECOR monitoring event.

Table 3. Groundwater Gradient Summary
Gasoline UST Area
James River Corporation, Portland, Oregon
May 1, 1995

Monitoring Event		Date	Flow Direction	Gradient[a]
Initial Investigation		9/89	N 10° E	0.70
1st Year	1st quarter	2/90	N 65° W	2.61
	2nd quarter	6/90	N 84° W	1.40
	3rd quarter	9/90	N 5° W	0.81
	4th quarter	1/91	N 73° W	2.29
2nd Year	1st quarter	4/91	N 79° W	3.60
	2nd quarter	8/91	N 87° W	2.88
	3rd quarter	11/91	N 17° W	1.21
	4th quarter	2/92	N 17° E	2.27
3rd Year	1st quarter	7/92	N 25° E	1.40
	2nd quarter	10/92	N 30° E	1.73
	3rd quarter	1/93	N 15° E	2.49
	4th quarter	4/93	N 26° E	2.10
5th Year	2nd quarter	5/95	N 80° W	0.05

a Feet vertical per 100 feet horizontal.

Table 4. Current Groundwater Sample Analytical Results Summary
Gasoline UST Area
James River Corporation, Portland, Oregon
May 1, 1995

Well No.	Aromatic Volatile Organic Compounds[a] (μg/L)			
	Benzene	Toluene	Ethylbenzene	Xylenes
JR-4	<0.50[b]	<0.50	<0.50	<0.50
JR-5	**33**	**0.90**	<0.50	**0.83**
JR-6	<0.50	<0.50	<0.50	<0.50
JR-7	**4.6**	<0.50	<0.50	<0.50
JR-8	<0.50	<0.50	<0.50	<0.50
GCLs[c]	5	1,000	700	10,000

a Aromatic Volatile Organic Compounds by EPA Method 8020. Concentrations in micrograms per liter (μg/L), or approximately parts per billion.

b Concentration reported as less than the method reporting limit of 0.50 μg/L.

c Basic numeric groundwater cleanup level for petroleum UST contaminated sites as presented in Oregon Administrative Rules (OAR) Chapter 340-122-242.

Table 5. Cumulative Groundwater Analytical Detection Results Summary
Gasoline UST Area
James River Corporation, Portland, Oregon

Monitoring Event	Date	Well Number	BTEX[a]				EDB & EDC[b]	Lead
			Benzene	Toluene	Ethyl-Benzene	Total Xylenes		
Initial Investigation	9/89	JR-5	120	<1[c]	14	960	--[d]	--
1st year, 1st quarter (Duplicate)	2/90	JR-5	120 (140)	11 (14)	<1 (<1)	500 (580)	-- --	-- --
1st year, 2nd quarter (Duplicate)	6/90	JR-5	89 (76)	5 (5)	<1 (<1)	230 (220)	-- --	-- --
1st year, 3rd quarter (Duplicate)	9/90	JR-5	160 (150)	19 (18)	95 (88)	400 (400)	-- --	-- --
1st year, 4th quarter	1/91	JR-5	180	22	85	820	--	--
2nd year, 1st quarter (Duplicate)	4/91	JR-5	51 (57)	27 (27)	250 (250)	1,200 (1,200)	-- --	-- --
2nd year, 2nd quarter (Duplicate)	8/91	JR-5	94 (99)	12 (15)	290 (390)	700 (920)	-- --	-- --
2nd year, 3rd quarter (Duplicate)	11/91	JR-5	64 (70)	<5.0 (<5.0)	<5.0 (<5.0)	44 (57)	<2.0 <2.0	14[e] (31)[e]
2nd year, 4th quarter (Duplicate)	2/92	JR-5	84 (83)	9.1 (7.2)	<5.0 (<5.0)	130 (120)	<1.0 <1.0	<100[f] (<100)[f]
3rd year, 1st quarter	7/92	JR-5	49	3	2	12	<0.5	<2[g]
3rd year, 2nd quarter (Duplicate)	10/92	JR-5	17 (50)	<0.5 (2.0)	<0.5 (1.0)	3.0 (6.0)	<1.0 <0.5	<5.0[g]
3rd year, 3rd quarter	1/93	JR-5	90	7.3	3.1	63	<1.0 <0.5	<5.0[g]
3rd year, 4th quarter (Duplicate)	4/93	JR-5	140 150	6.2 6.5	3.2 3.5	34 34	-- --	-- --
5th year, 2nd quarter[h]	5/95	JR-5	33	0.90	<0.5	0.83	--	--
5th year, 2nd quarter	5/95	JR-7	4.6	<0.5	<0.5	<0.5	--	--
DEQ GCLs[i]	10/92		5	1,000	700	10,000	1 , 5	5

a By EPA Method 8020; concentrations reported in micrograms per liter (μg/L).
b Ethylene dibromide and ethylene dichloride analyses by EPA Method 8010; concentrations reported in μg/L.
c < denotes analytical method detection limit (MDL).
d -- denotes analysis not performed.
e Total lead analysis by EPA Method 3005, 7421; concentrations reported in μg/L. Because this analysis is performed on an unfiltered groundwater sample, it is likely that the elevated lead concentration indicated by this analysis is due to the dissolving of sediment containing lead during sample preservation with nitric acid.
f Organic lead analysis by the "organo-lead" method; concentrations reported in μg/L.
g Dissolved lead analysis by EPA Method 7421 on sample filtered in the field; concentrations reported in μg/L.
h Represents first sampling event conducted since 4/93
i DEQ groundwater cleanup standards (GCLs), effective October 1, 1992; concentrations reported in μg/L.

Note: Shading indicates concentrations exceed GCL.

ATTACHMENT 1
BOREHOLE LOGS

Additional Groundwater Assessment Activities Report
Gasoline UST Area
James River Corporation, Portland, Oregon
SECOR PN: F0075-001-04
May 17, 1995

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS				DESCRIPTION
COARSE GRAINED SOILS More than half is larger than No. 200 sieve	GRAVELS More than half coarse fraction is larger than No. 4 sieve size	Clean gravels with less than 5% fines	GW	Well-graded gravels or gravel sand mixture, little or no fines.
			GP	Poorly-graded gravels or gravel sand mixture, little or no fines.
		Gravels with over 12% fines	GM	Silty gravels, gravel-sand-clay mixture.
			GC	Clayey gravels, gravel-sand-clay mixture.
	SANDS More than half coarse fraction is smaller than No. 4 sieve size	Clean sands with less than 5% fines	SW	Well-graded sands or gravelly sands, little or no fines.
			SP	Poorly-graded sands or gravelly sands, little or no fines.
		Sands with over 12% fines	SM	Silty sands, sand-silt mixture.
			SC	Clayey sands, sand-clay mixture.
FINE GRAINED SOILS More than half is smaller than No. 200 sieve	SILTS AND CLAYS Liquid limit less than 50		ML	Inorganic silts and very fine rock flour or clayey fine sands or clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clay, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silt-clay of low plasticity.
	SILTS AND CLAYS Liquid limit greater than 50		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity.
HIGHLY ORGANIC SOILS			PT	Peat and other highly organic soils.

LEGEND

SAMPLE

- ■ Field Screen / Lithologic Description Sample
- ☒ Lab Sample
- ☐ No Recovery

CONTACT BETWEEN UNITS

- ——— Well Defined Change
- — — — Gradational Change
- ▬▬▬ Bottom of Hole

GROUNDWATER

- ▽ Groundwater Level at Time of Drilling
- ▼ Static Groundwater Level

BLOWS/FOOT

Hammer is 140 pounds with 30-inch drop, unless otherwise noted

S – Standard Penetration Test Sampler (2.0-inch O.D.)
T – Thin Wall Sampler (2.8-inch Sample)
H – Split Barrel Sampler (2.4-inch Sample)

$▲^{N}$ N-Value in Blows/Foot

MOISTURE DESCRIPTION

Dry – No moisture content
Damp – Low moisture content
Moist – Moderate moisture content
Wet – Near maximum moisture content
Saturated – Below water table, in capillary zone, or in perched groundwater

SHEEN

NS No Sheen
SS Slight Sheen
MS Moderate Sheen
HS Heavy Sheen
ND None Detected
ppm Parts Per Million

SECOR
INTERNATIONAL
INCORPORATED
TUALATIN, OREGON

JAMES RIVER CORPORATION
3400 N. MARINE DRIVE
PORTLAND, OREGON

SOIL CLASSIFICATION/ LEGEND

JOB: F0075-001-04 DRAWN: KPW DATE: 5/3/95 APPROVED: [illegible] DATE: 5-18-95

26-89-064

SECOR
International Incorporated

January 24, 1996

Mr. Andree Pollack
Department of Environmental Quality
2020 SW Fourth Avenue, Suite 400
Portland, Oregon 97201

RE: Groundwater Monitoring Report - December 1995
Gasoline UST Area, James River Corporation
North Portland Facility
SECOR PN: F0075-001-04

Dear Mr. Pollack:

This letter report summarizes the results of the December 1995 groundwater monitoring activities conducted by SECOR International Incorporated (SECOR) at the former Gasoline UST (GUST) area at the James River Corporation (JRC), North Portland facility. The site is located at 3400 North Marine Drive in Portland, Oregon, as shown in Figure 1. The December monitoring activities consisted of sampling/analysis of the existing wells in the GUST area. The event was completed by SECOR on December 8, 1995. The work was authorized under James River Purchase Order No. 95101121 and was performed in accordance with SECOR's March 16, 1995 proposal to James River Corporation.

In addition, this report presents a contaminant fate and release pathway evaluation for benzene, incorporating additional data, to support closure of the GUST area in conjunction with the Corrective Action Plan developed for the site in January 6, 1993. This approach is being implemented in light of risk-based corrective action legislation (RBCA) passed into Oregon law in July 1995 as part of Oregon House Bill 3352, the Recycled Lands Act. This approach was discussed with Mr. David Ernst of James River Corporation and Mr. Joseph Hunt of SECOR on January 3, 1995.

INVESTIGATIVE HISTORY

In April 1989, one gasoline underground storage tank (UST) was decommissioned and removed from the GUST area. The analytical results of soil samples collected during the UST decommissioning indicated releases of benzene, toluene, ethylbenzene, and xylenes (BTEX). Upon completion of remedial excavation efforts, residual concentrations of these chemical compounds remained in the area soils.

7730 S.W. Mohawk St., P.O. Box 1508, Tualatin, OR 97062-1508 (503) 691-2030 (503) 692-7074 FAX

To investigate the potential impact to shallow groundwater in the area, three 2-inch diameter groundwater monitoring wells, JR-4, JR-5, and JR-6, were installed in the GUST area on September 20-21, 1995. The wells were completed to depths of 22 feet in sandy clay and in a hydrologic regime of moderate hydraulic gradients (0.01 foot/foot). At the time, downgradient and upgradient hydraulic conditions at the site were assumed to be generally oriented in a north-south direction with easterly and westerly variation based on influences from the Columbia River. As such, well JR-5 was completed hydrologically upgradient (southerly) of the former gasoline UST, while wells JR-4 and JR-6 were respectively completed at cross-gradient (northwesterly) and immediately downgradient (northerly) locations. The initial groundwater sample analytical results indicated concentrations of benzene, ethylbenzene, and total xylenes in monitoring well JR-5. None of the analytes were detected at or above the respective analytical method reporting limits (MRLs) in monitoring wells JR-4 and JR-6. Based on the results of the initial sampling event, an ongoing quarterly groundwater monitoring program was initiated for the GUST area wells.

Quarterly monitoring rounds conducted on the wells through April 1993 indicated a fluctuation of chemical groundwater conditions, with a general decrease in the concentrations of BTEX compounds. However, benzene concentrations in GUST area well JR-5 increased during the last two quarters of 1993 above the Oregon Department of Environmental Quality (DEQ) groundwater cleanup level (GCL) of 5 parts per billion (ppb). As a result, SECOR conducted a June 11, 1993 soil boring investigation in the GUST area and a pilot vapor extraction test (PVET) on GUST well JR-5 to evaluate unsaturated zone contaminant concentrations and vapor flow characteristics within the area. Vacuum measured in wells JR-4 and JR-6 during the PVET conducted at JR-5 indicated a relatively small radius of influence between the wells. Vapor sample results collected during the test indicated the presence of total petroleum hydrocarbons (TPH) as gasoline and BTEX. While the PVET results indicated the presence of vadose zone hydrocarbons, the analytical results from soil boring samples collected from the area did not indicate the presence of hydrocarbons at or above the MRLs.

On April 24, 1995, two additional wells, JR-7 and JR-8, were constructed in the GUST area and an additional sampling event was performed on the area wells. Well JR-7 was placed southwest of JR-5 adjacent to the warehouse to assess the potential for possible hydraulically upgradient BTEX sources. Well JR-8 was completed hydraulically downgradient of the former GUST excavation to satisfy requirements under Oregon Administrative Rules 340-122-242 (1)(a) and directives specified in a March 9, 1995 letter from the DEQ to James River Corporation. As in the previous quarterly monitoring events at the site, the analytical results identified benzene, toluene, and total xylenes in well JR-5 at concentrations of 33 micrograms per liter (μg/L), 0.90 μg/L, and 0.83 μg/L, respectively. While still occurring above the DEQ GCL of 5 μg/L during

the April 1995 event, benzene was reported at the lowest concentration since initiation of monitoring in September 1989. In addition, benzene was detected in newly installed well downgradient JR-8 at a concentration of 4.6 μg/L. No AVOs were detected in wells JR-4, JR-6, or JR-7 at or above the respective laboratory MRLs. A description of the April 1995 well installation and groundwater sampling event is described in the May 17, 1995 letter report, Additional Groundwater Assessment Activities, Gasoline UST Area, James River Corporation.

GROUNDWATER SAMPLING EVENT-DECEMBER 8, 1995

Groundwater Sampling Procedures

Prior to sampling the wells, groundwater at each well location was visually evaluated for floating product or sheen with a dedicated 1.5-inch diameter polyethylene bailer. No floating product, sheen, or hydrocarbon odors were detected as a result of the field screening evaluation.

Subsequently, the wells were purged of approximately three well casing groundwater volumes using dedicated 1.5-inch diameter polyethylene bailers. During purging, groundwater parameters, including pH, conductivity, and temperature, were recorded to determine the presence of unoxidized formation water in the well. Purging was completed when the variance of the parameters was within 10 percent of the original readings. The groundwater parameters are recorded on the field sampling data sheets in Attachment 1.

Following the purge period, and subsequent to recovery of water levels in the wells to at least 85% of static conditions, groundwater samples were collected from each well using dedicated 1.5-inch diameter polyethylene bailers. Groundwater contained within the bailer was decanted through a low volume discharge port into two laboratory-prepared 40-milliliter glass VOA vials to minimize volatilization during the sampling process. Each vial was preserved with hydrochloric acid, filled to capacity at zero headspace, and immediately sealed with a Teflon-septumed lid. The samples were labeled, immediately placed into an insulated cooler on water ice, and transported within 24 hours of collection to the analytical laboratory, North Creek Analytical of Beaverton, Oregon, under chain-of-custody procedures. Sample analytical requirements for the monitoring event included AVO compounds, including BTEX by EPA Method 8020. Sampler gloves were changed between each well location to minimize the potential for cross-contamination.

Investigation Results

Hydraulic Conditions

Tables 1 and 2 summarize groundwater gradient information collected during the event. Groundwater gradient calculated during the December 1995 monitoring event was generally consistent with the April 1995 event and was oriented in an northwesterly direction (based on a three-point solution) at an average gradient of 0.1 foot/foot (Figure 2). Historically, average annual groundwater gradients at the site have ranged from north-northwesterly to north-northeasterly. Variation in the site hydraulic regime is most likely due to influences from the adjacent Columbia River.

Sample Analytical Results

Tables 3 and 4 respectively summarize the sample analytical results from the December 1995 event and from all prior monitoring events for reference. The completed laboratory data report for the December 1995 event, including chain-of-custody documentation, is included in Attachment 2.

The groundwater analytical results from the December 8, 1995 monitoring event indicates the presence of benzene in well JR-5 (35 μg/L) at a similar concentration to the level reported during the April 1995 monitoring event. While separated by a span of 7 months, the similarity of benzene concentrations between both events most likely indicates that a similar concentration has existed at well JR-5 during the interim period. Concentrations of toluene (1.1 μg/L), ethylbenzene (0.62 μg/L), and total xylenes (2 μg/L) were detected in well JR-5 below the respective GCLs.

FATE AND TRANSPORT EVALUATION

A fate and transport evaluation for benzene is presented to update the Environmental Risk and Exposure Assessment (EREA) as presented in the January 6, 1993 Corrective Action Plan for James River Corporation Coated Products Division. The EREA presented a qualitative discussion of the basic chemical and toxicological properties of BTEX and a matrix evaluation of the site under the October 1992 DEQ Environmental Cleanup Rules. The current evaluation will focus on benzene fate and transport and evaluate the likely environmental release pathways and impacts from the site. Specific benzene fate data cited in this evaluation was excerpted from the *Handbook of Environmental Fate and Exposure Data for Organic Chemicals, 1990.*

Benzene Source Assessment and Occurrence

Based on the June 11, 1993 PVET data and the continued presence of benzene in groundwater at well JR-5, small amounts of residual gasoline hydrocarbons most likely exist in the unsaturated zone in the GUST area. These hydrocarbons are the suspected source of the benzene currently observed in groundwater from JR-5. The source hydrocarbons most likely exist in isolated areas and likely represents residual gasoline-impacted soil that remained in place following initial remedial excavation activities. Due to the relatively long length of time since the release, the BTEX levels detected in the groundwater, and the limited extent of plume migration, the source hydrocarbons are likely largely adsorbed to subsurface soil. Should this be the case, future contaminant advection would occur to the extent that desorption occurs. Given the fact that the site surface is sealed with asphalt, contaminant desorption/advection due to surficial infiltration of moisture would be minimal.

Soil borings, drilled as part of the June 11, 1993 PVET, were located adjacent to well JR-5 and beneath the concrete pad located approximately 15 feet east of well JR-5 and south of the former UST excavation to locate the residual hydrocarbon. Subsurface soil beneath the pad was suspected of harboring the residual contamination, based on the fact that the former gasoline dispensing pump and associated subsurface piping was located on and beneath the pad surface. However, the soil boring analytical results did not indicate the presence of fuel hydrocarbons adjacent to or beneath the pad.

Benzene Fate Assessment

Terrestrial Fate: Benzene released to subsurface soil would be subject to rapid volatilization into the available soil pore volume, dissolution into soil moisture, and rapid vertical migration through soil, depending on soil type, porosity, and permeability. Adsorption of benzene to soil is not an important mechanism. Biodegradation may be significant in soil based on reported degradation percentages of 24% and 47% of an initial 20 ppm benzene inoculation in a silt in 1 and 10 weeks, respectively.

Aquatic Fate: Benzene released to surface water would be subject to rapid volatilization. Based on experimental data, estimated volatilization half-lives have ranged from 5.23 hours in a wind-wave tank with a moderate wind speed to 2.7 hours from a river of 1 meter in depth flowing 1 meter/second with a wind velocity of 3 meters per second at 20 degrees Celsius. Benzene would not be expected to significantly absorb to sediment, bioconcentrate in aquatic organisms, or undergo hydrolysis. However, due to its solubility in water, transport and dilution would become significant processes. Benzene may be subject to biodegradation based on a reported biodegradation half-life of 16 days in an aerobic river die-away test. Biodegradation rate would be based on microbial

population, acclimation time, and water temperature. Photodegradation could contribute to benzene removal in surface water systems of cold water, poor nutrient load, or other conditions less conducive to microbial degradation.

Benzene may be subject to biodegradation in shallow, aerobic groundwater but would most likely not biodegrade in anaerobic groundwater. Studies conducted in Canada have indicated benzene, in a mixture with toluene and xylene, was readily biodegraded in a shallow water-bearing zone under aerobic conditions in an unconfined sand aquifer.

Environmental Release Pathway Assessment

Four environmental pathways have been considered for release and impact of benzene. These pathways include direct contact, air, groundwater, and surface water. Based on the assessment and occurrence of suspected source hydrocarbons, the known distribution of benzene in groundwater, the current surface configuration of the site, and future uses of the site, the direct contact and air pathways were not evaluated as viable release pathways. The groundwater and surface water pathways were selected for qualitative evaluation due to the presence of benzene in groundwater and the potential for transport and impact through groundwater to surface water in the adjacent Columbia River.

Groundwater

Based on groundwater analytical data, benzene continues to impact groundwater at the JR-5 well location at the JRC facility. Concentrations have steadily decreased since the release in 1989 and have undergone significant reduction to levels below 40 ppb since May 1995. Lateral migration of benzene has not occurred extensively within the existing well network and is most likely constrained by the fine-grained fluvially-derived stratigraphy which is present at the site. Impacted groundwater at the JR-5 location is representative of the surficial water-bearing zone in the area which is not used for drinking water. Consumptive use water in the Marine Drive area is supplied by the City of Portland and no wells exist within a 0.5-mile radius from the site. The site exists within the Marine Drive industrial corridor.

Based on an October 1995 study (Rice, 1995) conducted for the California State Water Resources Control Board, the Lawrence Livermore National Laboratory evaluated impacts to groundwater from leaking USTs (LUST) at over 1,500 LUST sites in California between 1985 and 1995. The results of the study indicated that, in general, gasoline hydrocarbon plume lengths of 50 ppb or greater changed slowly and did not extend beyond 200 feet in 90 percent of the cases. In addition, a 1994 study (Wilson, 1994), cited in the October 1995 report, was conducted on the intrinsic bioremediation of fuel hydrocarbons and indicated that passive bioremediation may be

expected to stabilize the length and mass of a hydrocarbon plume. Based on these findings, the elapsed time since the release, the temporal decrease in benzene concentrations, and the stratigraphic conditions at the site, off-site groundwater impact due to benzene migration is unlikely.

Surface Water

Surface water impact to the Columbia River from benzene in GUST area groundwater could potentially occur, although unlikely. Based on the aquatic fate data for benzene, the volume and flow rate of Columbia River water, and the associated dilution of contaminant particles entering the Columbia River system, no acute or chronic effects to humans or human food chain biota would likely occur.

RECOMMENDATIONS

In light of the passage of Oregon House Bill 3352, JRC understands that DEQ is in the process of modifying the LUST cleanup decision-making process and facilitating site closures based on risked-based corrective actions and cleanup levels. Based on the this fact, the current GUST area analytical results, and the results of the benzene fate and transport evaluation, JRC proposes to sample the existing monitoring well network in the GUST area for an additional quarter. The existing wells are proposed as the compliance monitoring points. One additional quarter is proposed based on the similarity of benzene concentrations between the May and December 1995 events and the likelihood that similar concentrations would have existed during the interim "second quarterly" period. If the analytical results from the additional quarter are similar to the May and December 1995 events, JRC proposes petitioning for closure of monitoring within the GUST area. Should the results from the additional quarterly event indicate significant variation or elevated analyte concentrations, additional monitoring and remediation will be evaluated to facilitate eventual closure.

Should you have any questions regarding this report, please contact us at (503) 691-2030.

Sincerely,
SECOR International Incorporated

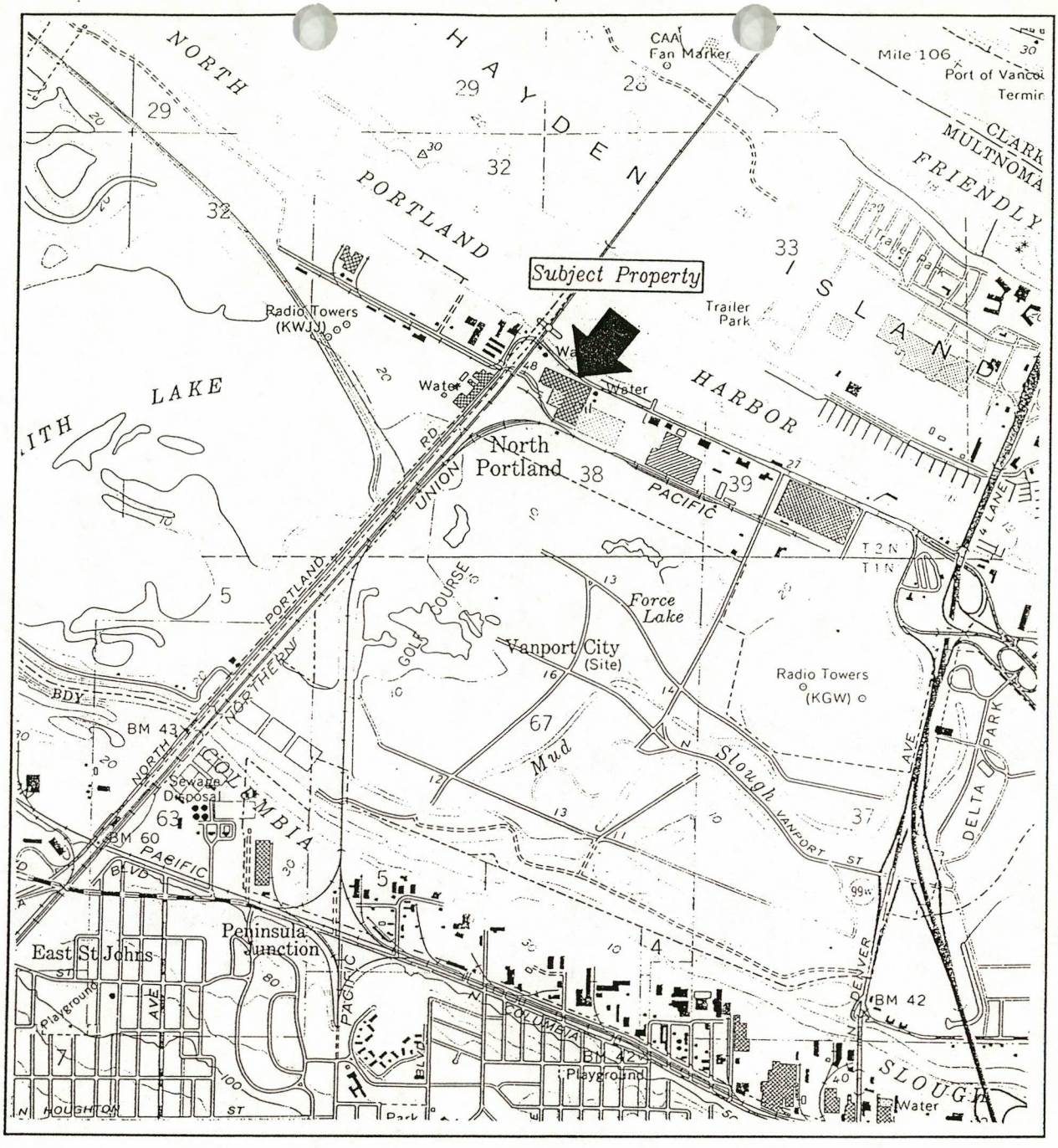
Joseph B. Hunt, R.G.
Senior Geologist

(For) Steven E. Locke, P.E.
Principal Chemical Engineer

JBH/SEL:mmf
Attachments

cc: David Ernst, James River Corporation, Portland, Oregon

FIGURES



REFERENCE: USGS 7.5X15 MINUTE QUADRANGLE, PORTLAND, OREGON (1977)

SCALE 1:24,000

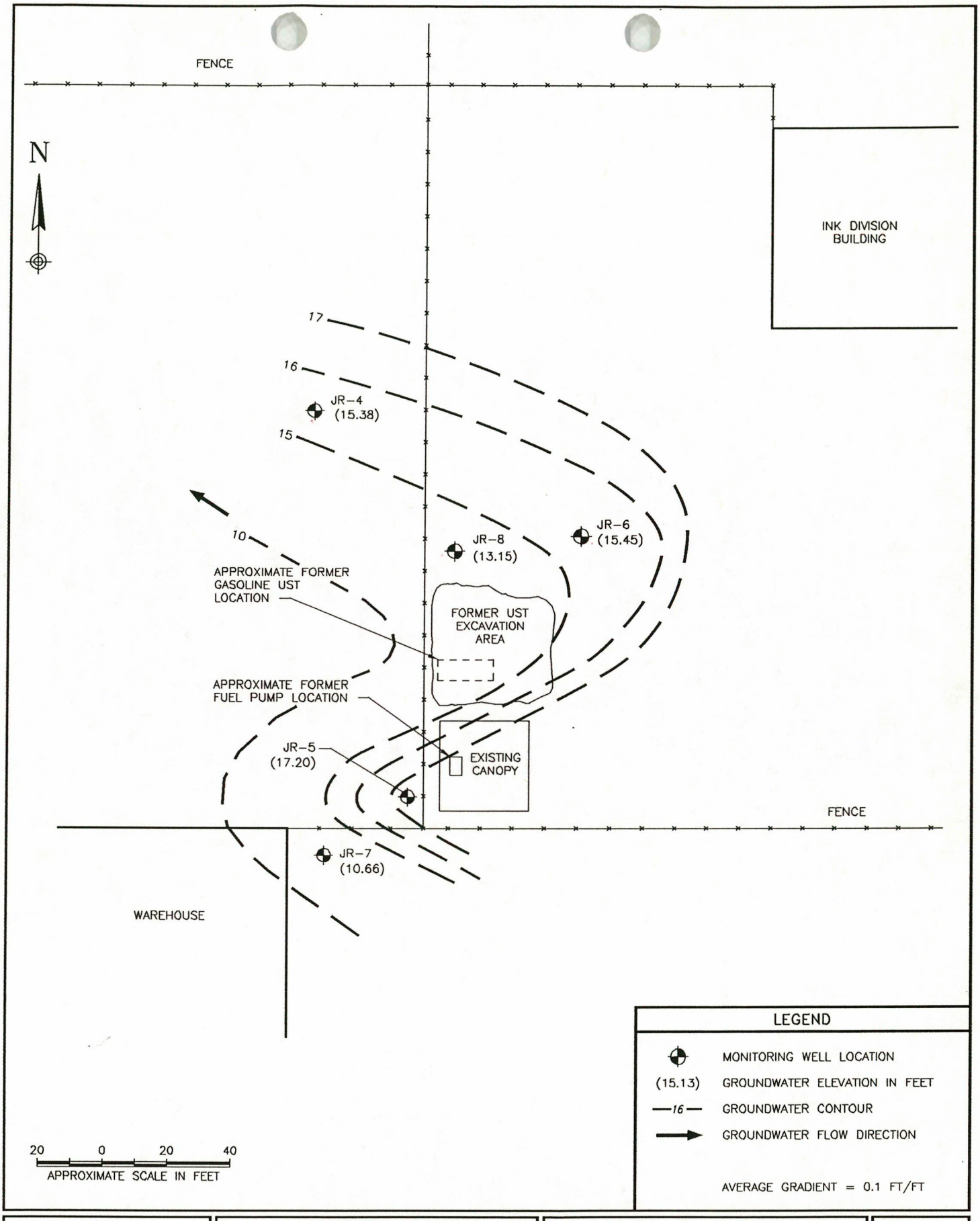
1 1/2 0 1 MILE

1,000 0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 FEET

QUADRANGLE LOCATION

SECOR INTERNATIONAL INCORPORATED TUALATIN, OREGON	DRAWN BY: S. SPENCER APPROVED BY: BDH DATE: 08/31/92 JOB NO.: F0075-001-01	SITE LOCATION MAP James River Corporation North Portland Facility 3400 N. Marine Drive Portland, Oregon	FIGURE 1

LOC-1.DWG



SECOR INTERNATIONAL INCORPORATED
TUALATIN, OREGON

JAMES RIVER CORPORATION
3400 N. MARINE DRIVE
PORTLAND, OREGON

HYDRAULIC GRADIENT GASOLINE UST AREA (12/8/95)

FIGURE: 2

JOB: F0075-001-04 DRAWN: DJM DATE: 1/9/96 APPROVED: CBH FILE:CNT-1295.DWG

TABLES

Table 1. Groundwater Elevation Data Summary
Gasoline UST Area
James River Corporation, Portland, Oregon
January 12, 1996

Well No.	Date	TOC[a] Elevation[b] (feet above USGS datum)	Static Water Level (feet below TOC)	Groundwater Elevation (feet)	Change in Groundwater Elevation from Previous Monitoring Event (feet)
JR-4	07/9/92	26.74	12.84	13.90	--[c]
	10/7/92		13.60	13.14	-0.76
	01/7/93		13.38	13.36	+0.22
	04/7/93		12.94	14.34	+0.98
	05/1/95		11.61	15.13	+0.79
	12/8/95		11.36	15.38	+0.25
JR-5	07/9/92	26.91	11.60	15.31	--
	10/7/92		12.04	14.87	-0.44
	01/7/93		10.56	16.35	+1.48
	04/7/93		9.84	17.07	+0.72
	05/1/95		9.40	17.51	+0.44
	12/8/95		9.71	17.20	-0.31
JR-6	07/9/92	26.81	12.82	13.99	--
	10/7/92		13.60	13.21	-0.78
	01/7/93		12.84	13.97	+0.76
	04/7/93		12.32	14.49	+0.52
	05/1/95		7.92	18.89	+4.4
	12/8/95		11.36	15.45	-3.44
JR-7	05/1/95	27.35	10.75	16.60	--
	12/8/95		16.69	10.66	-5.94
JR-8	05/1/95	26.55	10.92	15.63	--
	12/8/95		13.40	13.15	-2.48

a Top of casing.
b United States Geological Survey datum, above mean sea level.
c Initial SECOR monitoring event

Table 2. Groundwater Gradient Summary
Gasoline UST Area
James River Corporation, Portland, Oregon
January 12, 1996

Monitoring Event		Date	Flow Direction	Gradient[a]
Initial Investigation		9/89	N 10° E	0.70
1st Year	1st quarter	2/90	N 65° W	2.61
	2nd quarter	6/90	N 84° W	1.40
	3rd quarter	9/90	N 5° W	0.81
	4th quarter	1/91	N 73° W	2.29
2nd Year	1st quarter	4/91	N 79° W	3.60
	2nd quarter	8/91	N 87° W	2.88
	3rd quarter	11/91	N 17° W	1.21
	4th quarter	2/92	N 17° E	2.27
3rd Year	1st quarter	7/92	N 25° E	1.40
	2nd quarter	10/92	N 30° E	1.73
	3rd quarter	1/93	N 15° E	2.49
	4th quarter	4/93	N 26° E	2.10
5th Year	2nd quarter	5/95	N 80° W	0.05
	4th quarter	12/95	N 55° W	0.1

a Feet vertical per 100 feet horizontal.

Table 3. Current Groundwater Sample Analytical Results Summary
Gasoline UST Area
James River Corporation, Portland, Oregon
January 12, 1996

Well No.	Aromatic Volatile Organic Compounds[a] (μg/L)			
	Benzene	Toluene	Ethylbenzene	Xylenes
JR-4	<0.50[b]	<0.50	<0.50	<0.50
JR-5	**35**	1.1	0.62	2.0
JR-6	<0.50	<0.50	<0.50	<0.50
JR-7	<0.50	<0.50	<0.50	<0.50
JR-8	<0.50	<0.50	<0.50	<0.50
GCLs[c]	5	1,000	700	10,000

a Aromatic Volatile Organic Compounds by EPA Method 8020. Concentrations in micrograms per liter (μg/L), or approximately parts per billion.

b Concentration reported as less than the method reporting limit of 0.50 μg/L.

c Basic numeric groundwater cleanup level for petroleum UST contaminated sites as presented in Oregon Administrative Rules (OAR) Chapter 340-122-242.

Table 4. Cumulative Groundwater Analytical Detection Results Summary
Gasoline UST Area
James River Corporation, Portland, Oregon
January 12, 1996

Monitoring Event	Date	Well Number	BTEX[a]				EDB & EDC[b]	Lead
			Benzene	Toluene	Ethyl-Benzene	Total Xylenes		
Initial Investigation	9/89	JR-5	120	<1[c]	14	960	--[d]	--
1st year, 1st quarter (Duplicate)	2/90	JR-5	120 (140)	11 (14)	<1 (<1)	500 (580)	-- --	-- --
1st year, 2nd quarter (Duplicate)	6/90	JR-5	89 (76)	5 (5)	<1 (<1)	230 (220)	-- --	-- --
1st year, 3rd quarter (Duplicate)	9/90	JR-5	160 (150)	19 (18)	95 (88)	400 (400)	-- --	-- --
1st year, 4th quarter	1/91	JR-5	180	22	85	820	--	--
2nd year, 1st quarter (Duplicate)	4/91	JR-5	51 (57)	27 (27)	250 (250)	1,200 (1,200)	-- --	-- --
2nd year, 2nd quarter (Duplicate)	8/91	JR-5	94 (99)	12 (15)	290 (390)	700 (920)	-- --	-- --
2nd year, 3rd quarter (Duplicate)	11/91	JR-5	64 (70)	<5.0 (<5.0)	<5.0 (<5.0)	44 (57)	<2.0 <2.0	14[e] (31)[e]
2nd year, 4th quarter (Duplicate)	2/92	JR-5	84 (83)	9.1 (7.2)	<5.0 (<5.0)	130 (120)	<1.0 <1.0	<100[f] (<100)[f]
3rd year, 1st quarter	7/92	JR-5	49	3	2	12	<0.5	<2[g]
3rd year, 2nd quarter (Duplicate)	10/92	JR-5	17 (50)	<0.5 (2.0)	<0.5 (1.0)	3.0 (6.0)	<1.0 <0.5	<5.0[g]
3rd year, 3rd quarter	1/93	JR-5	90	7.3	3.1	63	<1.0 <0.5	<5.0[g]
3rd year, 4th quarter (Duplicate)	4/93	JR-5	140 150	6.2 6.5	3.2 3.5	34 34	-- --	-- --
5th year, 2nd quarter[h]	5/95	JR-5	33	0.90	<0.5	0.83	--	--
5th year, 2nd quarter	5/95	JR-7	4.6	<0.5	<0.5	<0.5	--	--
5th year, 4th quarter	12/95	JR-5	35	1.1	0.62	2.0		
DEQ GCLs[i]	10/92	--	5	1,000	700	10,000	1 , 5	5

a By EPA Method 8020; concentrations reported in micrograms per liter (μg/L).
b Ethylene dibromide and ethylene dichloride analyses by EPA Method 8010; concentrations reported in μg/L.
c < denotes analytical method detection limit (MDL).
d -- denotes analysis not performed.
e Total lead analysis by EPA Method 3005, 7421; concentrations reported in μg/L. Because this analysis is performed on an unfiltered groundwater sample, it is likely that the elevated lead concentration indicated by this analysis is due to the dissolving of sediment containing lead during sample preservation with nitric acid.
f Organic lead analysis by the "organo-lead" method; concentrations reported in μg/L.
g Dissolved lead analysis by EPA Method 7421 on sample filtered in the field; concentrations reported in μg/L.
h Represents first sampling event conducted since 4/93
i DEQ groundwater cleanup standards (GCLs), effective October 1, 1992; concentrations reported in μg/L.

Note: Shading indicates concentrations exceed GCL.

26-89-064

SECOR
International Incorporated

May 3, 1996

DEPT OF ENVIRONMENTAL QUALITY
RECEIVED
MAY 6 1996
NORTHWEST REGION

Mr. Andree Pollock
Department of Environmental Quality
2020 SW Fourth Avenue, Suite 400
Portland, Oregon 97201

RE: Groundwater Monitoring Report - April 1996
Gasoline UST Area, James River Corporation
North Portland Facility
SECOR PN: F0075-001-04
James River PO#: 95101121

Dear Andree:

This letter report summarizes the results of the April 1996 groundwater monitoring activities conducted by SECOR International Incorporated (SECOR) at the former Gasoline UST (GUST) area at the James River Corporation (JRC), North Portland facility. The site is located at 3400 North Marine Drive in Portland, Oregon, as shown in Figure 1. The April 1996 event was conducted based on recommendations made in the January 24, 1996 quarterly report submitted to the DEQ by JRC. The April monitoring activities consisted of sampling/analysis of the existing wells in the GUST area and was completed by SECOR on April 19, 1996. Based on the reasons stated in the January 1996 report and the results of the April 1996 event, JRC requests closure of the GUST area to further monitoring activities. The results of the April 1996 event are summarized below.

INVESTIGATIVE HISTORY

In April 1989, one gasoline UST was decommissioned and removed from the GUST area. The analytical results of soil samples collected during the UST decommissioning indicated releases of benzene, toluene, ethylbenzene, and xylenes (BTEX). Upon completion of remedial excavation efforts, residual concentrations of these chemical compounds remained in the area soils.

To investigate the potential impact to shallow groundwater in the area, three 2-inch diameter groundwater monitoring wells, JR-4, JR-5, and JR-6, were installed in the GUST area on September 20-21, 1995. The wells were completed to depths of 22 feet in sandy clay and in a hydrologic regime of moderate hydraulic gradients (0.01 foot/foot). At the time, downgradient and upgradient hydraulic conditions at the site were assumed to be generally oriented in a north-south direction with easterly and westerly variation based on influences from the Columbia River. As such, well JR-5 was completed hydrologically upgradient (southerly) of the former gasoline UST, while wells JR-4 and JR-6 were respectively completed at cross-gradient (northwesterly) and immediately downgradient (northerly) locations. The initial groundwater sample analytical results indicated concentrations of benzene, ethylbenzene, and total xylenes in monitoring well JR-5. None of the analytes were detected at or above the respective analytical method reporting limits (MRLs) in monitoring wells JR-4 and JR-6. Based on the results of the initial sampling event, an ongoing quarterly groundwater monitoring program was initiated for the GUST area wells.

7730 S.W. Mohawk St., P.O. Box 1508, Tualatin, OR 97062-1508 (503) 691-2030 (503) 692-7074 FAX

Quarterly monitoring rounds conducted on the wells through April 1993 indicated a fluctuation of chemical groundwater conditions, with a general decrease in the concentrations of BTEX compounds. However, benzene concentrations in GUST area well JR-5 increased during the last two quarters of 1993 above the Oregon Department of Environmental Quality (DEQ) groundwater cleanup level (GCL) of 5 parts per billion (ppb). As a result, SECOR conducted a June 11, 1993 soil boring investigation in the GUST area and a pilot vapor extraction test (PVET) on GUST well JR-5 to evaluate unsaturated zone contaminant concentrations and vapor flow characteristics within the area. Vacuum measured in wells JR-4 and JR-6 during the PVET conducted at JR-5 indicated a relatively small radius of influence between the wells. Vapor sample results collected during the test indicated the presence of total petroleum hydrocarbons (TPH) as gasoline and BTEX. While the PVET results indicated the presence of vadose zone hydrocarbons, the analytical results from soil boring samples collected from the area did not indicate the presence of hydrocarbons at or above the MRLs.

On April 24, 1995, two additional wells, JR-7 and JR-8, were constructed in the GUST area and an additional sampling event was performed on the area wells. Well JR-7 was placed southwest of JR-5 adjacent to the warehouse to assess the potential for possible hydraulically upgradient BTEX sources. Well JR-8 was completed hydraulically downgradient of the former GUST excavation to satisfy requirements under Oregon Administrative Rules 340-122-242 (1)(a) and directives specified in a March 9, 1995 letter from the DEQ to James River Corporation. A description of the April 1995 well installation and groundwater sampling event is described in the May 17, 1995 letter report. In addition, a subsequent quarterly groundwater monitoring event and fate and transport analysis was conducted in December 1995. The results of this event are described in the January 24, 1996 report.

GROUNDWATER SAMPLING EVENT - APRIL 19, 1996

Groundwater Sampling Procedures

Prior to sampling the wells, groundwater at each well location was visually evaluated for floating product or sheen with a dedicated 1.5-inch diameter polyethylene bailer. No floating product, sheen, or hydrocarbon odors were detected as a result of the field screening evaluation.

Subsequently, the wells were purged of approximately three well casing groundwater volumes using dedicated 1.5-inch diameter polyethylene bailers. During purging, groundwater parameters, including pH, conductivity, and temperature, were recorded to assess the presence of unoxidized formation water in the well . Purging was completed when the variance of the parameters was within 10 percent of the original readings.

Following the purge period, and subsequent to recovery of water levels in the wells to at least 85% of static conditions, groundwater samples were collected from each well using dedicated 1.5-inch diameter polyethylene bailers. Groundwater contained within the bailer was decanted through a low volume discharge port into two laboratory-prepared 40-milliliter glass VOA vials to minimize volatilization during the sampling process. Each vial was preserved with hydrochloric acid, filled to capacity at zero headspace, and immediately sealed with a Teflon-septumed lid. The samples were labeled, immediately placed into an insulated cooler with ice, and transported within 24 hours of collection to the analytical

laboratory, North Creek Analytical of Beaverton, Oregon, under chain-of-custody procedures. Sample analytical requirements for the monitoring event included aromatic volatile organic compounds, including BTEX by EPA Method 8020. Sampler gloves were changed between each well location to minimize the potential for cross-contamination.

Investigation Results

Hydraulic Conditions

Tables 1 and 2 summarize groundwater gradient information collected during the event. The groundwater flow direction calculated during the April 1996 monitoring event was oriented in a southwesterly direction (based on a three-point solution) at an average gradient of 0.04 foot/foot (Figure 2). Historically, average annual groundwater flow directions at the site have ranged from north-northwesterly to north-northeasterly. Variation in the site hydraulic regime is most likely due to influences from the adjacent Columbia River.

Sample Analytical Results

Tables 3 and 4 respectively summarize the sample analytical results from the April 1996 event and from all prior monitoring events for reference. The completed laboratory data report for the April 1996 event, including chain-of-custody documentation, is included in Attachment 1.

The groundwater analytical results from the April 1996 monitoring event indicated the presence of benzene (13 μg/L), toluene (0.55 μg/L), and total xylenes (0.81 μg/L) in well JR-5 and benzene (1.4 μg/L) and total xylenes (0.51 μg/L) in well JR-7. Of the detected constituents, benzene exhibited the greatest decrease in concentration from the December 1995 monitoring event. In general, the concentrations continued to represent an overall decrease from levels detected since initiation of monitoring in February 1990. This trend may likely be due to intrinsic biodegradation of the constituents with time.

Should you have any questions regarding this report, please contact us at (503) 691-2030.

Sincerely,
SECOR International Incorporated

Joseph B. Hunt, R.G.
Senior Geologist

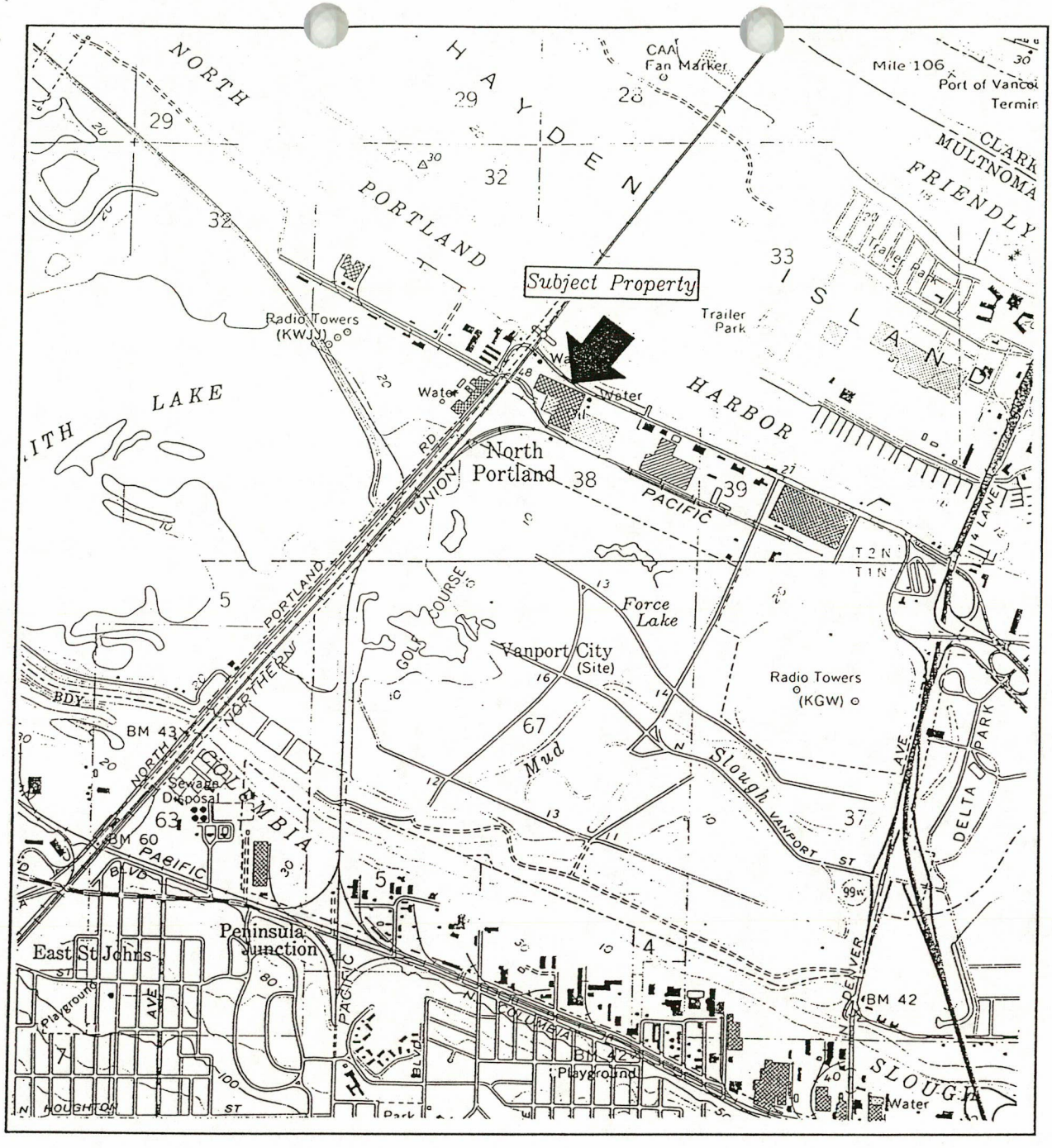
Steven E. Locke, P.E.
Principal Chemical Engineer

JBH/SEL:mmf.kld

Attachments

cc: David Ernst, James River Corporation, Portland, Oregon

FIGURES



REFERENCE: USGS 7.5X15 MINUTE QUADRANGLE, PORTLAND, OREGON (1977)

SCALE 1:24,000

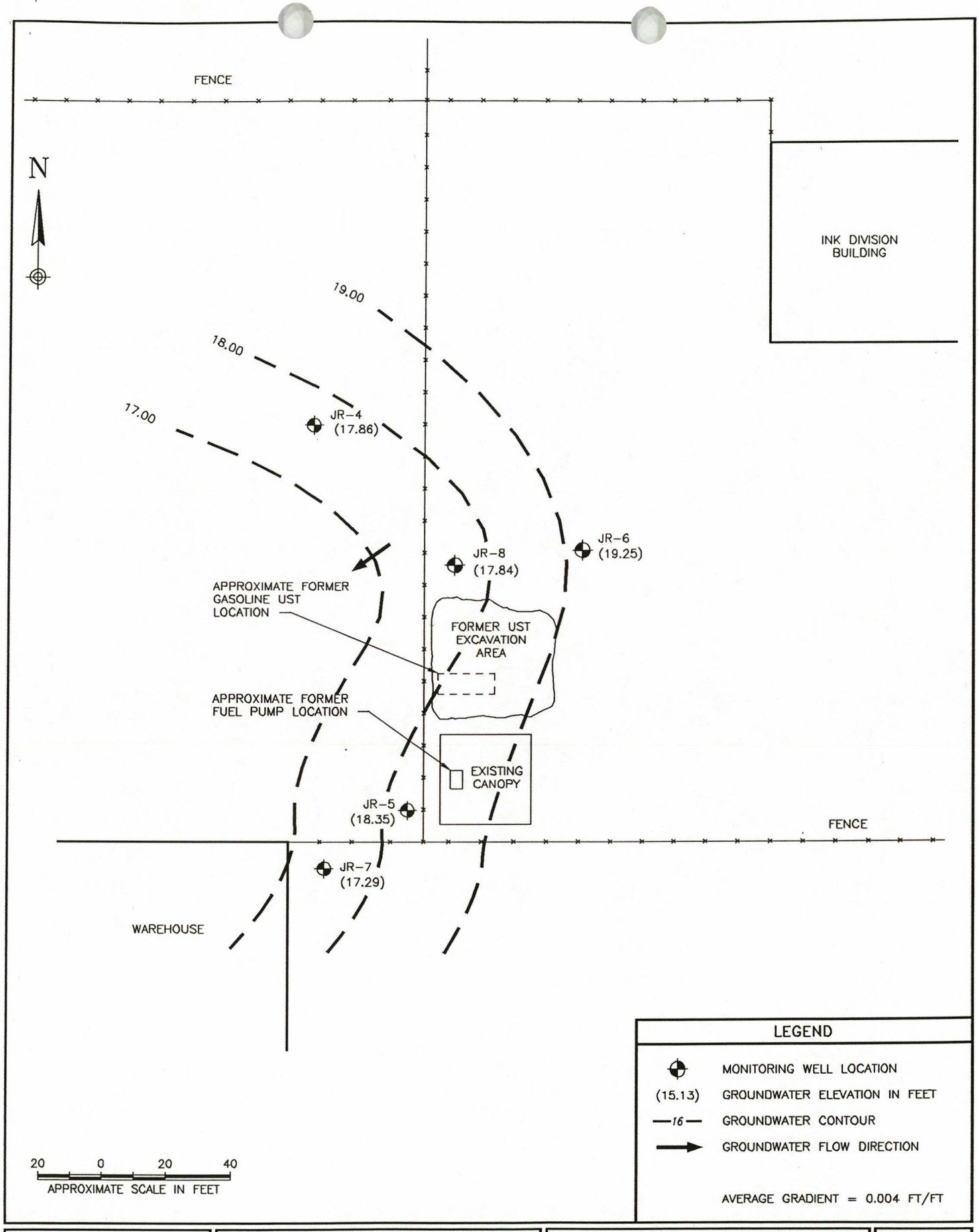
1 1/2 0 1 MILE

1,000 0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 FEET

QUADRANGLE LOCATION

SECOR INTERNATIONAL INCORPORATED TUALATIN, OREGON	DRAWN BY: S. SPENCER APPROVED BY: [illegible] DATE: 08/31/92 JOB NO.: F0075-001-01	SITE LOCATION MAP James River Corporation North Portland Facility 3400 N. Marine Drive Portland, Oregon	FIGURE 1

LOC-1.DWG



SECOR
INTERNATIONAL
INCORPORATED
TUALATIN, OREGON

JAMES RIVER CORPORATION
3400 N. MARINE DRIVE
PORTLAND, OREGON

GROUNDWATER GRADIENT MAP OF GASOLINE UST AREA (4/19/96)

FIGURE: 2

JOB: F0075-001-04 DRAWN: KPW DATE: 5/1/96 APPROVED: CJBN FILE: F0750101

TABLES

Table 1. Groundwater Elevation Data Summary
Gasoline UST Area
James River Corporation, Portland, Oregon
April 19, 1996

Well No.	Date	TOC[a] Elevation[b] (feet above USGS datum)	Static Water Level (feet below TOC)	Groundwater Elevation (feet)	Change in Groundwater Elevation from Previous Monitoring Event (feet)
JR-4	07/09/92	26.74	12.84	13.90	--[c]
	10/07/92		13.60	13.14	-0.76
	01/07/93		13.38	13.36	+0.22
	04/07/93		12.94	14.34	+0.98
	05/01/95		11.61	15.13	+0.79
	12/08/95		11.36	15.38	+0.25
	04/19/96		8.88	17.86	+2.48
JR-5	07/09/92	26.91	11.60	15.31	--
	10/07/92		12.04	14.87	-0.44
	01/07/93		10.56	16.35	+1.48
	04/07/93		9.84	17.07	+0.72
	05/01/95		9.40	17.51	+0.44
	12/08/95		9.71	17.20	-0.31
	04/19/96		8.56	18.35	+1.15
JR-6	07/09/92	26.81	12.82	13.99	--
	10/07/92		13.60	13.21	-0.78
	01/07/93		12.84	13.97	+0.76
	04/07/93		12.32	14.49	+0.52
	05/01/95		7.92	18.89	+4.4
	12/08/95		11.36	15.45	-3.44
	04/19/96		7.56	19.25	+3.80
JR-7	05/01/95	27.35	10.75	16.60	--
	12/08/95		16.69	10.66	-5.94
	04/19/96		10.06	17.29	+6.63
JR-8	05/01/95	26.55	10.92	15.63	--
	12/08/95		13.40	13.15	-2.48
	04/19/96		8.71	17.84	+4.69

a Top of casing.
b United States Geological Survey datum, above mean sea level.
c Initial SECOR monitoring event

Table 2. Groundwater Gradient Summary
Gasoline UST Area
James River Corporation, Portland, Oregon
April 19, 1996

Monitoring Event		Date	Flow Direction	Gradient[a]
Initial Investigation		9/89	N 10° E	0.70
1st Year	1st quarter	2/90	N 65° W	2.61
	2nd quarter	6/90	N 84° W	1.40
	3rd quarter	9/90	N 5° W	0.81
	4th quarter	1/91	N 73° W	2.29
2nd Year	1st quarter	4/91	N 79° W	3.60
	2nd quarter	8/91	N 87° W	2.88
	3rd quarter	11/91	N 17° W	1.21
	4th quarter	2/92	N 17° E	2.27
3rd Year	1st quarter	7/92	N 25° E	1.40
	2nd quarter	10/92	N 30° E	1.73
	3rd quarter	1/93	N 15° E	2.49
	4th quarter	4/93	N 26° E	2.10
5th Year	2nd quarter	5/95	N 80° W	0.05
	4th quarter	12/95	N 55° W	0.1
6th Year	2nd quarter	4/96	S 60° W	0.04

a Feet vertical per 100 feet horizontal.

Table 3. Current Groundwater Sample Analytical Results Summary
Gasoline UST Area
James River Corporation, Portland, Oregon
April 19, 1996

Well No.	Aromatic Volatile Organic Compounds[a] (μg/L)			
	Benzene	Toluene	Ethylbenzene	Xylenes
JR-4	<0.50[b]	<0.50	<0.50	<0.50
JR-5	**13**[c]	**0.55**	<0.50	**0.81**
JR-6	<0.50	<0.50	<0.50	<0.50
JR-7	**1.4**	<0.50	<0.50	**0.51**
JR-8	<0.50	<0.50	<0.50	<0.50
GCLs[d]	5	1,000	700	10,000

a Aromatic Volatile Organic Compounds by EPA Method 8020. Concentrations in micrograms per liter (μg/L), or approximately parts per billion.
b Concentration reported as less than the method reporting limit of 0.50 μg/L.
c **Indicates detected concentrations**.
d Basic numeric groundwater cleanup level for petroleum UST contaminated sites as presented in Oregon Administrative Rules (OAR) Chapter 340-122-242.

Table 4. Cumulative Groundwater Analytical Detection Results Summary
Gasoline UST Area
James River Corporation, Portland, Oregon
April 19, 1996

Monitoring Event	Date	Well Number	BTEX[a]				EDB & EDC[b]	Lead
			Benzene	Toluene	Ethyl-Benzene	Total Xylenes		
Initial Investigation	9/89	JR-5	120	<1[c]	14	960	--[d]	--
1st year, 1st quarter (Duplicate)	2/90	JR-5	120 (140)	11 (14)	<1 (<1)	500 (580)	-- --	-- --
1st year, 2nd quarter (Duplicate)	6/90	JR-5	89 (76)	5 (5)	<1 (<1)	230 (220)	-- --	-- --
1st year, 3rd quarter (Duplicate)	9/90	JR-5	160 (150)	19 (18)	95 (88)	400 (400)	-- --	-- --
1st year, 4th quarter	1/91	JR-5	180	22	85	820	--	--
2nd year, 1st quarter (Duplicate)	4/91	JR-5	51 (57)	27 (27)	250 (250)	1,200 (1,200)	-- --	-- --
2nd year, 2nd quarter (Duplicate)	8/91	JR-5	94 (99)	12 (15)	290 (390)	700 (920)	-- --	-- --
2nd year, 3rd quarter (Duplicate)	11/91	JR-5	64 (70)	<5.0 (<5.0)	<5.0 (<5.0)	44 (57)	<2.0 <2.0	14[e] (31)[e]
2nd year, 4th quarter (Duplicate)	2/92	JR-5	84 (83)	9.1 (7.2)	<5.0 (<5.0)	130 (120)	<1.0 <1.0	<100[f] (<100)[f]
3rd year, 1st quarter	7/92	JR-5	49	3	2	12	<0.5	<2[g]
3rd year, 2nd quarter (Duplicate)	10/92	JR-5	17 (50)	<0.5 (2.0)	<0.5 (1.0)	3.0 (6.0)	<1.0 <0.5	<5.0[g]
3rd year, 3rd quarter	1/93	JR-5	90	7.3	3.1	63	<1.0 <0.5	<5.0[g]
3rd year, 4th quarter (Duplicate)	4/93	JR-5	140 150	6.2 6.5	3.2 3.5	34 34	-- --	-- --
5th year, 2nd quarter[h]	5/95	JR-5	33	0.90	<0.5	0.83	--	--
5th year, 2nd quarter	5/95	JR-7	4.6	<0.5	<0.5	<0.5	--	--
5th year, 4th quarter	12/95	JR-5	35	1.1	0.62	2.0		
6th year, 2nd quarter (Duplicate)	4/96	JR-5	13 13	0.55 0.55	<0.5 <0.5	0.81 0.91	--	--
6th year, 2nd quarter	4/96	JR-7	1.4	<0.5	<0.5	0.51	--	--
DEQ GCLs[i]	10/92	--	5	1,000	700	10,000	1 , 5	5

a By EPA Method 8020; concentrations reported in micrograms per liter (μg/L).
b Ethylene dibromide and ethylene dichloride analyses by EPA Method 8010; concentrations reported in μg/L.
c < denotes analytical method detection limit (MDL).
d -- denotes analysis not performed.
e Total lead analysis by EPA Method 3005, 7421; concentrations reported in μg/L. Because this analysis is performed on an unfiltered groundwater sample, it is likely that the elevated lead concentration indicated by this analysis is due to the dissolving of sediment containing lead during sample preservation with nitric acid.
f Organic lead analysis by the "organo-lead" method; concentrations reported in μg/L.
g Dissolved lead analysis by EPA Method 7421 on sample filtered in the field; concentrations reported in μg/L.
h Represents first sampling event conducted since 4/93
i DEQ groundwater cleanup standards (GCLs), effective October 1, 1992; concentrations reported in μg/L.

Note: Shading indicates concentrations exceed GCL.

ATTACHMENT 1
LABORATORY DATA REPORT

Groundwater Monitoring Report - April 1996
Gasoline UST Area
James River Corporation, Portland, Oregon
SECOR PN: F0075-001-04
May 3, 1996

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

BOTHELL ■ (206) 481-9200 ■ FAX 485-2992
SPOKANE ■ (509) 924-9200 ■ FAX 924-9290
PORTLAND ■ (503) 643-9200 ■ FAX 644-2202

April 30, 1996

SECOR
P.O. Box 1508
Tualatin, OR 97062

Attention: Joe Hunt

RE: JOB # F0075-001-04
P.O.#
PROJECT - JAMES RIVER

Enclosed are test results for your samples received in this lab on Apr. 19, 1996. For your reference, these analyses have been assigned our NCA # P604301.

Solid samples are reported on a dry weight basis except for Oregon DEQ Fuels Methods and where otherwise noted.

This report will be accompanied by a separate Quality Control Data Report, unless omitted by client request.

Please call if you have any questions.

Respectfully,

Philip Nerenberg
Laboratory Manager

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

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BTEX per EPA 8020
Results In ug/L (ppb)

Client: SECOR
Project: JAMES RIVER

NCA Project #: P604301
Matrix: water
Sampled: 04/19/96
Received: 04/19/96

Client ID	Lab ID	Analyte	Results	MRL	Date Prepared	Date Analyzed
JR-4	P604301-1	Benzene	ND	0.50	04/24/96	04/25/96
		Toluene	ND	0.50		
		Ethylbenzene	ND	0.50		
		Xylenes (total)	ND	0.50		
JR-6	P604301-2	Benzene	ND	0.50	04/24/96	04/25/96
		Toluene	ND	0.50		
		Ethylbenzene	ND	0.50		
		Xylenes (total)	ND	0.50		
JR-7	P604301-3	Benzene	1.4	0.50	04/24/96	04/25/96
		Toluene	ND	0.50		
		Ethylbenzene	ND	0.50		
		Xylenes (total)	0.51	0.50		
JR-8	P604301-4	Benzene	ND	0.50	04/24/96	04/25/96
		Toluene	ND	0.50		
		Ethylbenzene	ND	0.50		
		Xylenes (total)	ND	0.50		
JR-5	P604301-5	Benzene	13	0.50	04/24/96	04/25/96
		Toluene	0.55	0.50		
		Ethylbenzene	ND	0.50		
		Xylenes (total)	0.81	0.50		
DUP	P604301-6	Benzene	13	0.50	04/24/96	04/25/96
		Toluene	0.55	0.50		
		Ethylbenzene	ND	0.50		
		Xylenes (total)	0.91	0.50		

MRL Method Reporting Level
ND None Detected at or above the method reporting level
* See Comment Section at end of report

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SPOKANE ■ (509) 924-9200 ■ FAX 924-9290
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SURROGATE RECOVERIES (%)

Client: SECOR
Project: JAMES RIVER

NCA Number: P604301
Received: 04/19/1996

Sample Name	Analyte	Result	Control Limits
BTEX per EPA 8020			
JR-4	4-Bromofluorobenzene	91	75-120
JR-6	4-Bromofluorobenzene	94	75-120
JR-7	4-Bromofluorobenzene	99	75-120
JR-8	4-Bromofluorobenzene	99	75-120
JR-5	4-Bromofluorobenzene	106	75-120
DUP	4-Bromofluorobenzene	90	75-120

MRL Method Reporting Level
ND None Detected at or above the method reporting level
* See Comment Section at end of report

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April 30, 1996

SECOR
P.O. Box 1508
Tualatin, OR 97062

Attention: Joe Hunt

Re: Quality Control Data
JOB # F0075-001-04
P.O.#
PROJECT - JAMES RIVER

NCA project number P604301.

Note: Surrogate Recoveries are included in the final report.

QUALITY CONTROL DEFINITIONS

METHOD BLANK RESULTS

The method blank is an analyte-free matrix which is carried through the same analytical process as the samples. It is used to document contamination that may result from the analytical process.

SURROGATE STANDARD

A surrogate standard (i.e., a chemical compound not expected to occur in an environmental sample) is added to each sample, blank, and matrix spike sample just prior to extraction or processing. The recovery of the surrogate standard is used to monitor for unusual matrix effects, gross sample processing errors, etc. Surrogate recovery is evaluated for acceptance by determining whether the measured concentration falls within accepted limits.

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Accuracy is measured by percent recovery as in:

$$\% \text{ Recovery} = \frac{\text{(Measured Concentration)}}{\text{(Actual Concentration)}} \times 100$$

Precision is measured using duplicate tests by relative percent difference.

$$\text{RPD} = \frac{\text{(Result of Test 1 - Result of Test 2)}}{\text{(Result of Test 1 + Result of Test 2)/2}} \times 100$$

If you should have any questions concerning this report, please contact me.

Sincerely,

Philip Nerenberg
Laboratory Manager

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

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SPOKANE ■ (509) 924-9200 ■ FAX 924-9290
PORTLAND ■ (503) 643-9200 ■ FAX 644-2202

BATCH QUALITY CONTROL RESULTS
BTEX per EPA 8020

Client: SECOR
Project: JAMES RIVER

NCA Project #: P604301
Received: 04/19/96

METHOD BLANK
Batch # BW96083a
Results In ug/L (ppb)

Compound	Result	MRL
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
Xylenes (total)	ND	0.50
Date Prepared	04/24/96	
Date Analyzed	04/24/96	

Surrogate Recovery (%)	Result	Control Limit
4-Bromofluorobenzene	103	75-120

MATRIX SPIKE AND MATRIX SPIKE DUPLICATE
Batch # BW96083a **Spike ID P604301-2a**
Results In ug/L (ppb)

Compound	Spike Added	Sample Conc	MS Conc	MS %Rec
Benzene	20	ND	18.6	93
Chlorobenzene	20	ND	19.2	96
Ethylbenzene	20	ND	19.2	96
Toluene	20	ND	18.0	90
o-Xylene	20	ND	19.3	97

Compound	Spike Added	MSD Conc	MSD % Rec	RPD	QC Limit RPD	QC Limit % Rec
Benzene	20	18.0	90	3.3	13	67-130
Chlorobenzene	20	18.6	93	3.2	10	75-126
Ethylbenzene	20	18.6	93	3.2	15	76-124
Toluene	20	17.5	88	2.2	13	75-126
o-Xylene	20	18.8	94	3.1	13	75-126

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

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PORTLAND ■ (503) 643-9200 ■ FAX 644-2202

BATCH QUALITY CONTROL RESULTS
BTEX per EPA 8020

Client: SECOR
Project: JAMES RIVER

NCA Project #: P604301
Received: 04/19/96

LABORATORY CONTROL SAMPLE
Batch # BW96083a
Results In ug/L (ppb)

Compound	True	Found	% Rec	QC Limit % Rec
Benzene	20	18.0	90	67-130
Chlorobenzene	20	18.1	91	75-126
Ethylbenzene	20	18.2	91	76-124
Toluene	20	17.5	88	75-126
o-Xylene	20	18.2	91	75-126

8.3

18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508 (206) 481-9200 FAX 485-2992
East 11115 Montgomery, Suite B, Spokane, WA 99206-4779 (509) 924-9200 FAX 924-9290
9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132 (503) 643-9200 FAX 644-2202

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

CHAIN OF CUSTODY REPORT

Work Order # P604301

REPORT TO: SECOR	INVOICE TO: SAME
ATTENTION: Joseph Hunt	ATTENTION:
ADDRESS: 7730 SW Mohawk St. Tualatin, OR 97060	ADDRESS:
PHONE: (503) 691-2030 FAX: (503) 692-7074	P.O. NUMBER: NCA QUOTE #:
PROJECT NAME: JAMES RIVER	Analysis Request: BTEX 8020
PROJECT NUMBER: F0075-001-04	
SAMPLED BY: Erik RD Chapman	

TURNAROUND REQUEST in Business Days *

Organic & Inorganic Analyses: 10 (Standard) | 7 | 5 | 4 | 3 | 2 | 1 | Same Day

Fuels & Hydrocarbon Analyses: 5 (Standard) | 3-4 | 2 | 1 | Same Day

OTHER Specify:

* Turnaround Requests less than standard may incur Rush Charges.

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NCA SAMPLE ID (Laboratory Use Only)	BTEX 8020	MATRIX (W, S, A, O)	# OF CONTAINERS	COMMENTS
1.	JR-4	4/19/96 13:00	P604301-1	X	W	2	
2.	JR-6	4/19/96 13:15	2	X	W	2	
3.	JR-7	4/19/96 13:40	3	X	W	2	
4.	JR-8	4/19/96 13:25	4	X	W	2	
5.	JR-5	4/19/96 13:55	5	X	W	2	
6.	DUP	4/19/96 —	6	X	W	2	
7.							
8.							
9.							
10.							

RELINQUISHED BY (Signature):	DATE: 4/19/96	RECEIVED BY (Signature):	DATE: 4-19-96
PRINT NAME: Erik Chapman	FIRM: SECOR TIME: 15:00	PRINT NAME: Karin Stanley	FIRM: NCA TIME: 1500
RELINQUISHED BY (Signature):	DATE:	RECEIVED BY (Signature):	DATE:
PRINT NAME:	FIRM: TIME:	PRINT NAME:	FIRM: TIME:

ADDITIONAL REMARKS:

PAGE 1 OF 1

COC Rev 8, 1/96

Oregon

November 8, 1996

DEPARTMENT OF
ENVIRONMENTAL
QUALITY

NORTHWEST REGION

Mr. David Ernst
James River Paper Company, Inc.
P.O. Box 17128
Portland, OR 97217-0128

Re: **Notice of Site Assessment Review**
James River Corp. - Flex Pack Div.
Portland, Oregon
Multnomah County
ECSI #127

Dear Mr. Ernst:

The Oregon Department of Environmental Quality (DEQ's) Site Assessment Program, which evaluates properties with known or potential environmental contamination, is performing a preliminary review of file information for the James River Flexible Packaging Div. site, located at 3400 N Marine Dr., in Portland. This review is being performed under Oregon's Environmental Cleanup Law (Oregon Revised Statutes (ORS) 465.245), as well as under an agreement with the U.S. Environmental Protection Agency (Cooperative Agreement V000339). Our records indicate you are the owner/operator contact for the site. Please contact me if this is not correct.

The site is included in DEQ's Environmental Cleanup Site Information System (ECSI), which contains information on over 1,700 Oregon facilities where hazardous substances are suspected or known to have been released to the environment.

DEQ appreciates James River's initiative in performing the soil remediation and monitoring associated with the 1989 underground storage tank removals at the site (LUST log #s 26-89-063, 26-89-064, and 26-89-088). We recognize the importance of a cooperative relationship in improving Oregon's environment and enhancing the livability of our state. We look forward to continuing this relationship.

The Site Assessment Program is interested in evaluating site contamination other than that associated with the former gasoline UST, for which James River received a "no further action" letter from DEQ several months ago. Along these lines, we want to give you an opportunity to provide any information that we may not be aware of, including investigative, monitoring, or cleanup reports that we may not have in our files. DEQ will use the information you provide to determine whether this facility will require further action, and what priority to assign such further action. Your assistance in gathering this information will help to ensure an

John A. Kitzhaber
Governor

2020 SW Fourth Avenue
Suite 400
Portland, OR 97201-4987
(503) 229-5263 Voice
TTY (503) 229-5471

accurate and thorough review of the site. We ask that you address the following questions, to the best of your knowledge, for the James River North Portland site:

1. I have reviewed DEQ's Air Quality, Water Quality, Hazardous Waste, and LUST files for the site, and have found the reports listed below that pertain to environmental investigations and remedial action. Are there any reports not included on this list that we should be aware of?

   - Additional groundwater assessment activities, former gasoline UST area, Coated Products Division, letter report from SEACOR to James River Corp., 5/17/95.
   - Proposal for additional soil and groundwater assessment, former gasoline UST area, Coated Products Division, letter report from SEACOR to James River Corp., 10/1/93.
   - Graphics Technology International - Summary of Environmental Investigations, Intermediate Storage Tank Area, Portland, Oregon, Brown and Caldwell, 8/19/93.
   - Corrective Action Plan, James River Corporation Coated Products Division, 3400 N Marine Drive, Portland, Oregon 97217, SEACOR, 7/15/93.
   - James River Corporation Decommissioning of USTs - Bldg. No. 14 North Portland Facility, Portland, Oregon, Brown and Caldwell, 2/15/91.
   - James River Corporation Soil and Groundwater Investigation, Underground Storage Tank Area (Coater No. 2 Bldg 14), Portland, Oregon, Brown and Caldwell, 5/21/90.
   - James River Corporation Soil and Groundwater Investigation, Coated Products Division, Portland, Oregon, Brown and Caldwell, 11/28/89.
   - James River Corporation Soil and Groundwater Investigation, CZ Inks Division, Portland, Oregon, Brown and Caldwell, 11/28/89.
   - James River Corporation Soil and Groundwater Investigation, Design Products Division, Portland, Oregon, Brown and Caldwell, 11/28/89.
   - James River Corporation Site Assessment, Intermediate Storage Tanks Area, Design Products Division, Portland, Oregon, Brown and Caldwell, 6/2/89.
   - Groundwater monitoring reports for shallow and deep monitoring wells, 2/90 to 4/96.

2. What are the business relationships, if any, between the following entities: 1) James River Flexible Packaging Div.; 2) James River Coated Products Div.; 3) James River CZ Inks Div.; 4) Rexham

Graphics; and 5) Graphics Technology International? Who owns (or owned) these businesses and properties, and can you provide a site plan showing current businesses/property boundaries?

3. From approximately 1961 until 1977, when the facility was connected to the City of Portland's sanitary sewer system, Crown Zellerbach operated a septic tank and a chlorinator to treat septic effluent prior to its discharge to the Columbia River. Can you provide any information or documentation on the nature of this chlorination process, including chemical(s) used for treatment?

To ensure a timely DEQ review of your site, please send me the information requested by November 27, 1996, at the address shown on the letterhead. If we do not hear from you, we will use what information we already have in performing the site review.

DEQ appreciates your cooperation in this matter. If you have any questions regarding this letter or DEQ's Site Assessment process, please feel free to contact me at (503) 229-5512.

Sincerely,

Gilbert M. Wistar

Gil Wistar, Site Assessment Specialist
DEQ Northwest Region

cc: Andree Pollock, NWR UST Section
Heather Schijf, Coordinator, Site Assessment Program
Voluntary Cleanup Program Representative
ECSI file #127

F

Oregon

DEPARTMENT OF
ENVIRONMENTAL
QUALITY

NORTHWEST REGION

September 3, 1996

DAVE ERNST
JAMES RIVER CORPORATION
3400 NORTH MARINE DRIVE
PORTLAND OREGON 97217

Re: James River Flexible Packaging
File No. 26-89-064

Dear Mr. Ernst:

The Department of Environmental Quality has completed its review of the information submitted to date concerning the underground storage tank (UST) decommissioning and cleanup conducted at 3400 North Marine Drive in Portland, Oregon. The Department has determined that the cleanup appears to have met the requirements of Oregon Administrative Rules (OAR) 340-122-205 through 340-122-360 and that no further action is required at this time.

This determination is a result of our evaluation and judgment based on the regulations and facts as we now understand them, including:

1. A 1000 gallon gasoline UST was decommissioned at this location.

2. Gasoline contamination was discovered during the decommissioning. Approximately 70 cubic yards of contaminated soil were removed from the excavation and aerated onsite. No contamination was detected in confirmatory soil samples (please refer to File No. 26-89-063, James River Ink Division for soil treatment information).

   The soil was reused as fill material onsite. The soil was not be placed in contact with waters of the state or sensitive environments (wetlands, etc.) and will be managed in a way to prevent human contact.

3. After excavation was complete, up to 270 parts per million (ppm) volatile petroleum hydrocarbons were detected remaining in the excavation. Five monitoring wells were installed at the site. A maximum of 360 ppm total petroleum hydrocarbons (TPH) were detected in the soil borings.

4. Groundwater contamination was observed in the excavation. Up to 180 parts per billion (ppb) benzene, 27 ppb toluene, 290 ppb ethylbenzene, and 1,200 ppb xylenes were detected in a well installed next to the former pump island (JR-5). The cleanup standards for these gasoline constituents are 5, 1,000, 700, and 10,000 ppb, respectively. No dissolved lead, ethylene dibromide or ethylene dichloride were detected

John A. Kitzhaber
Governor

2020 SW Fourth Avenue
Suite 400
Portland, OR 97201-4987
(503) 229-5263 Voice
TTY (503) 229-5471
DEQ-1

in the groundwater. No groundwater contamination was detected in the downgradient monitoring wells, one of which (JR-8) is located immediately next to the former UST excavation.

5. Benzene is the only gasoline constituent to exceed its cleanup criteria in groundwater. Groundwater sampling has been conducted at this site since September 1989. Benzene concentrations in JR-5 have ranged between 17 and 180 ppb.

6. For the purposes of this determination, all of the monitoring wells at the site, with the exception of JR-5, have been designated as compliance monitoring wells. No contamination has been detected in the compliance monitoring wells above cleanup standards since 1989. No groundwater supply wells are located within 0.5 miles of the site. Water at the facility is supplied by the City of Portland.

A limited amount of soil and groundwater contamination remain on this property which the Department approves leaving since the contamination does not threaten human health, safety, welfare and the environment. The Department's approval to leave contamination is based on the site conditions, including the current industrial landuse, described in the report as they exist today. Should conditions change at the site, you are responsible for further evaluation of the remaining contamination and any cleanup necessary at that time. You are also responsible for notifying potential purchasers of the property about this remaining contamination.

Prior to any of the following activities being conducted, the Department must be notified and the adequacy of the cleanup, given the proposed site changes, re-evaluated.

A. Installation of any groundwater supply wells, for any purpose.

B. Any construction or excavation, in or around the former UST and pump island.

The Department's determination will not be applicable if new or undisclosed facts show that the cleanup does not comply with the referenced rules. The Department's determination also does not apply to any conditions at the site other than the gasoline release specifically addressed in the reports.

Please note that pursuant to OAR 340-122-360(2), a copy of your report must be retained until ten (10) years after the first transfer of the property. We recommend that a copy of this information be kept with the permanent facility records.

Your efforts to comply with the regulations to ensure that your facility has been adequately cleaned up have been appreciated. If you have any questions, please feel free to contact me at (503) 229-5474.

Sincerely,

Andree Pollock
UST Cleanup Specialist

Richard Reiter
UST Section Manager

cc: Joseph Hunt
Secor
P.O. Box 1508
Tualatin, Oregon 97062-1508