MILLER | NASH

MILLER, NASH, WIENER, HAGER & CARLSEN LLP | ATTORNEYS AT LAW

**Miller, Nash, Wiener, Hager & Carlsen LLP**
3500 U.S. Bancorp Tower
111 S.W. Fifth Avenue
Portland, OR 97204-3699
(503) 224-5858
(503) 224-0155 fax

4400 Two Union Square
601 Union Street
Seattle, WA 98101-2352
(206) 622-8484
(206) 622-7485 fax

**David G. Bristol**
bristol@millernash.com
(503) 205-2526 direct line
(503) 205-8511 direct fax

September 14, 1999

Ms. Cathryn Young
Manager, Plant Engineering
Wacker Siltronic Corporation
Post Office Box 83180
Mail Stop 30
Portland, Oregon 97283-0180

Subject: Rhône-Poulenc

Dear Cathryn:

Enclosed is the executed original access agreement between Wacker Siltronic Corp. and Rhône-Poulenc Inc., to be kept with your permanent records. Please telephone me if you need anything further.

Very truly yours,

David G. Bristol

cc: Mr. Jerry B. Hodson

870689

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MILLER | NASH

MILLER, NASH, WIENER, HAGER & CARLSEN LLP | ATTORNEYS AT LAW

COPY

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3500 U.S. Bancorp Tower
111 S.W. Fifth Avenue
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(503) 224-0155 fax

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(206) 622-8484
(206) 622-7485 fax

www.millernash.com

**Jerry B. Hodson**
hodson@millernash.com
(503) 205-2335 direct line

September 7, 1999

Mr. James E. Benedict
Cable Huston et al LLP
Attorneys at Law
Suite 2000
1001 S.W. Fifth Avenue
Portland, Oregon 97204

Subject: Wacker Siltronic Corporation/Rhone-Poulenc Inc. Access Agreement

Dear Jim:

Enclosed are two duplicate originals of the access agreement, which have been executed on behalf of Wacker Siltronic Corporation. Please have the duplicate originals executed by Rhone-Poulenc and have the signatory place his or her initials next to paragraph 10, line 2, page 5, where we have typed in the amount of attorney fees. We would then appreciate receiving one of the fully executed duplicate originals.

Very truly yours,

Jerry B. Hodson

# ACCESS AGREEMENT

This Access Agreement ("Agreement") is made this ____ day of _____, 1999, between Wacker Siltronic Corp. (hereinafter "Wacker"), and Rhône-Poulenc Inc. (hereinafter "Rhône-Poulenc").

## RECITALS

1. Wacker is the owner of property located at 7200 Northwest Front Avenue in Portland, Oregon. This Agreement shall apply to that portion of the property identified by crosshatching on Exhibit A attached hereto (hereinafter the "Premises"); Rhône-Poulenc is the owner of property near the Premises.

2. Monitoring wells (the "Existing Monitoring Wells") currently exist on the Premises.

3. Rhône-Poulenc desires access to the Premises for the purpose of complying with its obligations under a certain Administrative Order on Consent between Rhône-Poulenc and the Oregon Department of Environmental Quality, DEQ No. WMCSR-NWR-99-07 (the "DEQ Order").

4. DEQ desires access for the purpose of observing Rhône-Poulenc's investigation and monitoring activities.

5. Wacker is willing to permit Rhône-Poulenc and DEQ access to the Premises under the terms and conditions set forth in this Agreement.



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AGREEMENT

In consideration of the mutual covenants and promises contained herein, the parties agree as follows:

1. Term of Agreement. This Agreement shall begin on the effective date hereof and continue until September 30, 2000, unless earlier terminated.

2. Grant of Access to Rhône-Poulenc and DEQ.

a. Wacker hereby grants to Rhône-Poulenc and DEQ, and their agents, employees, and contractors, access to the Premises, including ingress and egress as reasonably necessary to accomplish the purposes of this Agreement, subject to all the terms and conditions set forth in this Agreement; provided that without Wacker's prior written consent, which may be withheld or conditioned in its sole discretion, (i) Rhône-Poulenc may only do the following on the Premises to the extent required under the Work Plans (as defined in subparagraph 2.b.) approved by DEQ: (A) investigate the Existing Monitoring Wells on the Premises and (B) conduct cone penetrometer lithology surveys, take geoprobe reconnaissance groundwater samples, and drill bore holes on the Premises and (ii) Rhône-Poulenc may not damage or obstruct any road, driveway, or other ingress/egress point to or on the Premises.

b. Rhône-Poulenc is authorized upon 24 hours advance notice to enter and remain on the Premises, between the hours of 7:00 a.m. and 7:00 p.m. on any day during the term of this Agreement for the purposes of conducting investigatory and monitoring Work (as hereinafter defined), subject to the terms and conditions set forth in this Agreement. A representative of Wacker may (but is not required to) observe and monitor all activities conducted by or on behalf of Rhône-Poulenc under this Agreement. The Work to be conducted by Rhône-Poulenc will be conducted in phases. For the purposes of this Agreement, the term



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"Work Plans" shall mean the following work plans approved by DEQ and previously provided to Wacker:

1. Early RI Activities – Well Inventory Field Sampling Plan (Final), RPAC – Portland Site, URS Greiner Woodward Clyde, June 10, 1999;

2. Early RI Activities – CPT, Geoprobe and Well Installation Field Sampling Plan (Final), RPAC – Portland Site, URS Greiner Woodward Clyde, July 7, 1999.

The activities described in the Work Plans to be conducted on the Premises shall be referred to herein as the "Work." The Work to be performed by Rhône-Poulenc shall be conducted, to the maximum extent possible, without disruption of or interference with the use of the Premises by Wacker, its agents, assigns, or successors.

c. Rhône-Poulenc shall (i) have all Work performed in a good and workmanlike manner; (ii) timely pay for all Work; (iii) keep the Premises free and clear of all mechanic's liens and other encumbrances; (iv) promptly repair any damage caused by its access to the Premises; and (v) cause no release of any hazardous materials on the Premises or other environmental damage or deterioration to any portion of the Premises; and (vi) at all times while on the Premises comply with all applicable federal, state, local laws and regulations, including (without limitation) the DEQ Order.

3. Authorized Representatives. As used in this Agreement, the terms Rhône-Poulenc, Wacker, and DEQ include their respective employees, agents, authorized representatives, contractors, and subcontractors, retained either directly or indirectly.

4. Results of Sampling and Analysis. Rhône-Poulenc shall promptly provide to Wacker a copy of the reports submitted to DEQ of the test results obtained from sampling and



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monitoring activities conducted on the Premises. Upon written request by Wacker, Rhône-Poulenc will provide a copy of all QA/QC documentation.

5. Sampling Procedures and Duplicate Samples. All samples and analyses shall meet the requirements specified in the Work Plan. At the request of Wacker, Rhône-Poulenc will provide Wacker the opportunity to obtain, at Wacker's expense, split or duplicate samples of any samples collected by Rhône-Poulenc from the Premises. The Rhône-Poulenc analyses shall be limited to the constituents identified in the work plan submitted to DEQ, dated April 1999, namely, VOCs, dioxins/furans, metals, herbicides, phenols, and insecticides.

6. Proper Disposal. Rhône-Poulenc shall be responsible for proper procedures applicable to generation, storage, and disposal of any waste, including drill cuttings, purge volumes, and decontamination fluids and materials generated by its sampling ("Investigation Derived Waste" or "IDW"). Rhône-Poulenc may store drums of IDW temporarily on the premises for so long as reasonably necessary to arrange for transportation off the Premises but in no event shall Rhône-Poulenc store any drum on the Premises longer than 48 hours.

7. Survival of Covenants. The obligations of this Agreement shall be continuing and shall survive the termination hereof.

8. Nonacquiescence. The execution of this Agreement shall not be construed or deemed an acquiescence in or acknowledgement of any right by Rhône-Poulenc or any other person to access to the Premises, nor an acceptance of the adequacy or sufficiency of the results of sampling or any conclusion or recommendation based upon the sampling.

9. Indemnity. Rhône-Poulenc shall defend, indemnify, and hold Wacker free and harmless from any and all claims, demands, actions, suits, damages, costs, penalties, fines, or expenses (including reasonable attorney, engineering, and other professional or expert fees)



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arising out of or related to the access to or activities on the Property by or caused by any act or omission of Rhône-Poulenc, its agents, employees, subcontractors, or any other person acting on Rhône-Poulenc's behalf (hereinafter "Claim") except to the extent due to the negligent, willful, or unlawful acts or omissions of Wacker. In the event of any negligent, willful, or unlawful act or omission of Wacker that occurs in combination with any conduct or omission of Rhône-Poulenc, its agents, employees, or subcontractors or any other person acting on Rhône-Poulenc's behalf that would otherwise give rise to a Claim, Rhône-Poulenc shall indemnify Wacker except for that percentage of the damage for which Wacker is shown to be responsible under this Section. Both parties shall provide the other party with prompt written notice of any Claim which comes to the attention of such party. Rhône-Poulenc, Rhône-Poulenc's contractors (including URS Greiner Woodward Clyde), and any other person accessing the Premises on behalf of Rhône-Poulenc will be covered at all times by a current broad form comprehensive general liability policy covering bodily injury and property damage in an amount of not less than $10 million, excess liability coverage in an amount of not less than $10 million and pollution liability in an amount of not less than $10 million, and shall upon written request provide Wacker with a certificate or certificates evidencing such coverage during the time that this Agreement is effective. Wacker will be named as an additional insured with respect to all such insurance policies

10. Access Fee. In consideration of Wacker granting access to Rhône-Poulenc under this Agreement, Rhône-Poulenc will pay to Wacker the sum of $ 3,529.28 to reimburse Wacker for attorneys' fees related to the preparation of this Agreement. The attorneys' fees amount will be paid within 10 days after the date of this Agreement. In addition, Rhône-Poulenc will pay Wacker's reasonable incremental out-of-pocket costs incurred by Wacker as a result of



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Rhône-Poulenc's entry and conduct of the Work on the Premises including, without limitation, additional security measures, monitoring and oversight of the Work. Wacker shall provide Rhône-Poulenc a detailed statement of the out-of-pocket costs incurred by Wacker following the completion of the Work. Upon written request by Rhône-Poulenc, Wacker will provide documentation to support Wacker's statement of out-of-pocket costs incurred. The out-of-pocket costs shall be payable within thirty (30) days of Rhône-Poulenc's receipt of the statement of costs or receipt of the supporting documentation, if requested.

11. Notice. Notices shall be delivered in person, by facsimile to the following facsimile number or mailed to the following address and to the attention of the person specified below;

To Wacker:

Cathryn Young
Wacker Siltronic Corporation
PO Box 83180
Portland, OR 97283-0180
Fax: (503) 241-7599

To Rhône-Poulenc:

Robert L. Ferguson
RHÔNE-POULENC AG COMPANY
P.O. Box 12014
Research Triangle Park, NC 27709
Fax: (919) 549-2300



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12. Termination. This Agreement shall be revocable at will by Wacker and shall, in any event, be deemed automatically revoked on September 30, 2000.

The parties have executed this Agreement as of the date first set forth above.

RHÔNE-POULENC INC.

By: _____

Its: _____

WACKER SILTRONIC CORP.

By _____

Its: PRESIDENT / CEO

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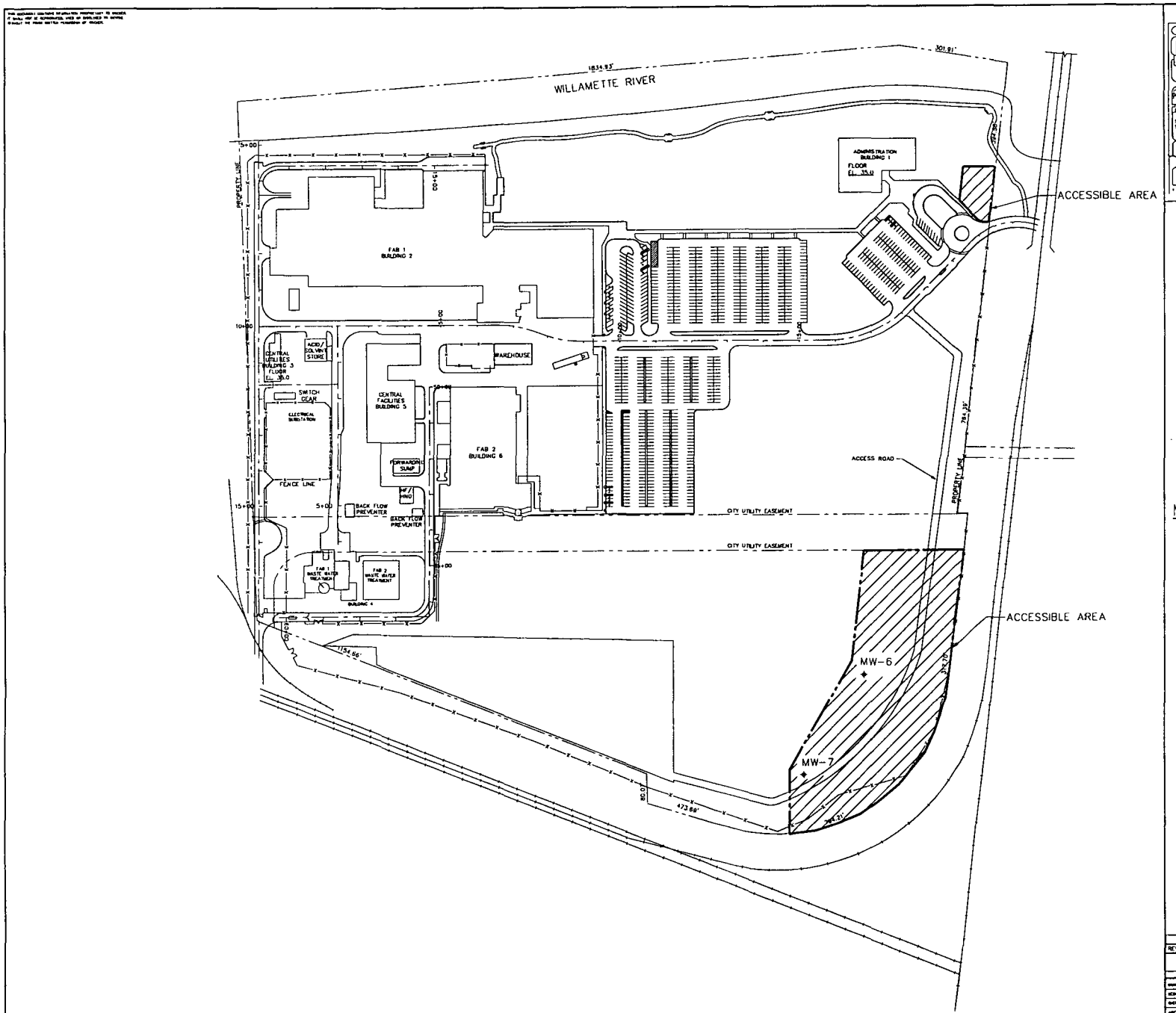
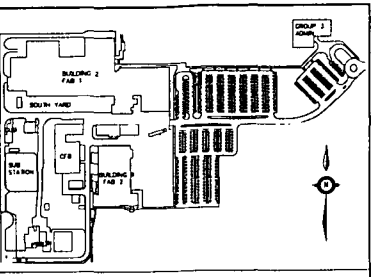
SCOEPA00009928

Exhibit A




MONITORING WELL COORDS.

| | NORTH | EAST | ELEV. |
|---|---|---|---|
| MW-6 | 9555.6 | 11688.4 | 35.67 |
| MW-7 | 9280.7 | 11521.4 | 36.37 |

REV. | DESC. | PROJ. NO. | BY | DATE | APP'D

Wacker Siltronic Corporation

WACKER

P.O. BOX 83180 PORTLAND, OREGON 97283-0180

SITE
CIVIL
ACCESSIBLE AREA

NTS

1C104

Thu Aug 26 16:16:10 1999 FINAL

SCOEPA00009929

FOR
SIGNATURE

cy

8/31

Nancy

Please forward to Cathryn ASAP.

Thanks,

Jen

MILLER | NASH

MILLER, NASH, WIENER, HAGER & CARLSEN LLP | ATTORNEYS AT LAW

**Miller, Nash, Wiener, Hager & Carlsen LLP**
3500 U.S. Bancorp Tower
111 S.W. Fifth Avenue
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4400 Two Union Square
601 Union Street
Seattle, WA 98101-2352
(206) 622-8484
(206) 622-7485 fax

www.millernash.com

**Jerry B. Hodson**
hodson@millernash.com
(503) 205-2335 direct line

August 30, 1999

**VIA MESSENGER**

Ms. Cathryn Young
Wacker Siltronics Corp.
7200 N.W. Front
Portland, Oregon 97210

Subject: Wacker Siltronic Corporation/Rhone-Poulenc Access Agreement

Dear Cathryn:

Enclosed are two duplicate originals of the access agreement for execution on behalf of Wacker. Please also have the signatory place his or her initials next to paragraph 10, line 2, page 5, where we have typed in the amount of attorney fees.

Please return the executed duplicate originals to our office. We will then forward them to Jim Benedict, counsel for Rhone-Poulenc, for execution by his client.

Very truly yours,

Jerry B. Hodson

FOR YOUR INFORMATION
JORDAN SCHRADER
3/12/02

# THIRD AMENDMENT TO ACCESS AGREEMENT

This Third Amendment to Access Agreement, made as of the 11th day of March, 2002, modifies the Access Agreement between Wacker Siltronic Corporation ("Wacker") and Rhône-Poulenc, Inc., now known as Aventis CropScience, U.S.A., LP ("Aventis/Rhône-Poulenc"), dated September 10, 1999, as previously amended by the First Amendment to Access Agreement, dated February 15, 2000, and the Second Amendment to Access Agreement, dated April 1, 2001 (collectively, the "Access Agreement").

## RECITALS

1. Wacker has provided access to Aventis/Rhône-Poulenc to the property for purposes of seasonal sampling and monitoring of existing groundwater wells on the property.

2. Aventis/Rhône-Poulenc seeks access to the property for purposes of sampling and analyzing water and sediment samples from the pond located on the property that receives overflow from North Doane Lake (hereinafter the "Pond"), periodically gauging the level of the Pond, and installing continuously logging flow meters on the culverts between North Doane Lake and the Pond, and between the Pond and the Willamette River. Aventis/Rhône-Poulenc requires periodic access to the flow meters to maintain and download the data from the flow meters. Aventis/Rhône-Poulenc will also require access to survey the location and elevation of the Pond and culverts and streambeds entering and exiting the Pond and other Pond features. In addition, Aventis/Rhône-Poulenc requires access to conduct a non-intrusive biological survey and subsequent collection of Pond organisms for tissue sampling.

3. Aventis/Rhône-Poulenc also seeks access to the property for purposes of installing a cluster of four groundwater monitoring wells (hereinafter "New Well Cluster"), surveying the location and elevation of each of the wells, periodically sampling the groundwater in the wells and periodically gauging the groundwater level in the wells.

4. Sampling and measurements relating to the Pond and the installation and sampling of the New Well Cluster will be conducted in accordance with the work plans entitled: Groundwater Transport Evaluation Data Needs Report Field Sampling Plan, RPAC - Portland Site (dated February 8, 2002), the Draft Remaining Remedial Investigation Work Plan prepared by AMEC Earth & Environmental, Inc., RPAC-Portland Site, dated December 6, 2001, the Spring 2002 Groundwater Characterization Field Sampling Plan dated March ____, 2002 and the Monitoring Well Installation at Wacker Property Field Sampling Plan dated February 28, 2002, which latter two work plans are subject to revision prior to final Oregon Department of Environmental Quality ("DEQ") approval, or such other field sampling plan or work plan approved by the DEQ and provided to Wacker no less than seven (7) days prior to the commencement of any work thereunder.

**AGREEMENT**

In consideration of the mutual covenants and promises contained herein, the Access Agreement is hereby amended as follows:

1. Paragraph 2 of the Access Agreement is amended to revise the first sentence of subparagraph 2.b. as follows:

"Rhône-Poulenc is authorized upon **72** hours advance notice to enter and remain on the Premises, between the hours of 8:00 a.m. and 7:00 p.m. on any day during the term of this Agreement for the purposes of conducting investigatory and monitoring Work (as hereinafter defined), subject to the terms and conditions set forth in this Agreement."

2. Paragraph 13 of the Access Agreement is amended to revise subparagraph 13.a. as follows and to add the following subparagraphs "b" and "c" at the end thereof:

"a. **Limited Access During Extended Term.** Notwithstanding the foregoing, and except as provided in paragraph 13.b. and 13.c., the access granted to Aventis/Rhône-Poulenc by Wacker during the Extended Term is for the purpose of sampling from and monitoring existing groundwater wells only. Except as provided in subparagraph 13.c, no new wells or additional sampling locations may be developed or installed by Aventis/Rhône-Poulenc on the Property during the Extended Term."

"b. **Limited Access for Sampling and Monitoring of Pond.** Wacker hereby grants Aventis/Rhône-Poulenc access to the property for purposes of sampling and analyzing water and sediment samples from the pond located on the property that receives overflow from North Doane Lake, hereinafter the "Pond,"

periodically gauging the level of the Pond, and installing continuously logging flow meters on the culvert between North Doane Lake and the Pond, and on the culvert between the Pond and the Willamette River. Wacker also grants access to the Property for Aventis/Rhône-Poulenc to maintain and download the data from the flow meters; to survey the location and elevation of the Pond and culverts and streambeds entering and exiting the Pond and other Pond features; and to conduct a non-intrusive biological survey and subsequent collection of Pond organisms for tissue sampling.

"**c. Limited Access for Sampling and Monitoring of New Well Cluster.** Wacker hereby grants Aventis/Rhône-Poulenc access to the property for purposes of installing the New Well Cluster, periodically sampling the groundwater in the wells in the New Well Cluster and periodically gauging the groundwater level in the wells in the New Well Cluster. Wacker hereby also grants Aventis/Rhône-Poulenc access to the property to survey the location and elevation of each of the wells in the New Well Cluster.

3. The Access Agreement is amended to add a new paragraph number 14 as follows:

"**14. Reservation of Rights.** Northwest Natural Gas Company and Wacker are conducting a remedial investigation of the Wacker property. Northwest Natural Gas Company is also conducting a remedial investigation of the Northwest Natural Gas property adjacent to the Wacker Property. By agreeing to install the well cluster on Wacker property at the direction of DEQ, Aventis/Rhône-Poulenc does not waive any rights or claims, and hereby reserves all rights as against Northwest Natural Gas Company, Wacker, the DEQ and all other parties for the cost of installation, surveying and sampling of the New Well Cluster.

4. All other terms of the Access Agreement, not inconsistent herewith, remain in full force and effect.

The parties have executed this Third Amendment to Access Agreement as of the date first set forth above.

AVENTIS CROPSCIENCE, U.S.A., LP
(formerly known as RHÔNE-POULENC, INC.)

DATE: 3/11/02

By: George A. Hoodwidge
Its: Assistant Secretary

WACKER SILTRONIC CORPORATION

DATE: 3/07/02

By: James R. Ellis
Its: PRES/CEO

COPY

# FIRST AMENDMENT TO ACCESS AGREEMENT

This Amendment ("First Amendment") made this 15th day of February ___, 2000, modifies the Access Agreement between Wacker Siltronic Corporation ("Wacker") and Rhône-Poulenc Ag Company ("Rhône-Poulenc") dated September 10, 1999 ("Access Agreement").

Recitals

1. Pursuant to the Access Agreement Wacker agreed to provide Rhône-Poulenc access to certain Wacker Premises for certain purposes described in the Access Agreement.

2. The Access Agreement allowed Rhône-Poulenc access to Existing Monitoring Wells on the Premises but did not allow Rhône-Poulenc to construct new monitoring wells on the Premises.

3. Wacker is now willing to authorize Rhône-Poulenc to construct new groundwater monitoring wells ("New Monitoring Wells") on the Premises and to permit Rhône-Poulenc and DEQ access to the Premises to install, develop, sample and monitor the New Monitoring Wells under the terms and conditions set forth in this First Amendment and the Access Agreement.

4. Wacker plans to regrade a portion of the area covered by the Access Agreement, as depicted on Figure 1 attached, for purposes of a wetlands mitigation project.

AGREEMENT

In consideration of mutual covenants and promises contained herein, the Access Agreement is hereby amended to include the provisions in this First Amendment. All



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other terms of the Access Agreement, not inconsistent herewith, remain in full force and effect.

13. Wacker hereby grants to Rhône-Poulenc, DEQ and their authorized representatives access to the Premises for the purpose of the installation, development, sampling and monitoring of the New Monitoring Wells, including the clearing of brush that may be necessary for installation to take place. The access shall be subject to all the terms and conditions of this First Amendment and the Access Agreement. The location of the New Monitoring Wells is depicted on Figure 1 attached. The New Monitoring Wells shall be constructed in accordance with the requirements of the plan, Early RI Activities – CPT, Geoprobe and Well Installation Field Sampling Plan (Final), RPAC – Portland Site, URS Greiner Woodward Clyde, July 7, 1999. The activities conducted pursuant to the foregoing work plan shall be deemed "Work" for purposes of the Access Agreement. The New Monitoring Wells shall be located and installed, and the Work performed, in such a manner so as not to interfere with or disrupt Wacker's regrading project.

14. Wacker shall have access to and may sample the New Monitoring Wells installed by Rhône-Poulenc. Rhône-Poulenc shall notify Wacker in writing at such time as any of the New Monitoring Wells installed by Rhône-Poulenc is no longer required by DEQ for Rhône-Poulenc's site investigation or long term groundwater monitoring. Following such notice, Rhône-Poulenc shall promptly decommission in accordance with applicable law at its expense, the New Monitoring Wells. If within thirty (30) days of Wacker's receipt of notice of proposed decommissioning, Wacker notifies Rhône-Poulenc that Wacker does not want Rhône-Poulenc to decommission the



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New Monitoring Wells, Rhône-Poulenc will be relieved of its responsibility to decommission the New Monitoring Wells.

15. Rhône-Poulenc and DEQ shall continue to have access to the Existing Monitoring Wells through the end of the term of the Access Agreement, September 30, 2000, unless earlier terminated pursuant to Paragraph 12 of the Access Agreement, but Rhône-Poulenc hereby acknowledges that after September 30, 2000, Wacker will decommission the Existing Monitoring Wells as part of its regrading project. After September 30, 2000, Rhône-Poulenc and DEQ shall have access to the Premises only for the purpose of the sampling and monitoring of the New Monitoring Wells, and such access shall terminate as soon as the New Monitoring Wells are no longer required by DEQ for Rhône-Poulenc's site investigation or long-term monitoring, and Rhône-Poulenc has decommissioned the New Monitoring Wells(unless relieved of this responsibility as provided in Paragraph 14), unless earlier terminated pursuant to Paragraph 12 of the Access Agreement.

16. In addition to the reimbursement required pursuant to paragraph 10 and in further consideration of Wacker granting access under this First Amendment, Rhône-Poulenc will pay to Wacker the sum of $500 to reimburse Wacker for attorneys' fees related to the preparation of this First Amendment. The attorneys' fees amount will be paid within 10 days after the date of this First Amendment.



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The parties have executed this First Amendment as of the date first set forth above.

RHÔNE-POULENC AG COMPANY

By: [signature]
Randy A. Jones

Its: Secretary

Date: 2/15/2000

WACKER SILTRONIC CORP.

By: [signature] for Jim Ellis

Its: Vice President of Operations

Date: 2/15/2000

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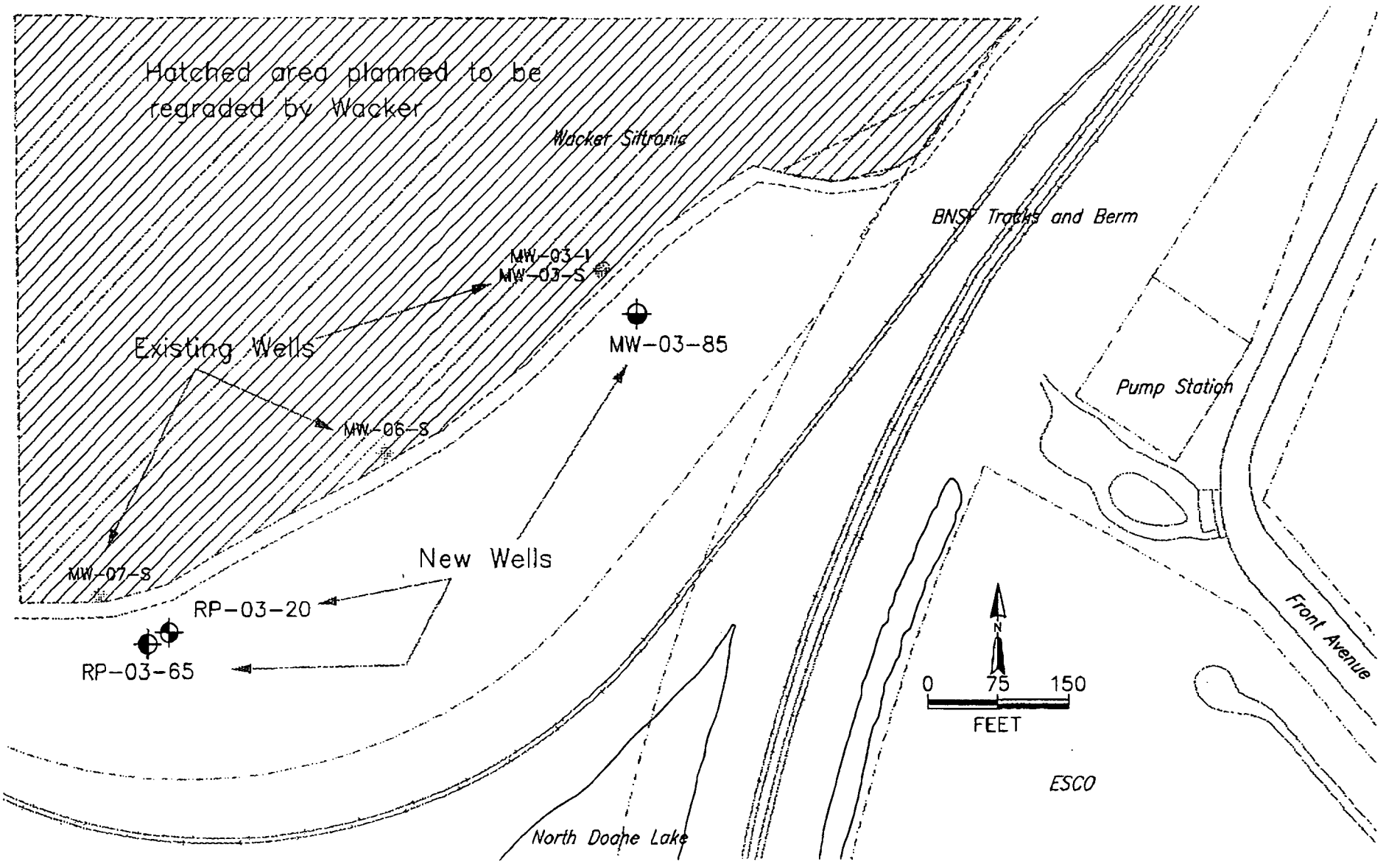


| | | | | | |
|---|---|---|---|---|---|
| **URSGWC** | TITLE: New Well Installations<br>Wacker Siltronic<br>Portland, OR | DWN: jgdp | DES.: | PROJECT NO.: 5292C0804A | |
| | | CHKD: | APPD: | | |
| | | DATE: 2/15/00 | REV.: 2 | FIGURE NO.: 1 | |

SCOEPA00009942

JORDAN SCHRADER
ATTORNEYS AT LAW

November 13, 2003

Cathryn Young
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland OR 97210

Re: **Access Agreement**
Wacker Siltronic Corporation/Rhone-Poulenc (Aventis CropScience USA, Inc.)
Our File No. 46454/30046

Dear Cathryn:

I have enclosed the original Access Agreement, dated October 27, 2003 between Wacker and StarLink Logistics Inc. for your records. I have retained a photocopy of the same for our file.

Jim Benedict indicated that he will send his client's check for the access fee in the amount of $1,388 directly to you, with a copy to me for our file.

Very truly yours,

JORDAN SCHRADER PC

Christopher L. Reive

Enclosure

**CHRISTOPHER L. REIVE**

*Admitted*
Oregon and Washington

*Direct Dial*
503.598.5544

*E-mail*
chris.reive@jordanschrader.com

# ACCESS AGREEMENT

This Access Agreement ("Agreement") is made this 27 day of October, 2003, between Wacker Siltronic Corporation ("Wacker"), and StarLink Logistics Inc. ("SLLI").

## RECITALS

**A.** Wacker is the owner of property located at 7200 Northwest Front Avenue in Portland, Oregon. This Agreement shall apply to that portion of the property identified by crosshatching on Exhibit "A" attached hereto ("Premises").

**B.** SLLI is the owner of property near the Premises, located at 6200 St. Helens Road in Portland, Oregon ("Portland Plant"). SLLI acquired the Portland Plant from Aventis CropScience USA, LP ("Aventis").

**C.** Monitoring wells ("Existing Monitoring Wells") currently exist on the Premises. The Existing Monitoring Wells, shown on Exhibit "A", include monitoring wells installed by Aventis under the Access Agreement between Aventis and Wacker dated September 10, 1999, as amended ("Aventis Access Agreement"). The monitoring wells installed by Aventis are referred to as the New Monitoring Wells and are so identified on Exhibit "A". The Aventis Access Agreement has terminated, but the agreement provides that obligations under the Aventis Access Agreement are continuing and survive the termination of the agreement.

**D.** SLLI desires access to the Premises for the purpose of complying with its obligations under a certain Administrative Order on Consent between SLLI and the Oregon Department of Environmental Quality ("DEQ"), DEQ No. WMCSR-NWR-99-07 ("DEQ Order").

**E.** DEQ desires access for the purpose of observing SLLI's investigation and monitoring activities.

**F.** Wacker is willing to permit SLLI and DEQ access to the Premises under the terms and conditions set forth in this Agreement.





SCOEPA00009944

## AGREEMENT

In consideration of the mutual covenants and promises contained herein, the parties agree as follows:

1. **Term of Agreement.** This Agreement shall begin on the effective date hereof and continue until terminated in accordance with Paragraph 14.

2. **Grant of Access to SLLI and DEQ.**

**a.** Wacker hereby grants to SLLI and DEQ, and their agents, employees, and contractors, access to the Premises, including ingress and egress as reasonably necessary to accomplish the purposes of this Agreement, subject to all the terms and conditions set forth in this Agreement; provided that without Wacker's prior written consent, which may be withheld or conditioned in its sole discretion, SLLI may only do the following on the Premises to the extent required under the Work Plans (as defined in subparagraph 2.d.) approved by DEQ: (i) investigate the Existing Monitoring Wells on the Premises, including but not limited to survey, sampling, and water level monitoring, and (ii) sampling and analyzing water and sediment samples from the pond located on the property that receives overflow from North Doane Lake, hereinafter the "Pond," periodically gauging the level of the Pond, and installing continuously logging flow meters on the culvert between North Doane Lake and the Pond, and on the culvert between the Pond and the Willamette River. Wacker also grants access to the Premises for SLLI to maintain and download the data from the flow meters; to survey the location and elevation of the Pond and culverts and streambeds entering and exiting the Pond and other Pond features; and to conduct a non-intrusive biological survey and subsequent collection of Pond organisms for tissue sampling. SLLI may not damage or obstruct any road, driveway, or other ingress/egress point to or on the Premises.

**b.** Wacker shall have access to and may sample the New Monitoring Wells installed by Aventis. SLLI shall notify Wacker in writing at such time as any of the New Monitoring Wells installed by Aventis is no longer required by DEQ for SLLI's site investigation or long term groundwater monitoring. Following such notice, SLLI shall promptly decommission in accordance with applicable law at its expense, the New Monitoring Wells. If within thirty (30) days of Wacker's receipt of notice of proposed decommissioning, Wacker



SCOEPA00009945

notifies SLLI that Wacker does not want SLLI to decommission the New Monitoring Wells, SLLI will relinquish its ownership of the New Monitoring Wells and SLLI and Aventis will be relieved of its responsibility to decommission the New Monitoring Wells. SLLI and Wacker will execute such documents as are necessary to convey, and to memorialize the conveyance of, the New Monitoring Wells.

**c.** SLLI is authorized upon 72 hours advance notice to enter and remain on the Premises, between the hours of 8:00 a.m. and 5:00 p.m. on any Monday through Friday during the term of this Agreement for the purposes of conducting investigatory and monitoring work (as hereinafter defined), subject to the terms and conditions set forth in this Agreement. A representative of Wacker may (but is not required to) observe and monitor all activities conducted by or on behalf of SLLI under this Agreement. The Work to be conducted by SLLI will be described in a work plan approved by DEQ. Each such work plan will be provided to Wacker at least fourteen (14) days prior to SLLI's entry to the Premises. For the purposes of this Agreement, the term "Work Plans" shall mean each work plan approved by DEQ and provided to Wacker.

The following Work Plan has been provided previously to Wacker:

(1) "Draft North Doane Lake Field Sampling Plan", prepared for SLLI by AMEC Earth and Environmental, Inc., dated May 7, 2003, with changes as documented in correspondence dated July 1, 2003 (DEQ), July 10, 2003 (AMEC) and July 22, 2003 (DEQ).

The activities described in the Work Plans to be conducted on the Premises shall be referred to herein as the "Work." The Work to be performed by SLLI shall be conducted, to the maximum extent possible, without disruption of or interference with the use of the Premises by Wacker, its agents, assigns, or successors.

**d.** SLLI shall (i) have all Work performed in a good and workmanlike manner; (ii) timely pay for all Work; (iii) keep the Premises free and clear of all mechanic's liens and other encumbrances; (iv) promptly repair any damage caused by its access to the Premises; and (v) cause no release of any hazardous materials on the Premises or other environmental damage or deterioration to any portion of the Premises; and (vi) at all times while on the

Premises comply with all applicable federal, state, local laws and regulations, including (without limitation) the DEQ Order.

3. **Authorized Representatives.** As used in this Agreement, the terms SLLI, Wacker, and DEQ include their respective employees, agents, authorized representatives, contractors, and subcontractors, retained either directly or indirectly.

4. **Results of Sampling and Analysis.** SLLI shall promptly provide to Wacker a copy of the reports submitted to DEQ of the test results obtained from sampling and monitoring activities conducted on the Premises. Upon written request by Wacker, SLLI will provide a copy of all QA/QC documentation.

5. **Sampling Procedures and Duplicate Samples.** All samples and analyses shall meet the requirements specified in the Work Plans. At the request of Wacker, SLLI will provide Wacker the opportunity to obtain, at Wacker's expense, split or duplicate samples of any samples collected by SLLI from the Premises. The SLLI analyses shall be limited to the constituents identified in the Work Plans.

6. **Proper Disposal.** SLLI shall be responsible for proper procedures applicable to generation, storage, and disposal of any waste, including drill cuttings, purge volumes, and decontamination fluids and materials generated by its sampling ("Investigation Derived Waste" or "IDW"). SLLI may store drums of IDW temporarily on the premises for so long as reasonably necessary to arrange for transportation off the Premises but in no event shall SLLI store any drum on the Premises longer than 48 hours.

7. **Survival of Covenants.** The obligations of this Agreement shall be continuing and shall survive the termination hereof.

8. **Nonacquiescence.** The execution of this Agreement shall not be construed or deemed an acquiescence in or acknowledgement of any right by SLLI or any other person to access to the Premises, nor an acceptance of the adequacy or sufficiency of the results of sampling or any conclusion or recommendation based upon the sampling.

9. **Indemnity.** SLLI shall defend, indemnify, and hold Wacker free and harmless from any and all claims, demands, actions, suits, damages, costs, penalties, fines, or expenses (including reasonable attorney, engineering, and other professional or expert fees) arising out of or related to the access to or activities on the Premises by or caused by any act or omission of SLLI, its agents, employees, subcontractors, or any other person acting on SLLI's behalf (hereinafter "Claim") except to the extent due to the negligent, willful, or unlawful acts or omissions of Wacker. In the event of any negligent, willful, or unlawful act or omission of Wacker that occurs in combination with any conduct or omission of SLLI, its agents, employees, or subcontractors or any other person acting on SLLI's behalf that would otherwise give rise to a Claim, SLLI shall indemnify Wacker except for that percentage of the damage for which Wacker is shown to be responsible under this Section. Both parties shall provide the other party with prompt written notice of any Claim which comes to the attention of such party. SLLI, SLLI's contractors (including AMEC Earth & Environmental, Inc. ("AMEC"), and any other person accessing the Premises on behalf of SLLI will be covered at all times by a current broad form comprehensive general liability policy covering bodily injury and property damage in an amount of not less than $10 million, excess liability coverage in an amount of not less than $10 million and pollution liability in an amount of not less than $10 million, and shall upon written request provide Wacker with a certificate or certificates evidencing such coverage during the time that this Agreement is effective. Wacker will be named as an additional insured with respect to all such insurance policies

10. **Access Fee.** In consideration of Wacker granting access to SLLI under this Agreement, SLLI will pay to Wacker the sum of $1,388.00 to reimburse Wacker for attorneys' fees related to the preparation of this Agreement. The attorneys' fees amount will be paid within ten (10) days after the date of this Agreement. In addition, SLLI will pay Wacker's reasonable incremental out-of-pocket costs incurred by Wacker as a result of SLLI's entry and conduct of the Work on the Premises including, without limitation, additional security measures, monitoring and oversight of the Work. Wacker shall provide SLLI a detailed statement of the out-of-pocket costs incurred by Wacker following the completion of the Work. Upon written request by SLLI, Wacker will provide documentation to support Wacker's statement of out-of-pocket costs incurred. The out-of-pocket costs shall be payable within thirty (30) days of SLLI's receipt of the statement of costs or receipt of the supporting documentation, if requested.

11. **Notice.** Notices shall be delivered in person, by facsimile to the following facsimile number or mailed to the following address and to the attention of the person specified below:

To Wacker:

Cathryn Young
Wacker Siltronic Corporation
P.O. Box 83180
Portland, OR 97283-0180
Fax: (503) 241-7599

To SLLI:

Robert L. Ferguson
StarLink Logistics Inc.
One Copley Parkway, Suite 309
Morrisville, NC 27560
Fax: (919) 678-6069

12. **Future.** In the event SLLI, or any of its employees, agents, contractors or consultants acquires actual knowledge that any of the Existing Monitoring Wells has failed or been damaged so as to cause a release or migration of hazardous substances on or under the Premises, SLLI shall notify Wacker as soon as practicable of that condition. In the event that Wacker, without notice from SLLI, reasonably believes that any of the Existing Monitoring Wells as a result of the negligent acts or omissions of SLLI or any of its employees, agents, contractors, or consultants, has failed, been damaged or has caused a release or threatened release which has caused or may cause a significant adverse effect on the beneficial use of the water, as defined by Oregon law, on or under the Premises after notice to SLLI and failure by SLLI to promptly, as dictated by the circumstances, take response action, Wacker may take such action as is reasonably necessary to repair or abandon the failed or damaged well or stop the release without any obligation on the part of Wacker to reinstall or replace the well. In this event, Wacker may recover from SLLI and SLLI hereby agrees to pay to Wacker its reasonable costs and fees incurred in such a response, and to indemnify Wacker for all damages caused by such failure or damage to the well or any such release. Nothing herein otherwise changes SLLI's obligations to indemnify, defend, or reimburse Wacker for damages and costs described in this Agreement.



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13. **Reservation of Rights.** Northwest Natural Gas Company and Wacker are conducting a remedial investigation of the Wacker property. Northwest Natural Gas Company is also conducting a remedial investigation of the Northwest Natural Gas property adjacent to the Wacker Property. SLLI does not waive any rights or claims, and hereby reserves all rights as against Northwest Natural Gas Company, Wacker, the DEQ and all other parties for the cost of installation, surveying and sampling of monitoring wells numbered RP-07-30, RP-07-55, RP-07-84, and RP-07-119.

14. **Termination.** This Agreement shall be revocable at will by either party upon written notice to the other party.

The parties have executed this Agreement as of the date first set forth above.

**STARLINK LOGISTICS INC.**

By: _____
Its: PRESIDENT

**WACKER SILTRONIC CORPORATION**

By: _____
Its: PRESIDENT & CEO





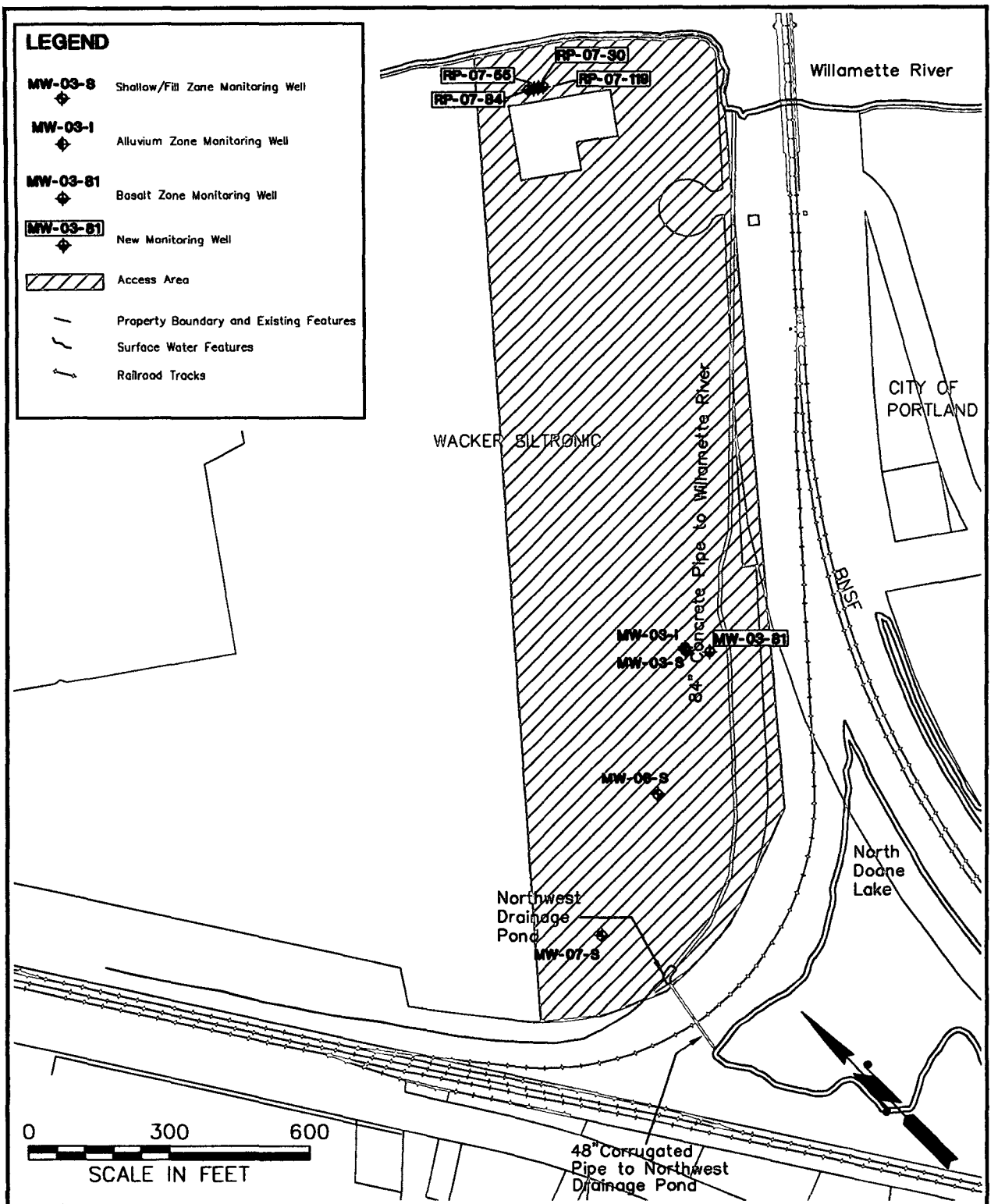
SCOEPA00009950

**EXHIBIT "A"**





SCOEPA00009951




amec

7376 SW Durham Road
Portland, OR, U.S.A. 97224

| | |
|---|---|
| W.O. | 0-61M-10703-0 |
| DESIGN | LF |
| DRAWN | BRJ |
| DATE | SEPTEMBER 2003 |
| SCALE | 1"=300' |

**EXHIBIT A**

**EXISTING MONITORING WELLS**
**WACKER PROPERTY**

AMEC DRAWING NO. K:\10000\10700\10703\Task 43 Groundwater Monitoring\dwg\Wacker Wells.dwg

SCOEPA00009952

CABLE HUSTON BENEDICT HAAGENSEN & LLOYD LLP
ATTORNEYS AT LAW
SUITE 2000
1001 SW FIFTH AVENUE
PORTLAND, OREGON 97204-1136

TELEPHONE (503) 224-3092
FACSIMILE (503) 224-3176

JAMES E. BENEDICT
email address: jbenedic@chbh.com

11.7.03 AMS
FOR YOUR INFORMATION
JORDAN SCHRADER

November 6, 2003

Christopher L. Reive
Jordan Schrader, PC
P.O. Box 230669
Portland, OR 97281

**Re: Wacker/SLLI Access Agreement**
Our File No. 22501.002

Dear Chris:

Enclosed for your records is a fully executed original of the Access Agreement between Wacker Siltronic Corporation and StarLink Logistics Inc.

If you have any questions, please call.

Very truly yours,

James E. Benedict

JEB/rls
Enclosure

cc: Bob Ferguson (w/o enc)
Roger Gresh (w/enc)

M:\RS\JEB\22501\002\LETTERS\LTR-REIVE-0014.doc



SCOEPA00009953

## ACCESS AGREEMENT

This Access Agreement ("Agreement") is made this 27 day of October, 2003, between Wacker Siltronic Corporation ("Wacker"), and StarLink Logistics Inc. ("SLLI").

## RECITALS

**A.** Wacker is the owner of property located at 7200 Northwest Front Avenue in Portland, Oregon. This Agreement shall apply to that portion of the property identified by crosshatching on Exhibit "A" attached hereto ("Premises").

**B.** SLLI is the owner of property near the Premises, located at 6200 St. Helens Road in Portland, Oregon ("Portland Plant"). SLLI acquired the Portland Plant from Aventis CropScience USA, LP ("Aventis").

**C.** Monitoring wells ("Existing Monitoring Wells") currently exist on the Premises. The Existing Monitoring Wells, shown on Exhibit "A", include monitoring wells installed by Aventis under the Access Agreement between Aventis and Wacker dated September 10, 1999, as amended ("Aventis Access Agreement"). The monitoring wells installed by Aventis are referred to as the New Monitoring Wells and are so identified on Exhibit "A". The Aventis Access Agreement has terminated, but the agreement provides that obligations under the Aventis Access Agreement are continuing and survive the termination of the agreement.

**D.** SLLI desires access to the Premises for the purpose of complying with its obligations under a certain Administrative Order on Consent between SLLI and the Oregon Department of Environmental Quality ("DEQ"), DEQ No. WMCSR-NWR-99-07 ("DEQ Order").

**E.** DEQ desires access for the purpose of observing SLLI's investigation and monitoring activities.

**F.** Wacker is willing to permit SLLI and DEQ access to the Premises under the terms and conditions set forth in this Agreement.

## AGREEMENT

In consideration of the mutual covenants and promises contained herein, the parties agree as follows:

1. **Term of Agreement.** This Agreement shall begin on the effective date hereof and continue until terminated in accordance with Paragraph 14.

2. **Grant of Access to SLLI and DEQ.**

**a.** Wacker hereby grants to SLLI and DEQ, and their agents, employees, and contractors, access to the Premises, including ingress and egress as reasonably necessary to accomplish the purposes of this Agreement, subject to all the terms and conditions set forth in this Agreement; provided that without Wacker's prior written consent, which may be withheld or conditioned in its sole discretion, SLLI may only do the following on the Premises to the extent required under the Work Plans (as defined in subparagraph 2.d.) approved by DEQ: (i) investigate the Existing Monitoring Wells on the Premises, including but not limited to survey, sampling, and water level monitoring, and (ii) sampling and analyzing water and sediment samples from the pond located on the property that receives overflow from North Doane Lake, hereinafter the "Pond," periodically gauging the level of the Pond, and installing continuously logging flow meters on the culvert between North Doane Lake and the Pond, and on the culvert between the Pond and the Willamette River. Wacker also grants access to the Premises for SLLI to maintain and download the data from the flow meters; to survey the location and elevation of the Pond and culverts and streambeds entering and exiting the Pond and other Pond features; and to conduct a non-intrusive biological survey and subsequent collection of Pond organisms for tissue sampling. SLLI may not damage or obstruct any road, driveway, or other ingress/egress point to or on the Premises.

**b.** Wacker shall have access to and may sample the New Monitoring Wells installed by Aventis. SLLI shall notify Wacker in writing at such time as any of the New Monitoring Wells installed by Aventis is no longer required by DEQ for SLLI's site investigation or long term groundwater monitoring. Following such notice, SLLI shall promptly decommission in accordance with applicable law at its expense, the New Monitoring Wells. If within thirty (30) days of Wacker's receipt of notice of proposed decommissioning, Wacker



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notifies SLLI that Wacker does not want SLLI to decommission the New Monitoring Wells, SLLI will relinquish its ownership of the New Monitoring Wells and SLLI and Aventis will be relieved of its responsibility to decommission the New Monitoring Wells. SLLI and Wacker will execute such documents as are necessary to convey, and to memorialize the conveyance of, the New Monitoring Wells.

**c.** SLLI is authorized upon 72 hours advance notice to enter and remain on the Premises, between the hours of 8:00 a.m. and 5:00 p.m. on any Monday through Friday during the term of this Agreement for the purposes of conducting investigatory and monitoring work (as hereinafter defined), subject to the terms and conditions set forth in this Agreement. A representative of Wacker may (but is not required to) observe and monitor all activities conducted by or on behalf of SLLI under this Agreement. The Work to be conducted by SLLI will be described in a work plan approved by DEQ. Each such work plan will be provided to Wacker at least fourteen (14) days prior to SLLI's entry to the Premises. For the purposes of this Agreement, the term "Work Plans" shall mean each work plan approved by DEQ and provided to Wacker.

The following Work Plan has been provided previously to Wacker:

(1) "Draft North Doane Lake Field Sampling Plan", prepared for SLLI by AMEC Earth and Environmental, Inc., dated May 7, 2003, with changes as documented in correspondence dated July 1, 2003 (DEQ), July 10, 2003 (AMEC) and July 22, 2003 (DEQ).

The activities described in the Work Plans to be conducted on the Premises shall be referred to herein as the "Work." The Work to be performed by SLLI shall be conducted, to the maximum extent possible, without disruption of or interference with the use of the Premises by Wacker, its agents, assigns, or successors.

**d.** SLLI shall (i) have all Work performed in a good and workmanlike manner; (ii) timely pay for all Work; (iii) keep the Premises free and clear of all mechanic's liens and other encumbrances; (iv) promptly repair any damage caused by its access to the Premises; and (v) cause no release of any hazardous materials on the Premises or other environmental damage or deterioration to any portion of the Premises; and (vi) at all times while on the



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Premises comply with all applicable federal, state, local laws and regulations, including (without limitation) the DEQ Order.

3. **Authorized Representatives.** As used in this Agreement, the terms SLLI, Wacker, and DEQ include their respective employees, agents, authorized representatives, contractors, and subcontractors, retained either directly or indirectly.

4. **Results of Sampling and Analysis.** SLLI shall promptly provide to Wacker a copy of the reports submitted to DEQ of the test results obtained from sampling and monitoring activities conducted on the Premises. Upon written request by Wacker, SLLI will provide a copy of all QA/QC documentation.

5. **Sampling Procedures and Duplicate Samples.** All samples and analyses shall meet the requirements specified in the Work Plans. At the request of Wacker, SLLI will provide Wacker the opportunity to obtain, at Wacker's expense, split or duplicate samples of any samples collected by SLLI from the Premises. The SLLI analyses shall be limited to the constituents identified in the Work Plans.

6. **Proper Disposal.** SLLI shall be responsible for proper procedures applicable to generation, storage, and disposal of any waste, including drill cuttings, purge volumes, and decontamination fluids and materials generated by its sampling ("Investigation Derived Waste" or "IDW"). SLLI may store drums of IDW temporarily on the premises for so long as reasonably necessary to arrange for transportation off the Premises but in no event shall SLLI store any drum on the Premises longer than 48 hours.

7. **Survival of Covenants.** The obligations of this Agreement shall be continuing and shall survive the termination hereof.

8. **Nonacquiescence.** The execution of this Agreement shall not be construed or deemed an acquiescence in or acknowledgement of any right by SLLI or any other person to access to the Premises, nor an acceptance of the adequacy or sufficiency of the results of sampling or any conclusion or recommendation based upon the sampling.

9. **Indemnity.** SLLI shall defend, indemnify, and hold Wacker free and harmless from any and all claims, demands, actions, suits, damages, costs, penalties, fines, or expenses (including reasonable attorney, engineering, and other professional or expert fees) arising out of or related to the access to or activities on the Premises by or caused by any act or omission of SLLI, its agents, employees, subcontractors, or any other person acting on SLLI's behalf (hereinafter "Claim") except to the extent due to the negligent, willful, or unlawful acts or omissions of Wacker. In the event of any negligent, willful, or unlawful act or omission of Wacker that occurs in combination with any conduct or omission of SLLI, its agents, employees, or subcontractors or any other person acting on SLLI's behalf that would otherwise give rise to a Claim, SLLI shall indemnify Wacker except for that percentage of the damage for which Wacker is shown to be responsible under this Section. Both parties shall provide the other party with prompt written notice of any Claim which comes to the attention of such party. SLLI, SLLI's contractors (including AMEC Earth & Environmental, Inc. ("AMEC"), and any other person accessing the Premises on behalf of SLLI will be covered at all times by a current broad form comprehensive general liability policy covering bodily injury and property damage in an amount of not less than $10 million, excess liability coverage in an amount of not less than $10 million and pollution liability in an amount of not less than $10 million, and shall upon written request provide Wacker with a certificate or certificates evidencing such coverage during the time that this Agreement is effective. Wacker will be named as an additional insured with respect to all such insurance policies

10. **Access Fee.** In consideration of Wacker granting access to SLLI under this Agreement, SLLI will pay to Wacker the sum of $1,388.00 to reimburse Wacker for attorneys' fees related to the preparation of this Agreement. The attorneys' fees amount will be paid within ten (10) days after the date of this Agreement. In addition, SLLI will pay Wacker's reasonable incremental out-of-pocket costs incurred by Wacker as a result of SLLI's entry and conduct of the Work on the Premises including, without limitation, additional security measures, monitoring and oversight of the Work. Wacker shall provide SLLI a detailed statement of the out-of-pocket costs incurred by Wacker following the completion of the Work. Upon written request by SLLI, Wacker will provide documentation to support Wacker's statement of out-of-pocket costs incurred. The out-of-pocket costs shall be payable within thirty (30) days of SLLI's receipt of the statement of costs or receipt of the supporting documentation, if requested.

**11. Notice.** Notices shall be delivered in person, by facsimile to the following facsimile number or mailed to the following address and to the attention of the person specified below:

To Wacker:

Cathryn Young
Wacker Siltronic Corporation
P.O. Box 83180
Portland, OR 97283-0180
Fax: (503) 241-7599

To SLLI:

Robert L. Ferguson
StarLink Logistics Inc.
One Copley Parkway, Suite 309
Morrisville, NC 27560
Fax: (919) 678-6069

**12. Future.** In the event SLLI, or any of its employees, agents, contractors or consultants acquires actual knowledge that any of the Existing Monitoring Wells has failed or been damaged so as to cause a release or migration of hazardous substances on or under the Premises, SLLI shall notify Wacker as soon as practicable of that condition. In the event that Wacker, without notice from SLLI, reasonably believes that any of the Existing Monitoring Wells as a result of the negligent acts or omissions of SLLI or any of its employees, agents, contractors, or consultants, has failed, been damaged or has caused a release or threatened release which has caused or may cause a significant adverse effect on the beneficial use of the water, as defined by Oregon law, on or under the Premises after notice to SLLI and failure by SLLI to promptly, as dictated by the circumstances, take response action, Wacker may take such action as is reasonably necessary to repair or abandon the failed or damaged well or stop the release without any obligation on the part of Wacker to reinstall or replace the well. In this event, Wacker may recover from SLLI and SLLI hereby agrees to pay to Wacker its reasonable costs and fees incurred in such a response, and to indemnify Wacker for all damages caused by such failure or damage to the well or any such release. Nothing herein otherwise changes SLLI's obligations to indemnify, defend, or reimburse Wacker for damages and costs described in this Agreement.



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13. **Reservation of Rights.** Northwest Natural Gas Company and Wacker are conducting a remedial investigation of the Wacker property. Northwest Natural Gas Company is also conducting a remedial investigation of the Northwest Natural Gas property adjacent to the Wacker Property. SLLI does not waive any rights or claims, and hereby reserves all rights as against Northwest Natural Gas Company, Wacker, the DEQ and all other parties for the cost of installation, surveying and sampling of monitoring wells numbered RP-07-30, RP-07-55, RP-07-84, and RP-07-119.

14. **Termination.** This Agreement shall be revocable at will by either party upon written notice to the other party.

The parties have executed this Agreement as of the date first set forth above.

**STARLINK LOGISTICS INC.**

By: _____
Its: PRESIDENT

**WACKER SILTRONIC CORPORATION**

By: _____
Its: PRESIDENT & CEO





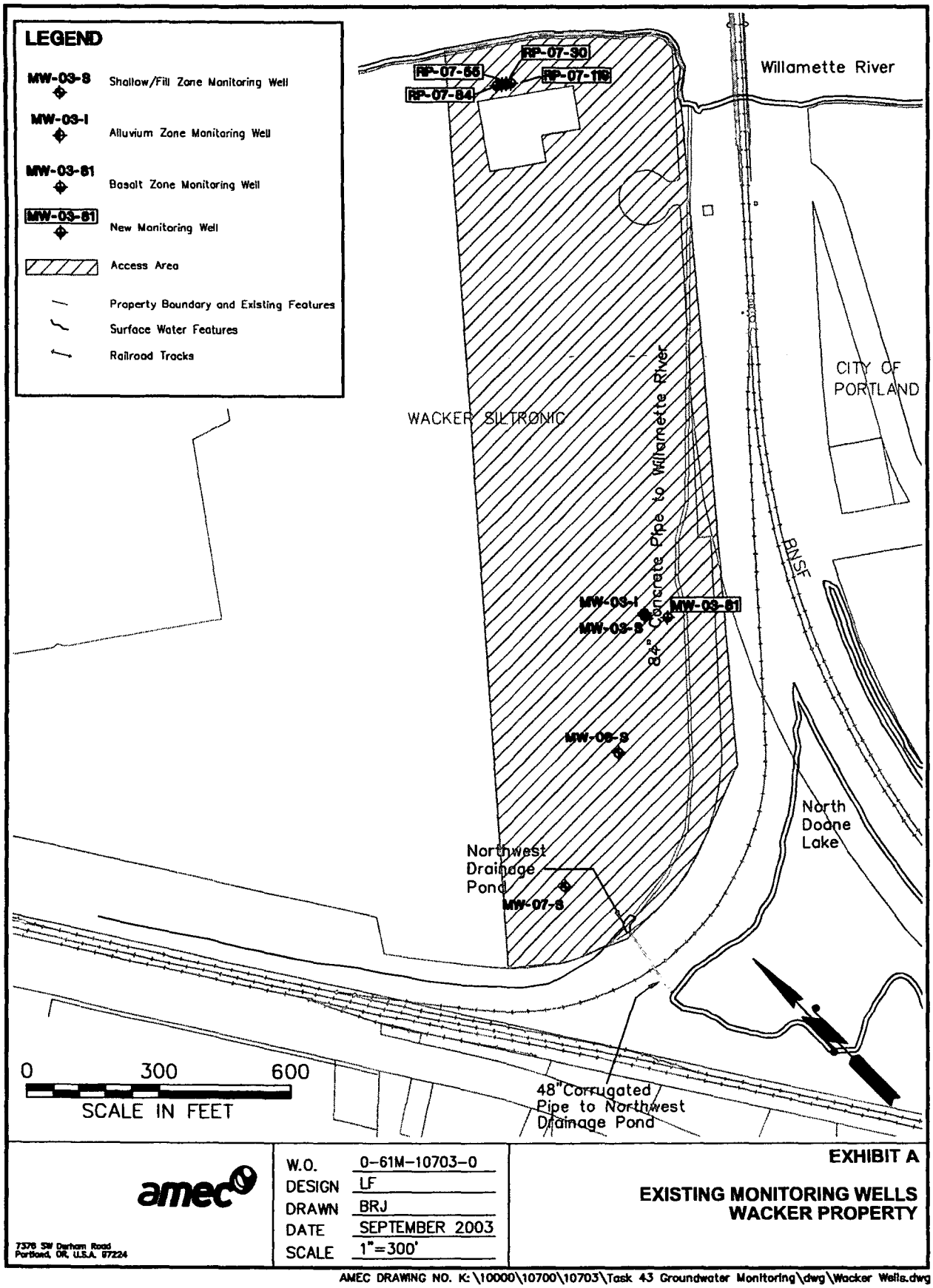
SCOEPA00009960

**EXHIBIT "A"**





SCOEPA00009961




amec

7376 SW Durham Road
Portland, OR, U.S.A. 97224

| | |
|---|---|
| W.O. | 0-61M-10703-0 |
| DESIGN | LF |
| DRAWN | BRJ |
| DATE | SEPTEMBER 2003 |
| SCALE | 1"=300' |

**EXHIBIT A**

**EXISTING MONITORING WELLS**
**WACKER PROPERTY**

AMEC DRAWING NO. K:\10000\10700\10703\Task 43 Groundwater Monitoring\dwg\Wacker Wells.dwg

SCOEPA00009962

# LETTER OF TRANSMITTAL

**TO:**

| | |
|---|---|
| Wacker Siltronic Corporation<br>7200 NW Front Avenue<br>Portland, OR 97210 | Date: April 18, 2003 |
| | Job No: 0-61M-10703-0/Task 15 |
| | Attn: Cathryn Young |
| | RE: RPAC - Portland Site |

**WE ARE SENDING YOU:** ☐ Attached ☒ Under Separate Cover via US Mail

| Copies | Dated | Description |
|---|---|---|
| 1 | 4/10/03 | Quarterly Progress Report |
| | | |
| | | |
| | | |

**THESE ARE TRANSMITTED** as checked below:

☐ For Review ☐ For Approval ☒ For Your Use ☐ As Requested

**REMARKS:**

AMEC Earth & Environmental, Inc.
7376 SW Durham Road
Portland, Oregon
USA 97224
Tel +1 (503) 639-3400
Fax +1 (503) 620-7892

April 10, 2003

0-61M-10703-0/Task 15

Thomas E. Roick
Cleanup/Portland Harbor
Department of Environmental Quality
2020 SW 4th Avenue, Suite 400
Portland, Oregon 97201-4987

Dear Mr. Roick:

**Re: Quarterly Progress Report for RI/FS**
**RPAC - Portland Site**
**First Quarter, 2003**

On behalf of RPAC, AMEC Earth & Environmental, Inc. (AMEC) is submitting three copies of the First Quarter, 2003 Progress Report as required by the July 1999 Consent Order. One additional copy will be sent directly to Mavis Kent of DEQ, per DEQ's request. Introduction

On behalf of RPAC, AMEC has prepared this Quarterly Progress Report for Remedial Investigation/Feasibility Study (RI/FS) activities associated with the RPAC Portland Site. This report covers activities conducted during the first calendar quarter of year 2003 (January 1, 2003 through March 31, 2003), and is prepared as specified by the Consent Order (No. WMCSR-NWR-99-07) executed between RPAC and the Oregon Department of Environmental Quality (DEQ) in July 1999 (the Order).

## CURRENT REPORTING ACTIVITIES

### Groundwater Characterization Report

The Final Groundwater Characterization Report (GCR) and the Draft Post-Characterization Groundwater Monitoring Plan for the RPAC Portland Site were submitted to the DEQ on March 28, 2003.

### Granulated Activated Carbon Replacement

A letter describing the disposal of spent carbon was submitted to DEQ on January 6, 2003. RPAC requested a 30-day extension of the 90-day storage requirement in a letter dated January 15, 2003 and DEQ approved the extension in a letter dated January 24, 2003. As requested by DEQ, a letter concerning Waste Codes Applicable to Spent Granular Activated Carbon Generated at the RPAC Site was forwarded to DEQ on February 3, 2003. RPAC requested a second 30-day extension of the 90-day storage requirement in a letter dated February 11, 2003 and DEQ approved the extension in a letter dated February 19, 2003. RPAC requested a third 30-day extension of the 90-day storage requirement on March 18, 2003 and DEQ approved the extension in a letter dated March 31, 2003.



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**Source Area Soils Characterization**

The Final Source Area Soils Characterization Report for the RPAC Portland Site was submitted to DEQ on March 3, 2003.

**Investigative-Derived Waste (IDW) Disposal**

No IDW was disposed during the first quarter of 2003.

**Significant Problems Encountered**

No significant problems were encountered during this current reporting period.

**Activities Planned for the Next Reporting Period**

The activities currently planned for the next quarterly reporting period (Second Quarter 2003) include the following (not in chronological order)

- Submittal of the Bioremediation Evaluation Work Plan;
- Submittal of the Lake Area Geophysical Survey Work Plan;
- Submittal of the Facility Structure IRAM Work Plan;
- Submittal of the Non-Aqueous Phase Liquid Evaluation Work Plan;
- Submittal of the North Doane Lake Level II Aquatic Ecological Risk Assessment Field Sampling Plan;
- Meet with DEQ to discuss to ERA for North Doane Lake; and
- Initiate the North Doane Lake/West Doane Lake Groundwater Modeling.
- If you have any questions, please call Roger Gresh at (503) 639-3400.

Sincerely,

**AMEC Earth & Environmental, Inc.**

Scott Kranz R.G.
Senior Hydrogeologist

Roger Gresh, P.G.
Project Manager

SK/lp



SCOEPA00009965

c: R. Ferguson, SLLI
J. Benedict, CHBH&L
M. Kent, DEQ - NW Region
D. Blount, CLB&W
K. McCaw, ESCO Corp.
E. McDaniel, SMR&H
B. Sheppard, BNSF
C. Young, Wacker Siltronic Corporation
L. Patterson, ATOFINA North America, Inc.
I. Dubrow Davidson, Schnitzer Investment Corp.
J. Baird, Air Liquide America Corp.



SCOEPA00009966

# LETTER OF TRANSMITTAL

**TO:**

| | |
|---|---|
| Wacker Siltronic Corporation<br>7200 NW Front Avenue<br>Portland, OR 97210 | Date: July 10, 2003 |
| | Job No: 0-61M-10703-0/Task 15 |
| | Attn: Cathryn Young |
| | RE: RP - Portland Site |

**WE ARE SENDING YOU:** ☐ Attached ☒ Under Separate Cover via US Mail

| Copies | Dated | Description |
|---|---|---|
| 1 | 7/10/03 | Quarterly Progress Report for RI/FS |
| | | |
| | | |
| | | |

**THESE ARE TRANSMITTED** as checked below:

☐ For Review ☐ For Approval ☒ For Your Use ☐ As Requested

**REMARKS:**

AMEC Earth & Environmental, Inc.
7376 SW Durham Road
Portland, Oregon
USA 97224
Tel +1 (503) 639-3400
Fax +1 (503) 620-7892

July 10, 2003

0-61M-10703-0/Task 15

Thomas E. Roick
Project Manager, Cleanup & Portland Harbor
Department of Environmental Quality
2020 SW 4th Avenue, Suite 400
Portland, Oregon 97201-4987

Dear Mr. Roick:

**Re: Quarterly Progress Report for RI/FS**
**RP - Portland Site**
**Second Quarter 2003**

On behalf of Rhone-Poulenc (RP), AMEC Earth and Environmental, Inc. (AMEC) is submitting to the Oregon Department of Environmental Quality (DEQ) three copies of the Second Quarter, 2003 Progress Report associated with the Remedial Investigation/Feasibility Study (RI/FS) at the RP Portland Site. One additional copy will be sent directly to Mavis Kent of DEQ, per DEQ's request. This quarterly report includes activities conducted during the second calendar quarter of year 2003 (April 1, 2003 through June 30, 2003), and is prepared as specified by the Consent Order (No. WMCSR-NWR-99-07) executed between RP and the DEQ in July 1999 (the Order).

## CURRENT REPORTING ACTIVITIES

RP provided the new DEQ project manager an overview of the RP Site remedial investigation/feasibility study (RI/FS) during a meeting on April 3, 2003. The meeting discussions were summarized in a letter submitted to DEQ May 5, 2003.

### North Doane Lake Sampling

A teleconference was held with DEQ on April 21, 2003 to discuss the scope and objectives of the North Doane Lake (NDL) ecological risk assessment sampling. The Draft NDL Field Sampling Plan was submitted to DEQ on May 7, 2003. The Draft Quality Assurance Project Plan Addendum No. 2 was submitted to DEQ on June 23, 2003.

### Source Area Investigation

The Draft Lake Area Geophysical Survey Work Plan was submitted to DEQ on June 4, 2003.

### Non-Aqueous Phase Liquid (NAPL) Evaluation

The Draft Non-Aqueous Phase Liquid (NAPL) Evaluation Work Plan was submitted to DEQ on June 30, 2003.

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amec

**Granulated Activated Carbon Disposal**

The approval to dispose spent granular activated (GAC) under the CAMU-eligible waste rule (40 CFR 264.552) was granted by the DEQ on April 4, 2003. On April 21, 22, and 23, four shipments of spent GAC totaling 37.17 tons were transported to the Chemical Waste Management of the Northwest Subtitle C facility in Arlington, Oregon. The spent GAC material was macroencapsulated prior to placement in the landfill.

**Investigative-Derived Waste (IDW) Disposal**

No IDW was disposed during the second quarter of 2003.

**Significant Problems Encountered**

No significant problems were encountered during this current reporting period.

**Activities Planned for the Next Reporting Period**

The activities currently planned for the next quarterly reporting period (Third Quarter 2003) include the following (not in chronological order)

- Submit the Facility Structure IRAM Work Plan;
- Conduct the NDL/West Doane Lake Groundwater Modeling;
- Conduct NAPL evaluation;
- Conduct NDL field sampling event;
- Submit the RP property Human Health Risk Assessment; and
- Conduct Lake Area Geophysical Survey.

If you have any questions, please call Roger Gresh at (503) 639-3400.

Sincerely,

**AMEC Earth & Environmental, Inc.**

Scott Kranz R.G.
Senior Hydrogeologist

Roger Gresh, P.G.
Project Manager

SK/lp



SCOEPA00009969

c: R. Ferguson, SLLI
J. Benedict, CHBH&L
M. Kent, DEQ - NW Region
D. Blount, CLB&W
K. McCaw, ESCO Corp.
E. McDaniel, SMR&H
B. Sheppard, BNSF
C. Young, Wacker Siltronic Corporation
L. Patterson, ATOFINA North America, Inc.
I. Dubrow Davidson, Schnitzer Investment Corp.
J. Baird, Air Liquide America Corp.



SCOEPA00009970

Chris
Tom
MFA

April 18, 2002

0-61M-10703-0/Task 43

RECEIVED
APR 19 2002
DEPT OF ENVIRONMENTAL QUALITY
NORTHWEST REGION

Eric Blischke
Coordinator, Portland Harbor
Department of Environmental Quality
2020 S.W. 4th Avenue
Portland, Oregon 97201

Dear Mr. Blischke:

**Re: Focused Spring 2002 Groundwater Characterization Event**
**Water Level Measurements**
**RPAC - Portland Site**
**Portland, Oregon**

On behalf of Aventis CropScience (RPAC), AMEC Earth & Environmental, Inc. (AMEC) is providing to the Oregon Department of Environmental (DEQ) the results of water level monitoring at the RPAC Site. RPAC understands that DEQ coordinated a synchronous water level monitoring event among several property owners near the RPAC property and, therefore, RPAC is submitting the RPAC water level monitoring results for DEQ's use and review. The attached water level data will also be submitted in the forthcoming Groundwater Monitoring Report for the Spring 2002 groundwater event.

AMEC collected groundwater level and surface water level information according to the scope and procedures included in the Final Focused Spring 2002 Groundwater Characterization Field Sampling Plan (FSP) dated March 8, 2002, and approved by DEQ in a letter dated March 14, 2002. Water level measurements were collected on April 2 and 3, 2002. AMEC is currently proceeding with groundwater sampling according to the FSP. Please note that the four monitoring wells to be installed at the Wacker property (series RP-07 wells) are scheduled for installation the week of April 15 and, therefore, water level measurements from these wells are not included in this submittal. Following installation of the RP-07 series monitoring wells, water level measurements and groundwater samples will be collected according to the FSP.

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www.amec.com



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The attached hard copy table is also provided in Microsoft Excel format on the enclosed compact disk (CD). A figure of monitoring well and staff gauge locations is also attached for your reference. If you have any questions, please call Roger Gresh at (503) 639-3400.

Sincerely,

**AMEC Earth & Environmental, Inc.**

for

Roger Gresh, P.G.
Project Manager

Teresa A.R. Wilson
Project Geologist

Attachments: Table 1 Groundwater Elevations and NAPL Thickness Measurements
Figure 1 Focused Spring 2002 Groundwater Characterization Water Level Measurement Locations

RTG/JF/lp

c: R. Ferguson, Aventis CropScience
J. Benedict, CHBH&L

REGISTERED PROFESSIONAL GEOLOGIST
OREGON
SCOTT KRANZ
No. G1944

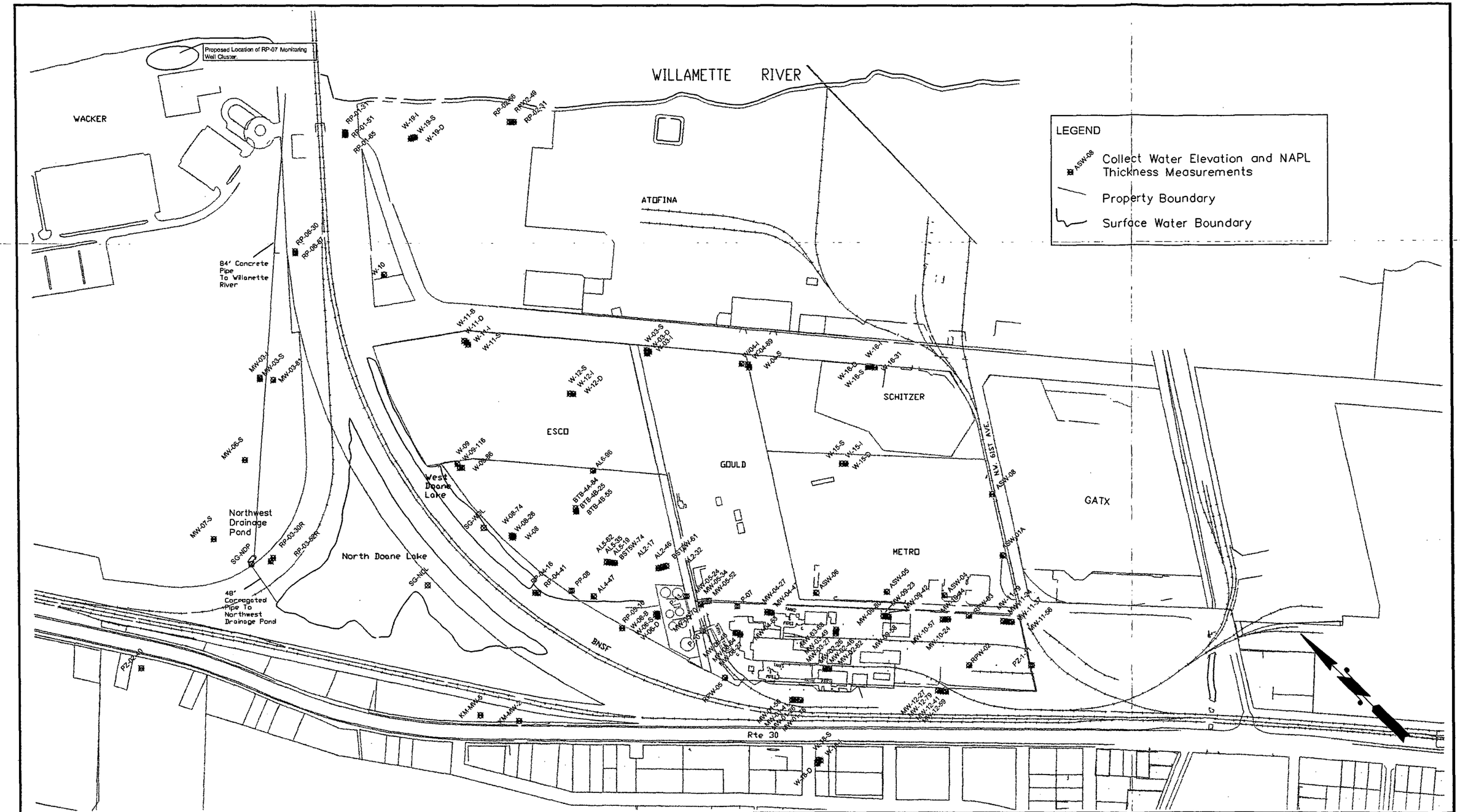


SCOEPA00009973

# ATTACHMENTS



SCOEPA00009974




amec

7376 SW Durham Road
Portland, OR, U.S.A. 97224

| | |
|---|---|
| W.O. | 0-61M-107030T43 |
| DESIGN | TARW |
| DRAWN | BRJ |
| DATE | APRIL 2002 |
| SCALE | 1"=350' |

**FIGURE 1**
**FOCUSED SPRING 2002**
**GROUNDWATER CHARACTERIZATION**
**WATER LEVEL MEASUREMENT LOCATIONS**
**RPAC, PORTLAND SITE**

AMEC DRAWING NO. K:\10000\10700\10703\Task 43 Groundwater Monitoring\2002 Spring Event\FSP\Spring 2002 Water Level Measurement Locations.dwg

# TABLE 1
## Groundwater Elevations and NAPL Thickness Measurements
## Focused Spring 2002 Groundwater Characterization Event, April 2002
## RPAC - Portland Site

| Site ID | Type | Location/Property | Location: x coordinate | Location: y coordinate | Depth to Water (Feet BMP) | Date | Time | Measuring Point Elevation (Feet AMSL) | Groundwater Elevation | LNAPL Thickness (Feet) | DNAPL Thickness (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AL2-17 | Well | RPAC - LAKE AREA | 7625853.2 | 701670.4 | 11.71 | 4/2/2002 | 16:03 | 41.77 | 30.06 | None | None |
| AL2-32 | Well | RPAC - LAKE AREA | 7625880.3 | 701656 | 13.82 | 4/2/2002 | 15:59 | 41.41 | 27.59 | None | None |
| AL2-46 | Well | RPAC - LAKE AREA | 7625861.6 | 701665.6 | 14.08 | 4/2/2002 | 16:05 | 41.77 | 27.69 | None | None |
| AL4-47 | Well | RPAC - LAKE AREA | 7625605.9 | 701768.4 | 12.60 | 4/2/2002 | 15:24 | 40.24 | 27.64 | None | None |
| AL5-19 | Well | RPAC - LAKE AREA | 7625744.9 | 701808.2 | 12.20 | 4/2/2002 | 15:07 | 40.07 | 27.87 | None | None |
| AL5-35 | Well | RPAC - LAKE AREA | 7625738.5 | 701816.9 | 12.50 | 4/2/2002 | 15:09 | 39.54 | 27.04 | None | None |
| AL5-62 | Well | RPAC - LAKE AREA | 7625732.4 | 701825.1 | 12.61 | 4/2/2002 | 15:12 | 39.59 | 26.98 | None | None |
| AL6-96 | Well | RPAC - LAKE AREA | 7625941.2 | 702105.3 | 15.29 | 4/2/2002 | 14:42 | 38.72 | 23.43 | None | None |
| ASW-01A | Well | METRO | 7626802.2 | 700791.6 | 6.16 | 4/2/2002 | 14:15 | 38.81 | 32.65 | None | None |
| ASW-04 | Well | METRO | 7626539.5 | 700840.6 | 6.83 | 4/2/2002 | 14:28 | 40.76 | 33.93 | None | None |
| ASW-05 | Well | METRO | 7626395.202 | 701003.193 | 7.57 | 4/2/2002 | 13:28 | * | NA | None | None |
| ASW-06 | Well | METRO | 7626207.1 | 701185.3 | 6.26 | 4/2/2002 | 13:43 | 40.10 | 33.84 | None | None |
| ASW-08 | Well | METRO | 7626937.7 | 700982.2 | 6.50 | 4/2/2002 | 14:07 | 36.72 | 30.22 | None | None |
| BST2W-61 | Well | RPAC - LAKE AREA | 7625870.5 | 701660.7 | 13.61 | 4/2/2002 | 16:08 | 41.13 | 27.52 | None | None |
| BST5W-74 | Well | RPAC - LAKE AREA | 7625751.1 | 701800.5 | 13.18 | 4/2/2002 | 15:19 | 39.84 | 26.66 | None | None |
| BTB-4A-84 | Well | RPAC - LAKE AREA | 7625792.8 | 702051.7 | 14.94 | 4/2/2002 | 14:55 | 39.50 | 24.56 | None | None |
| BTB-4B-25 | Well | RPAC - LAKE AREA | 7625786.5 | 702041.4 | 9.57 | 4/2/2002 | 14:51 | 39.54 | 29.97 | None | None |
| BTB-4B-55 | Well | RPAC - LAKE AREA | 7625786.5 | 702041.4 | 15.21 | 4/2/2002 | 14:52 | 39.81 | 24.60 | None | None |
| KM-MW-2 | Well | KINDER MORGAN | 7625073.18 | 701633.63 | 23.49 | 4/2/2002 | 09:10 | 50.68 | 27.19 | None | None |
| KM-MW-5 | Well | KINDER MORGAN | 7624986.16 | 701751.74 | 21.99 | 4/2/2002 | 09:14 | 50.78 | 28.79 | None | None |
| MW-01-26 | Well | RPAC - HERBICIDE AREA | 7625867.5 | 700954.5 | 10.57 | 4/2/2002 | 13:38 | 49.89 | 39.32 | None | None |
| MW-01-41 | Well | RPAC - HERBICIDE AREA | 7625861.2 | 700960.5 | 12.71 | 4/2/2002 | 13:40 | 49.53 | 36.82 | None | None |
| MW-01-56 | Well | RPAC - HERBICIDE AREA | 7625856.9 | 700964.4 | 12.96 | 4/2/2002 | 13:42 | 49.70 | 36.74 | None | None |
| MW-01-76 | Well | RPAC - HERBICIDE AREA | 7625878.6 | 700941.1 | 15.51 | 4/2/2002 | 13:36 | 47.70 | 32.19 | None | None |
| MW-02-26 | Well | RPAC - HERBICIDE AREA | 7626028 | 700958.6 | 11.67 | 4/3/2002 | 09:32 | 48.09 | 36.42 | None | None |
| MW-02-46 | Well | RPAC - HERBICIDE AREA | 7626033.4 | 700952.6 | 11.51 | 4/3/2002 | 09:30 | 47.91 | 36.40 | None | None |
| MW-02-62 | Well | RPAC - HERBICIDE AREA | 7626038.2 | 700947.4 | 11.09 | 4/3/2002 | 09:27 | 48.00 | 36.91 | None | None |
| MW-03-27 | Well | RPAC - HERBICIDE AREA | 7626150.1 | 701025.8 | 12.43 | 4/3/2002 | 09:12 | 48.29 | 35.86 | None | None |
| MW-03-49 | Well | RPAC - HERBICIDE AREA | 7626155.8 | 701030.9 | 12.39 | 4/3/2002 | 09:04 | 48.28 | 35.89 | None | None |
| MW-03-68 | Well | RPAC - HERBICIDE AREA | 7626162.2 | 701035 | 12.31 | 4/3/2002 | 09:06 | 48.25 | 35.94 | None | None |
| MW-03-81 | Well | WACKER | 7625335.5 | 703198.3 | 18.41 | 4/2/2002 | 09:41 | 35.54 | 17.13 | None | None |
| MW-03-I | Well | WACKER | 7625304.4 | 703241.6 | 18.94 | 4/2/2002 | 09:33 | 36.43 | 17.49 | None | None |
| MW-03-S | Well | WACKER | 7625301.2 | 703236.6 | 11.86 | 4/2/2002 | 09:36 | 36.35 | 24.49 | None | None |
| MW-04-27 | Well | RPAC - HERBICIDE AREA | 7626025.4 | 701264.7 | 14.81 | 4/3/2002 | 09:52 | 47.53 | 32.72 | None | None |
| MW-04-47 | Well | RPAC - HERBICIDE AREA | 7626031.2 | 701258 | 14.51 | 4/3/2002 | 09:55 | 47.65 | 33.14 | None | None |
| MW-04-63 | Well | RPAC - HERBICIDE AREA | 7626035 | 701250.7 | 14.59 | 4/3/2002 | 09:59 | 48.00 | 33.41 | None | None |
| MW-05-24 | Well | RPAC - HERBICIDE AREA | 7625886.2 | 701462.8 | 7.60 | 4/3/2002 | 10:20 | 37.83 | 30.23 | None | None |



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# TABLE 1
## Groundwater Elevations and NAPL Thickness Measurements
## Focused Spring 2002 Groundwater Characterization Event, April 2002
## RPAC - Portland Site

| Site ID | Type | Location/Property | Location: x coordinate | Location: y coordinate | Depth to Water (Feet BMP) | Date | Time | Measuring Point Elevation (Feet AMSL) | Groundwater Elevation | LNAPL Thickness (Feet) | DNAPL Thickness (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-05-34 | Well | RPAC - HERBICIDE AREA | 7625891.9 | 701457.8 | 7.78 | 4/3/2002 | 10:23 | 37.83 | 30.05 | None | None |
| MW-05-52 | Well | RPAC - HERBICIDE AREA | 7625897.6 | 701452.7 | 10.00 | 4/3/2002 | 10:26 | 37.70 | 27.70 | None | None |
| MW-05-70 | Well | RPAC - HERBICIDE AREA | 7625867.6 | 701464.5 | 10.82 | 4/3/2002 | 10:36 | 38.33 | 27.51 | None | None |
| MW-06-S | Well | WACKER | 7625042.4 | 703062.3 | 11.36 | 4/2/2002 | 10:14 | 36.37 | 25.01 | None | None |
| MW-07-S | Well | WACKER | 7624746.3 | 702935.8 | 12.44 | 4/2/2002 | 10:06 | 37.32 | 24.88 | None | None |
| MW-08-27 | Well | RPAC - HERBICIDE AREA | 7625892.8 | 701277 | 23.25 | 4/9/2002 | 15:30 | 48.23 | 24.98 | 6.63** | None |
| MW-08-46 | Well | RPAC - HERBICIDE AREA | 7625883.4 | 701295 | 16.15 | 4/3/2002 | 10:35 | 48.11 | 31.96 | None | None |
| MW-08-64 | Well | RPAC - HERBICIDE AREA | 7625889.7 | 701288.5 | 15.98 | 4/3/2002 | 10:25 | 47.97 | 31.99 | None | None |
| MW-09-23 | Well | RPAC - HERBICIDE AREA | 7626326.3 | 700942.1 | 12.55 | 4/3/2002 | 08:50 | 47.03 | 34.48 | None | None |
| MW-09-42 | Well | RPAC - HERBICIDE AREA | 7626330.3 | 700938.3 | 13.30 | 4/3/2002 | 08:53 | 47.64 | 34.34 | None | None |
| MW-09-58 | Well | RPAC - HERBICIDE AREA | 7626333.2 | 700931.7 | 12.29 | 4/3/2002 | 08:55 | 46.21 | 33.92 | None | None |
| MW-09-80 | Well | RPAC - HERBICIDE AREA | 7626322.2 | 700946.8 | 12.49 | 4/3/2002 | 08:47 | 46.67 | 34.18 | None | None |
| MW-10-24 | Well | RPAC - INSECTICIDE AREA | 7626485 | 700767.1 | 11.69 | 4/2/2002 | 15:24 | 46.21 | 34.52 | None | None |
| MW-10-44 | Well | RPAC - INSECTICIDE AREA | 7626477.8 | 700773.7 | 12.04 | 4/2/2002 | 15:26 | 46.54 | 34.50 | None | None |
| MW-10-57 | Well | RPAC - INSECTICIDE AREA | 7626470.7 | 700780.8 | 11.95 | 4/2/2002 | 15:28 | 46.66 | 34.71 | None | None |
| MW-11-24 | Well | RPAC - INSECTICIDE AREA | 7626634 | 700606.4 | 9.44 | 4/2/2002 | 14:52 | 44.01 | 34.57 | None | None |
| MW-11-37 | Well | RPAC - INSECTICIDE AREA | 7626639.6 | 700598.6 | 9.14 | 4/2/2002 | 14:54 | 43.80 | 34.66 | None | None |
| MW-11-56 | Well | RPAC - INSECTICIDE AREA | 7626646.4 | 700591.5 | 8.59 | 4/2/2002 | 14:56 | 43.63 | 35.04 | None | None |
| MW-11-79 | Well | RPAC - INSECTICIDE AREA | 7626626.5 | 700615.7 | 8.57 | 4/2/2002 | 14:59 | 44.14 | 35.57 | None | None |
| MW-12-27 | Well | RPAC - INSECTICIDE AREA | 7626272.7 | 700596 | 12.85 | 4/2/2002 | 13:20 | 50.22 | 37.37 | None | None |
| MW-12-41 | Well | RPAC - INSECTICIDE AREA | 7626279.3 | 700587.8 | 12.69 | 4/2/2002 | 13:25 | 50.08 | 37.39 | None | None |
| MW-12-59 | Well | RPAC - INSECTICIDE AREA | 7626285.7 | 700579.9 | 12.14 | 4/2/2002 | 13:26 | 49.58 | 37.44 | None | None |
| MW-12-79 | Well | RPAC - INSECTICIDE AREA | 7626266.6 | 700605.4 | 12.82 | 4/2/2002 | 13:15 | 50.08 | 37.26 | None | None |
| P-07 | Piezometer | RPAC - HERBICIDE AREA | 7625960.462 | 701359.943 | 14.59 | 4/3/2002 | 10:03 | 46.27 | 31.68 | None | None |
| P-10 | Piezometer | RPAC | 7625801.802 | 701388.893 | 9.44 | 4/3/2002 | 09:13 | 40.19 | 30.75 | None | None |
| P-11 | Piezometer | RPAC - HERBICIDE AREA | 7625852.1 | 701523.1 | 9.50 | 4/3/2002 | 09:03 | 39.29 | 29.79 | None | None |
| PP-08 | Piezometer | RPAC - LAKE AREA | 7625560.6 | 701843.3 | 10.26 | 4/2/2002 | 15:29 | 37.76 | 27.50 | None | None |
| PZ-02-40 | Piezometer | RTE 30/ COP ROW | 7624207.6 | 702784.8 | 36.29 | 4/2/2002 | 09:30 | 64.53 | 28.24 | None | None |
| PZ-1-11 | Piezometer | BNSF | 7626583.3 | 700421.9 | 6.46 | 4/2/2002 | 12:55 | 45.28 | 38.82 | None | None |
| RP-01-31 | Well | BNSF | 7626192.5 | 703665.7 | 25.21 | 4/2/2002 | 08:50 | 35.38 | 10.17 | None | None |
| RP-01-51 | Well | BNSF | 7626189.7 | 703662.3 | 25.15 | 4/2/2002 | 08:53 | 35.28 | 10.13 | None | None |
| RP-01-65 | Well | BNSF | 7626185.1 | 703657.9 | 24.95 | 4/2/2002 | 08:56 | 35.00 | 10.05 | None | None |
| RP-02-31 | Well | ATOFINA | 7626667.3 | 703244.5 | 30.41 | 4/2/2002 | 10:15 | 40.12 | 9.71 | None | None |
| RP-02-49 | Well | ATOFINA | 7626661.8 | 703250.7 | 30.15 | 4/2/2002 | 10:17 | 39.83 | 9.68 | None | None |
| RP-02-66 | Well | ATOFINA | 7626657.2 | 703255.3 | 30.41 | 4/2/2002 | 10:20 | 39.70 | 9.29 | None | None |
| RP-03-30R | Well | BNSF | 7624856.4 | 702724.3 | 14.84 | 4/2/2002 | 10:45 | 36.61 | 21.77 | None | None |
| RP-03-52R | Well | BNSF | 7624840.7 | 702723.1 | 17.10 | 4/2/2002 | 10:42 | 36.60 | 19.50 | None | None |



SCOEPA00009977

# TABLE 1
## Groundwater Elevations and NAPL Thickness Measurements
## Focused Spring 2002 Groundwater Characterization Event, April 2002
## RPAC - Portland Site

| Site ID | Type | Location/Property | Location: x coordinate | Location: y coordinate | Depth to Water (Feet BMP) | Date | Time | Measuring Point Elevation (Feet AMSL) | Groundwater Elevation | LNAPL Thickness (Feet) | DNAPL Thickness (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RP-04-16 | Piezometer | BNSF | 7625459.1 | 701934.4 | 9.88 | 4/2/2002 | 15:37 | 33.66 | 23.78 | None | None |
| RP-04-41 | Well | BNSF | 7625465.8 | 701926.5 | 7.37 | 4/2/2002 | 15:41 | 34.10 | 26.73 | None | None |
| RP-05-16 | Piezometer | BNSF | 7625594.7 | 701608.5 | 11.92 | 4/2/2002 | 16:11 | 40.54 | 28.62 | None | None |
| RP-06-30 | Well | BNSF | 7625738.7 | 703482 | 16.60 | 4/2/2002 | 11:03 | 37.10 | 20.50 | None | None |
| RP-06-87 | Well | BNSF | 7625734.6 | 703476.9 | 25.41 | 4/2/2002 | 11:00 | 37.20 | 11.79 | None | None |
| RPW-02 | Well | RPAC - INSECTICIDE AREA | 7626418.2 | 700588.6 | 9.99 | 4/2/2002 | 15:37 | 47.07 | 37.08 | None | None |
| RPW-03 | Well | RPAC - INSECTICIDE AREA | 7626550 | 700721.2 | 9.19 | 4/2/2002 | 15:13 | 43.94 | 34.75 | None | None |
| RPW-05 | Well | RPAC - HERBICIDE AREA | 7625734 | 701204.5 | 15.91 | 4/3/2002 | 09:24 | 49.83 | 33.92 | None | None |
| SG-NDL | Staff Gauge | NORTH DOANE LAKE | 7625168.5 | 702282 | 4.05 | 4/3/2002 | 13:10 | 27.46 | 23.41 | None | None |
| SG-NDP | Staff Gauge | NW DRAINAGE POND | 7624779.93 | 702767.56 | 5.66 | 4/2/2002 | 10:36 | 24.81 | 19.15 | None | None |
| SG-WDL | Staff Gauge | WEST DOANE LAKE | 7625497.9 | 702242.6 | 2.12 | 4/2/2002 | 14:30 | 26.74 | 24.62 | None | None |
| W-03-D | Well | GOULD | 7626410.6 | 702274.3 | 11.82 | 4/2/2002 | 12:08 | 32.47 | 20.65 | None | None |
| W-03-I | Well | GOULD | 7626401.2 | 702273.6 | 8.04 | 4/2/2002 | 12:04 | 32.93 | 24.89 | None | None |
| W-03-S | Well | GOULD | 7626408.2 | 702283.4 | 9.39 | 4/2/2002 | 11:57 | 34.17 | 24.78 | None | None |
| W-04-89 | Well | GOULD | 7626639.1 | 701977.4 | 10.68 | 4/2/2002 | 11:44 | 35.94 | 25.26 | None | None |
| W-04-I | Well | GOULD | 7626623.8 | 701996.9 | 9.05 | 4/2/2002 | 11:31 | 32.52 | 23.47 | None | None |
| W-04-S | Well | GOULD | 7626634.8 | 701966.8 | 6.85 | 4/2/2002 | 11:34 | 32.57 | 25.72 | None | None |
| W-06-B | Well | RPAC - LAKE AREA | 7625721.9 | 701553.5 | 12.40 | 4/2/2002 | 15:59 | 39.96 | 27.56 | None | None |
| W-06-D | Well | RPAC - LAKE AREA | 7625721.5 | 701544.1 | 9.65 | 4/2/2002 | 16:02 | 41.10 | 31.45 | None | None |
| W-06-S | Well | RPAC - LAKE AREA | 7625728.3 | 701552.6 | 10.10 | 4/2/2002 | 15:57 | 39.55 | 29.45 | None | None |
| W-08 | Well | RPAC - LAKE AREA | 7625548.3 | 702140.4 | 8.32 | 4/2/2002 | 14:25 | 35.87 | 27.55 | None | None |
| W-08-26 | Well | RPAC - LAKE AREA | 7625553.9 | 702141.2 | 9.71 | 4/2/2002 | 14:20 | 38.66 | 28.95 | None | None |
| W-08-74 | Well | RPAC - LAKE AREA | 7625551.3 | 702147.6 | 12.54 | 4/2/2002 | 14:22 | 38.77 | 26.23 | None | None |
| W-09 | Well | RPAC - LAKE AREA | 7625599.7 | 702482.4 | 7.30 | 4/2/2002 | 14:11 | 34.88 | 27.58 | None | None |
| W-09-116 | Well | RPAC - LAKE AREA | 7625596.4 | 702465.4 | 17.26 | 4/2/2002 | 14:08 | 38.12 | 20.86 | None | None |
| W-09-86 | Well | RPAC - LAKE AREA | 7625601 | 702460.4 | 17.60 | 4/2/2002 | 14:04 | 38.54 | 20.94 | None | None |
| W-10 | Well | PUMP STATION | 7625912.5 | 703183.7 | 18.62 | 4/2/2002 | 09:11 | 31.99 | 13.37 | None | None |
| W-11-B | Well | ESCO | 7625949 | 702792.3 | 26.46 | 4/2/2002 | 10:39 | 41.33 | 14.87 | None | None |
| W-11-D | Well | ESCO | 7625950.3 | 702782.3 | 25.95 | 4/2/2002 | 10:43 | 40.09 | 14.14 | None | None |
| W-11-I | Well | ESCO | 7625950.3 | 702782.3 | 25.78 | 4/2/2002 | 10:41 | 40.28 | 14.50 | None | None |
| W-11-S | Well | ESCO | 7625948.8 | 702772.3 | 9.70 | 4/2/2002 | 10:45 | 40.90 | 31.20 | None | None |
| W-12-D | Well | ESCO | 7626093.7 | 702364.1 | 20.76 | 4/2/2002 | 10:58 | 41.63 | 20.87 | None | None |
| W-12-I | Well | ESCO | 7626093.7 | 702364.1 | 20.62 | 4/2/2002 | 11:02 | 41.66 | 21.04 | None | None |
| W-12-S | Well | ESCO | 7626086.5 | 702373.1 | 11.79 | 4/2/2002 | 10:55 | 41.41 | 29.62 | None | None |
| W-15-D | Well | METRO | 7626631 | 701454.2 | 11.34 | 4/2/2002 | 13:59 | 40.53 | 29.19 | None | None |
| W-15-I | Well | METRO | 7626631 | 701454.2 | 10.68 | 4/2/2002 | 13:57 | 40.72 | 30.04 | None | None |
| W-15-S | Well | METRO | 7626622.9 | 701462.4 | 10.82 | 4/2/2002 | 13:55 | 40.82 | 30.00 | None | None |



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# TABLE 1
## Groundwater Elevations and NAPL Thickness Measurements
## Focused Spring 2002 Groundwater Characterization Event, April 2002
## RPAC - Portland Site

| Site ID | Type | Location/Property | Location: x coordinate | Location: y coordinate | Depth to Water (Feet BMP) | Date | Time | Measuring Point Elevation (Feet AMSL) | Groundwater Elevation | LNAPL Thickness (Feet) | DNAPL Thickness (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| W-16-31 | Well | SCHNITZER | 7626965 | 701634 | 6.80 | 4/2/2002 | 11:47 | 33.70 | 26.90 | None | None |
| W-16-D | Well | SCHNITZER | 7626954.6 | 701648.8 | 10.18 | 4/2/2002 | 11:52 | 35.44 | 25.26 | None | None |
| W-16-I | Well | SCHNITZER | 7626954.6 | 701648.8 | 10.10 | 4/2/2002 | 11:50 | 35.42 | 25.32 | None | None |
| W-16-S | Well | SCHNITZER | 7626949.9 | 701653.3 | 7.11 | 4/2/2002 | 11:54 | 35.07 | 27.96 | None | None |
| W-18-D | Well | UPGRADIENT | 7625753.3 | 700727.9 | 18.41 | 4/2/2002 | 08:55 | 55.70 | 37.29 | None | None |
| W-18-I | Well | UPGRADIENT | 7625770.1 | 700727.6 | 16.89 | 4/2/2002 | 08:50 | 54.73 | 37.84 | None | None |
| W-18-S | Well | UPGRADIENT | 7625765.8 | 700734.3 | 16.32 | 4/2/2002 | 08:52 | 55.23 | 38.91 | None | None |
| W-19-D | Well | ATOFINA | 7626363.1 | 703467.2 | 24.42 | 4/2/2002 | 09:59 | 35.12 | 10.70 | None | None |
| W-19-I | Well | ATOFINA | 7626348.5 | 703475 | 24.85 | 4/2/2002 | 09:55 | 35.34 | 10.49 | None | None |
| W-19-S | Well | ATOFINA | 7626357.7 | 703470.9 | 24.63 | 4/2/2002 | 09:58 | 35.20 | 10.57 | None | None |

Notes:

| | |
|---|---|
| BMP | Below Measuring Point |
| NA | Not Applicable |
| AMSL | Above Mean Sea Level, in City of Portland (COP) datum |
| LNAPL | Light Non-Aqueous-Phase Liquid |
| DNAPL | Dense Non-Aqueous-Phase Liquid |
| * | Survey data not available |
| ** | An estimated NAPL thickness of 8.5 feet and a depth to water of 23.14 feet BMP were recorded on April 3, 2002, using an electronic water level probe; this monitoring well was re-measured using an interface probe on April 9, 2002, with results as indicated in this table. |

Note: Groundwater Elevations have not been adjusted for potential displacement by LNAPL/DNAPL. NAPL was measured within bailers retrieved from monitoring wells, on well sounding equipment, and/or through the use of an interface probe. This is considered to approximate the thickness of NAPL in the monitoring well. The NAPL thickness measured within bailers retrieved from monitoring wells does not represent the actual thickness of NAPL in the formation.



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January 10, 2003

0-61M-10703-0/Task 15

Eric Blischke
Coordinator, Portland Harbor
Department of Environmental Quality - Northwest Region
2020 SW 4th Avenue, Suite 400
Portland, Oregon 97201-4987

Dear Mr. Blischke

**Re: Quarterly Progress Report for RI/FS**
**RPAC - Portland Site**
**Fourth Quarter, 2002**

On behalf of RPAC, AMEC Earth & Environmental, Inc. (AMEC) is submitting three stapled copies of the enclosed Fourth Quarter, 2002 Progress Report as required by the July 1999 Consent Order. One additional copy will be sent directly to Mavis Kent of DEQ, per DEQ's request.

## Introduction

On behalf of RPAC, AMEC Earth & Environmental, Inc. (AMEC) has prepared this Quarterly Progress Report for Remedial Investigation/Feasibility Study (RI/FS) activities associated with the RPAC Portland Site. This report covers activities conducted during the fourth calendar quarter of year 2002 (October 1, 2002 through December 30, 2002), and is prepared as specified by the Consent Order (No. WMCSR-NWR-99-07) executed between RPAC and the Oregon Department of Environmental Quality (DEQ) in July 1999 (the Order).

## Current Reporting Activities

### North Doane Lake Ecological Risk Assessment

The Draft North Doane Lake (NDL) Level II Aquatic Ecological Risk Assessment (ERA) (Draft NDL Level II ERA) was submitted to DEQ on October 15, 2002.

The DEQ provided comments to the Draft NDL Level II ERA in a letter dated November 19, 2002. RPAC provided responses to DEQ comments in a letter dated December 20, 2002.

### Groundwater Characterization Report

The Draft Groundwater Characterization Report (GCR) for the RPAC Portland Site was submitted to the DEQ on December 2, 2002.

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7376 SW Durham Road
Portland, Oregon
USA 97224
Tel +1 (503) 639-3400
Fax +1 (503) 620-7892

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amec

**Granulated Activated Carbon Replacement**

RPAC contracted Calgon Carbon Corporation, Inc. to remove approximately 40,000 pounds (dry-weight) of spent GAC material from adsorber vessels at the RPAC groundwater treatment system (treatment system). The work was completed October 22, 2002 through October 25, 2002. The spent GAC was transferred from the adsorber units into dewatering bins using a slurry process. Free water generated during the transfer was collected and pumped to the treatment system. The spent GAC now is fully dewatered, and the bins containing the spent GAC have been covered and stored on a secondary containment pad located near the treatment system, pending decisions concerning final disposal.

**Groundwater Transport Evaluation Field Work**

The Groundwater Transportation Evaluation Field Technical Memorandum (GTE Field TM) was submitted to the DEQ on November 12, 2002.

**Source Area Soils Characterization**

RPAC met with DEQ on October 21, 2002 to discuss the content of the Draft Source Area Soils Characterization Report submitted to DEQ on June 17, 2002. The DEQ provided comments to the report on September 3, 2002. RPAC provided a letter summarizing the salient conclusions from the October 31, 2002 meeting on December 9, 2002.

**Investigative-Derived Waste (IDW) Disposal**

IDW generated during the Stage 2 Source Area sampling event, extraction well sample collection, and soil and debris from historic sampling activities was transported to an approved hazardous waste disposal facility on November 6, 2002. Spencer Environmental transported seventeen 55-gallon drums of IDW to the Chemical Waste Management Landfill, Arlington, Oregon facility for disposal.

IDW generated during the Stage 2 Source Area sampling event and the Remaining Remedial Investigation fieldwork was transported to an approved hazardous waste disposal facility on December 16, 2002. Spencer Environmental transported nine 55-gallon drums of IDW to the Chemical Waste Management Landfill, Arlington, Oregon facility for disposal.

**Significant Problems Encountered**

No significant problems were encountered during this current reporting period.

**Activities Planned for the Next Reporting Period**

The activities currently planned for the next quarterly reporting period (First Quarter 2003) include the following (not in chronological order)

- Submittal of the revised NDL Level II Ecological Risk Assessment Report;
- Submittal of a request for off-site disposal of GAC as CAMU-eligible waste;
- Submittal of the revised Source Area Soils Characterization Report;



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- Submittal of the Remaining Remedial Investigation Technical Memorandum;
- Submittal of the Bioremediation Evaluation Work Plan;
- Submittal of the Lake Area Geophysical Survey Work Plan;
- Submittal of the Facility Structure IRAM Work Plan;
- Submittal of the Non-Aqueous Phase Liquid Evaluation Work Plan;
- Initiate preparation of the North Doane Lake/West Doane Lake Area Groundwater Transport Evaluation; and
- Initiate preparation of the Human Health Risk Assessment.

If you have any questions, please call Roger Gresh at (503) 639-3400.

Sincerely,

**AMEC Earth & Environmental, Inc.**

Scott Kranz R.G.
Senior Hydrogeologist

for Roger Gresh, P.G.
Project Manager

SK/lp

cc: R. Ferguson, RPAC
J. Benedict, CHBH&L
M. Kent, DEQ - NW Region
D. Blount, CLB&W
K. McCaw, ESCO Corp.
E. McDaniel, SMR&H
B. Sheppard, BNSF
C. Young, Wacker Siltronic Corporation
L. Patterson, ATOFINA North America, Inc.
I. Dubrow Davidson, Schnitzer Investment Corp.
J. Baird, Air Liquide America Corp.



SCOEPA00009982

HARDY MYERS
Attorney General

DAVID SCHUMAN
Deputy Attorney General

**DEPARTMENT OF JUSTICE**
GENERAL COUNSEL DIVISION

June 26, 2000

Richard Bach
Stoel Rives LLP
900 SW 5th Ave., Ste. 2600
Portland, OR 97204

By 1st-Class Mail

Christopher Reive
Tarlow Jordan & Schrader
P.O. Box 230669
Portland, OR 97281

Re: Wacker Siltronic Property

Dear Dick and Chris:

I recently broached with both of you the idea that Wacker Siltronic Corp. (Wacker) and Northwest Natural Gas Co. (NW Natural) jointly undertake remedial investigation and potential source control measures at the Wacker property in northwest Portland on the Willamette River. As I discussed, my view is that Wacker and NW Natural each appear to be liable for contamination at the Wacker property that might be associated with sediments contamination in the river. Wacker has declined DEQ's requests that Wacker perform a remedial investigation, at least as to all potential releases of concern regardless of date. NW Natural has declined to characterize the offsite extent of contamination on the Wacker property pursuant to NW Natural's existing voluntary agreement with DEQ. DEQ has authorized me to explore the idea of a joint administrative consent order with Wacker and NW Natural instead of the agency proceeding with issuance of a unilateral order at this time.

To that end, enclosed is a proposed joint consent order and scope of work. You will see that their scope is limited to upland investigation of sources and pathways for sediments contamination at or near the Wacker property, evaluation of source control measures, and implementation of source control if necessary. The scope of work allows the parties to perform a pre-RI assessment and provides for an RI offramp. The consent order further includes a provision addressing the contingency of NPL listing to help the parties avoid duplicative obligations between DEQ and EPA.

In addition to offering these favorable terms under the consent order, it is DEQ's hope that the proposed joint approach will facilitate technical coordination of the investigation of tar pond contamination on the Wacker property with the pending RI/FS of contamination on the NW Natural property. A similar joint approach to overlapping contamination between adjacent



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property owners is proving effective at other current DEQ sites in the metropolitan area. As at those sites, DEQ is not proposing in the enclosed consent order to allocate specific work between the two parties, but would entertain an allocation of work agreed to and offered by Wacker and NW Natural.

I will appreciate your consideration of this proposal. Instead of you providing a written response, I suggest that we meet to discuss the proposal in concept first, and I will be calling you to arrange such a meeting. If, however, either of you know that your client is simply not interested in exploring a joint approach, please let me know as soon as possible so that I can advise DEQ.

If you would like electronic copies of the enclosed consent order and scope of work, you may contact Linda Nakagawa at 229-5725.

Sincerely,

Kurt Burkholder
Assistant Attorney General
Natural Resources Section

KBB:lan/GEN53707
Enclosures

cc w/ encl.: Eric Blischke
Lynne Perry
Mike Rosen

STATE OF OREGON

DEPARTMENT OF ENVIRONMENTAL QUALITY

| | | |
|---|---|---|
| In the Matter of: | ) | DEQ NO. _____ |
| | ) | |
| | ) | |
| WACKER SILTRONIC CORPORATION and NORTHWEST NATURAL GAS COMPANY, Respondents. | ) | ORDER ON CONSENT |
| | ) | |
| | ) | |
| | ) | |

Pursuant to ORS 465.260(4), the Director, Oregon Department of Environmental Quality (DEQ), issues this Order on Consent (Consent Order) to Wacker Siltronic Corporation (Wacker) and Northwest Natural Gas Company (NWN), referred to together in this Consent Order as "Respondents". This Consent Order contains the following provisions:

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Attachment A Site Map
Attachment B Scope of Work
Attachment C Sample Invoice

1. Purpose

The mutual objective of DEQ and Respondents is to determine the nature and extent of releases of hazardous substances to Willamette River sediments from certain property in Multnomah County, and to develop and implement source control measures to address such releases, if necessary.

2. Stipulations

Respondents consent and agree:

A. To issuance of this Consent Order;

B. To perform and comply with all provisions of this Consent Order;

C. To not challenge DEQ's jurisdiction to issue and enforce this Consent Order;

D. To waive any right Respondents might have, prior to commencement of action by DEQ to enforce this Consent Order, to seek judicial review or review by the Environmental Quality Commission of this Consent Order;



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E. To not litigate, in any proceeding brought by DEQ to enforce this Consent Order or to assess penalties for noncompliance with this Consent Order, any issue other than Respondents' compliance with this Consent Order;

F. To not assert, in any proceeding brought by DEQ to enforce this Consent Order or to assess penalties for noncompliance with this Consent Order, that performance of any interim or removal measures or phase of work by Respondents discharges Respondents' duty to fully perform all remaining provisions of this Consent Order; and

G. To waive any right Respondents might have under ORS 465.260(7) to seek reimbursement from the Hazardous Substances Remedial Action Fund of costs incurred under this Consent Order.

3. Findings of Fact

DEQ makes the following findings without admission of any such facts by Respondents:

A. Respondent Wacker Siltronic Corporation is a Delaware corporation registered to do business in Oregon. Respondent Northwest Natural Gas Company is an Oregon corporation.

B. Wacker owns real property located at 7200 NW Front Avenue in Portland (Wacker Property), occupying approximately 85 acres along the Willamette River. The Wacker Property was once owned by the Portland Gas and Coke Company (GASCO), which operated an oil gasification plant at the Wacker Property and adjacent properties from 1913 to 1956. Wacker acquired the property in 1978.



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From March 1980 to present, Wacker has operated a silicon wafer fabricating plant at the property. The general location of the Wacker Property is shown on Attachment A to this Consent Order.

C. NWN owns real property adjacent to the Wacker Property, at 7900 NW St. Helens Road in Portland (NWN Property). The NWN Property was owned as one parcel with the Wacker Property and operated as an oil gasification plant by GASCO. In 1958, GASCO became Northwest Natural Gas Company. NWN sold the portion of the GASCO property now owned by Wacker in 1962. The general location of the NWN Property is shown on Attachment A to this Consent Order.

D. The former GASCO plant produced oil gas and lampblack briquets. Waste generated at the plant included tar, spent oxide, and wastewater containing dissolved and suspended hydrocarbons. Before 1941, wastewater was discharged directly to the Willamette River. In 1941, a series of settling or tar ponds were constructed to receive wastewater. These ponds were located on what is now the NWN Property and extending on to the northern portion of the Wacker Property. The tar ponds were periodically excavated and the dredged tar disposed in low-lying areas of the site including what is now the Wacker Property. The exact nature and location of these disposal areas are unknown. Over time, the tar ponds were filled with spent oxide material, soil, and rubble and the consolidated



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materials spread over the southeastern portion of the NWN Property and the northern portion of the Wacker Property.

E. On August 8, 1994, NWN entered into an agreement with DEQ to perform a remedial investigation and feasibility study at the NWN Property, DEQ No. WMCVC-NWR-94-13.

F. Subsurface petroleum or tar has been encountered before and during various construction activities on the Wacker Property after Wacker's acquisition of the property.

G. In July and August 1985, groundwater samples collected at the Wacker Property were found to contain benzene, polycyclic aromatic hydrocarbons (PAHs), cyanide, and lead at concentrations above federal drinking water maximum contaminant levels. In July 1990, two soil samples collected from geotechnical borings at the Wacker Property were found to be saturated with a black, oily viscous substance. Total PAH concentrations detected in the two samples were 10,000 milligrams per killigram (mg/kg) and 6,100 mg/kg, respectively. In October 1990, groundwater samples collected along the utility corridor at the Wacker Property were found to contain benzene and total petroleum hydrocarbons in concentrations up to 23.3 milligrams per liter (mg/l) and 89.1 mg/l, respectively. In October 1997, Willamette River sediment samples collected adjacent to the Wacker Property were found to contain concentrations of PAHs up to 100 times baseline concentrations established for the Portland Harbor area. In July 1998, an oil sheen was observed on the



CH2M Hill Soil & Gas Analysis Report 12/90

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Willamette River. The oil sheen originated from contaminated sediments encountered during riverbank repair activities at the Wacker Property. Total petroleum hydrocarbon analysis of the contaminated material detected up to 69 mg/kg gasoline, 5810 mg/kg diesel, and 2970 mg/kg heavy oil.

H. The Wacker Property is located within a six-mile reach of the Willamette River between Sauvie Island and Swan Island known as the Portland Harbor. A 1997 study by the U.S. Environmental Protection Agency (EPA) identified elevated levels of hazardous substances in shallow, near-shore sediments throughout the Portland Harbor. EPA intends to propose the Portland Harbor for inclusion on the National Priorities List (NPL). The Portland Harbor sediments will be the subject of a remedial investigation and feasibility study conducted outside this Consent Order under EPA and/or DEQ oversight. Hazardous substances releases at the NWN property and to Willamette River sediments from the NWN Property are the subject of DEQ Agreement No. WMCVC-NWR-94-13. This Consent Order addresses sources, pathways, and source control measures for hazardous substance releases to sediments adjacent to the Wacker Property.

4. Conclusions of Law and Determinations

Based on the above findings of fact and the administrative record, DEQ determines, without admission of any such determinations by Respondents, that:

A. Respondents Wacker Siltronic Corporation and Northwest Natural Gas Company are "persons" within the meaning of ORS 465.200(20).



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B. The chemicals described in Subsection 3.G. are "hazardous substances" within the meaning of ORS 465.200(15).

C. The presence of hazardous substances in soils, groundwater, and sediments at or near the Wacker Property is the result of a "release" into the environment within the meaning of ORS 465.200(21).

D. The Wacker Property and adjacent contaminated sediments are a "facility" within the meaning of ORS 465.200(12).

E. The activities required by this Consent Order are necessary to protect public health, safety, and welfare and the environment.

Based upon the above Stipulations, Findings of Fact, and Conclusions of Law and Determinations, DEQ ORDERS:

5. Work to be Performed

A. Remedial Investigation

Respondents shall perform a Remedial Investigation (RI) in accordance with OAR Chapter 340 Division 122, the terms and schedules set forth in the Scope of Work (SOW) contained in Attachment B to this Consent Order, and the terms and schedules set forth in any DEQ-approved workplan. Once approved by DEQ, a workplan shall be deemed to be incorporated into and made a fully enforceable part of this Consent Order.



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B. Source Control Measures

In accordance with the SOW, Respondents shall identify, characterize, and evaluate any unpermitted discharge or migration of contaminants to the Willamette River or sediments identified in the RI, and, as necessary, develop and implement source control measures to address such releases.

C. Additional Measures

(1) Respondents may elect at any time during the term of this Consent Order to undertake measures, beyond those required under this Consent Order and the SOW, necessary to address the release or threatened release of hazardous substances at the Wacker Property. Such additional measures (including but not limited to engineering or institutional controls and other removal or remedial measures) shall be subject to prior approval by DEQ, which approval shall be granted if DEQ determines that the additional measures will not compromise the validity of the RI or threaten human health or the environment and will comply with applicable laws.

(2) DEQ may determine that, in addition to work specified in the SOW or an approved workplan, additional work is necessary to complete the RI in satisfaction of the SOW and OAR Chapter 340 Division 122, or is necessary to address unanticipated threats to human health or the environment. DEQ may require that such additional work be incorporated into the applicable workplan by modification and/or performed in accordance with a DEQ-specified schedule. Respondents shall modify the workplan and/or implement the additional work in accordance



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with DEQ's directions and schedule, or invoke dispute resolution under Subsection 7.L. within 14 days of receipt of DEQ's directions.

D. Dredging activities

Respondents shall notify the DEQ Project Manager at least 60 days before undertaking any dredging or other activity that might disturb sediments at or near the Wacker Property. In the notice of dredging or other activity, Respondents shall: (1) evaluate the concentration of hazardous substances present in and below the affected sediments, based on sampling and analyses performed in advance of the notice; (2) document the steps to be taken to ensure that both the activity and the subsequent management and disposal of dredged spoils will be conducted in a manner protective of human health and the environment; and (3) evaluate the effect of the activity on the Portland Harbor remedial investigation and feasibility study. Dredging may proceed under existing permits subject to the above notice and the implementation of any additional dredging or management practices required by DEQ. Respondents shall also notify DEQ of and copy DEQ on any permit application to the Oregon Division of State Lands or United States Army Corps of Engineers for dredging or other activity disturbing sediments adjacent to the Wacker Property. Notwithstanding the foregoing, Respondents may conduct dredging or other activities that might disturb sediments at or near the Wacker Property without giving DEQ 60 days notice, if such activities are conducted in accordance with an effective dredging agreement between Respondents and DEQ describing the

notification and sampling requirements, dredging, management, and disposal practices, and any other measures Respondents will take to ensure that all activities within the scope of the dredging agreement are conducted in a manner that is protective of human health and the environment and consistent with harborwide remedial work.

6. Public Participation

Upon issuance of this Consent Order, DEQ will provide public notice of this Consent Order, through issuance of a press release describing the measures required under this Consent Order. Copies of the Consent Order will be made available to the public. DEQ shall provide Respondents a draft of such press release and consider any comments by Respondents on the draft press release, before publication.

7. General Provisions

A. Qualifications of Personnel

(1) All work required by this Consent Order shall be performed under the supervision of a qualified environmental professional experienced in hazardous substance investigation or remediation. Within 10 days of the effective date of this Consent Order, Respondents shall select and provide DEQ, in writing, the name, title, and qualifications of supervising personnel and of contractors and subcontractors to be used in performance of the work. The qualifications of such personnel shall be subject to DEQ review and, at DEQ's election, DEQ approval or



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disapproval. If DEQ disapproves in writing the qualifications of any personnel, Respondents shall provide DEQ in writing the name, title, and qualifications of replacement personnel, subject to DEQ's review and approval as described above. If DEQ subsequently disapproves the replacement personnel, DEQ reserves its right under ORS 465.260 to perform the RI work, to terminate this Consent Order, and to seek reimbursement of costs from Respondents.

(2) If Respondents change supervisory or key contractor personnel during the course of work under this Consent Order, the qualifications of the personnel shall be subject to review and approval in accordance with Paragraph (1) above.

B. DEQ Access and Oversight

(1) Respondents shall allow DEQ to enter and move freely about portions of the facility within their respective possession or control at all reasonable times for the purposes, among other things, of inspecting records relating to work under this Consent Order; observing Respondents' progress in implementing this Consent Order; conducting such tests and taking such samples as DEQ deems necessary; verifying data submitted to DEQ by Respondents; and, using camera, sound recording, or other recording equipment.

(2) Respondents shall also seek to obtain access to property not owned or controlled by Respondents as necessary to perform the work required in this Consent Order, including access by DEQ for purposes described in Paragraph 7.B.(1). DEQ shall use its statutory authority to obtain access to property on behalf



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of Respondents if DEQ determines that access is necessary and that Respondents have exhausted all good faith efforts to obtain access.

(3) Respondents shall permit DEQ to inspect and copy all records, files, photographs, documents, and data relating to work under this Consent Order, except that Respondents shall not be required to permit DEQ inspection or copying of items subject to attorney-client or attorney work product privilege.

(4) Attorney-client and work product privileges may not be asserted with respect to any records required to be produced under Paragraph 7.F.(1). Respondent shall identify to DEQ any document, record, or item withheld from DEQ on the basis of attorney-client or attorney work product privilege. DEQ reserves its rights under law to obtain documents DEQ asserts are improperly withheld by Respondents.

C. Project Managers

(1) To the extent possible, all reports, notices, and other communications required under or relating to this Consent Order shall be directed to:

DEQ
Project Manager:
Eric Blischke
DEQ Northwest Region
2020 SW 4th Ave., Suite 400
Portland, OR 97201-4897
Phone: (503) 229-5648
Fax: (503) 229-6899
Blischke.Eric@deq.state.or.us

Respondents'
Project Manager:



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(2) The Project Managers shall be available and have the authority to make day-to-day decisions necessary to implement the workplan. The Project Managers also shall have the authority to modify, by mutual agreement in writing, the SOW and workplans as necessary to complete the RI in satisfaction of OAR Chapter 340 Division 122 or as necessary to address unanticipated threats to human health or the environment.

(3) A party shall notify each other party in writing if it changes its Project Manager.

D. Notice and Samples

(1) Respondents shall make every reasonable attempt to notify DEQ of any excavation, drilling, sampling, or other field work to be conducted under this Consent Order at least five working days before such activity but in no event less than 24 hours before such activity. Upon DEQ's verbal request, Respondents shall make every reasonable effort to provide a split or duplicate sample to DEQ or allow DEQ and/or its authorized representative to take a split or duplicate of any sample taken by Respondents while performing work under this Consent Order.

(2) In the event DEQ conducts any sampling or analysis in connection with this Consent Order, DEQ shall make every reasonable effort to notify Respondents of any excavation, drilling, or sampling at least five working days before such activity, but in no event less than 24 hours before such activity. Upon Respondents' verbal request, DEQ shall make every reasonable effort to provide a split or duplicate

sample to Respondents or allow Respondents to take a split or duplicate of any sample taken by DEQ.

E. Quality Assurance

(1) Respondents shall conduct all sampling, sample transport, and sample analysis in accordance with the Quality Assurance/ Quality Control (QA/QC) provisions approved by DEQ as part of the work plan. All plans prepared and work conducted as part of this Consent Order shall be approved by DEQ. Respondents shall ensure that each laboratory used by Respondents for analysis performs such analyses in accordance with such provisions. Respondents shall also ensure that DEQ and its authorized representatives are allowed access at reasonable times to laboratories and personnel used by Respondents for sample analysis.

(2) In the event that DEQ conducts sampling or analysis in connection with this Consent Order, DEQ shall conduct sampling, sample transport, and sample analysis in accordance with the QA/QC provisions of the DEQ-approved work plan. Upon written request, DEQ shall provide Respondents with DEQ records regarding such sampling, transport, and analysis.

F. Records

(1) In addition to those reports and documents specifically required under this Consent Order, Respondents shall provide to DEQ within 10 days of DEQ's written request copies of QA/QC memoranda and audits, raw data, draft and final plans, reports, task memoranda, field notes, and laboratory analytical reports.

(2) Respondents shall preserve all records and documents in possession or control or in the possession of their respective employees, agents, or contractors relating in any way to activities under this Consent Order, for at least 10 years after termination under Section 8 of this Consent Order. In complying with this provision, Respondents need not keep the original materials but may use microform, electronic, or other methods of readily retrievable information storage. Upon DEQ's request, subject to claim of privilege or confidentiality under Paragraphs 7.B.(3) or 7.F.(3), Respondents shall provide copies of such records to DEQ.

(3) Respondents may assert a claim of confidentiality as to third parties regarding any documents or records submitted to or copied by DEQ pursuant to this Consent Order. DEQ shall treat documents and records for which a claim of confidentiality has been made in accordance with ORS 192.410 through 192.505. If a Respondent does not make a claim of confidentiality at the time the documents or records are submitted to or copied by DEQ, the documents or records may be made available to the public without notice to Respondents.

(4) Subject to Paragraph 7.B.(4), nothing in this Consent Order shall be construed as a waiver of the attorney work product, attorney-client, or other applicable state and federal evidentiary privilege.

G. Progress Reports

During each month of this Consent Order, Respondents shall deliver to DEQ on or before the tenth day of each month two copies of a progress report containing:



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(1) Actions taken under this Consent Order during the previous month;

(2) Actions scheduled to be taken in the next two months;

(3) Sampling, test results, and any other data generated or received during the previous month; and

(4) A description of any problems experienced during the previous month and actions taken to resolve them.

H. Other Applicable Laws

Subject to ORS 465.315(3), all activities under this Consent Order shall be performed in accordance with applicable federal, state, and local laws and regulations.

I. Reimbursement of DEQ Oversight Costs

(1) Before entry of this Consent Order, DEQ will submit to Respondents an invoice for costs actually and reasonably incurred by DEQ up to the effective date of this Consent Order for site assessment and preparation and negotiation of this Consent Order. DEQ also will submit to Respondents a monthly invoice of costs actually and reasonably incurred by DEQ on or after the effective date of this Consent Order in connection with any activities related to the facility or oversight of Respondents' implementation of this Consent Order. A sample invoice is attached to this Consent Order as Attachment C. DEQ shall maintain work logs, payroll records, receipts, and other records to document work performed and expenses incurred under this Consent Order and, upon request, shall make such records

available to Respondents for its inspection during the term of this Consent Order and for at least one year thereafter.

(2) DEQ oversight costs payable by Respondents shall include direct costs, indirect costs, and the surcharge required by ORS 465.333. Direct costs shall include site-specific expenses, DEQ contractor costs, and DEQ legal fees and costs. Indirect costs shall include general management and support costs of DEQ and of the Northwest Region Cleanup Division allocable to DEQ oversight of this Consent Order and not charged as direct, site-specific costs. Indirect costs shall be based on a percentage of direct personal services costs.

(3) Within 30 days after the effective date of this Consent Order, as to DEQ costs incurred before the effective date of the Consent Order, or within 30 days after issuance of a DEQ monthly invoice, as to costs incurred on or after the effective date, Respondents shall pay the amount of costs billed by check made payable to the "State of Oregon, Hazardous Substance Remedial Action Fund", or invoke dispute resolution under Subsection 7.L. of this Consent Order. Respondents shall pay simple interest of 9% per annum on the unpaid balance of any oversight costs, which interest shall begin to accrue at the end of the 30-day payment period unless dispute resolution has been invoked.

J. Force Majeure

(1) If any event occurs that is beyond Respondents' reasonable control and that causes or might cause a delay or deviation in performance of the requirements of

this Consent Order despite Respondents' due diligence (force majeure), Respondents shall promptly notify DEQ's Project Manager verbally of the cause of the delay or deviation and its anticipated duration, the measures that have been or will be taken to prevent or minimize the delay or deviation, and the timetable by which Respondents propose to carry out such measures. Respondents shall confirm in writing this information within five working days of the verbal notification. Failure to comply with these notice requirements shall preclude Respondents from asserting force majeure for the event and for any additional delay caused by the event.

(2) If Respondents demonstrate to DEQ's satisfaction that the delay or deviation is due to force majeure, DEQ shall extend times for performance of related activities under this Consent Order as appropriate. Circumstances or events constituting force majeure might include but not be limited to acts of God, unforeseen strikes or work stoppages, fire, explosion, riot, sabotage, or war. Economic hardship, changed business circumstances, normal inclement weather, and increased costs of performance shall not be considered force majeure.

K. DEQ Approvals

(1) Where DEQ review and approval is required for any plan or activity under this Consent Order, Respondents shall not proceed to implement the plan or activity until DEQ approval is received. Any DEQ delay in granting or denying approval shall correspondingly extend the time for completion by Respondents. For all



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purposes under this Consent Order, "day" means calendar day unless otherwise specified.

(2) After review of any plan, report, or other item required to be submitted for DEQ approval under this Consent Order, DEQ shall:

(a) Approve the deliverable in whole or in part; or

(b) Disapprove the deliverable in whole or in part and notify Respondents of deficiencies and/or request modifications to cure the deficiencies.

DEQ approvals, rejections, modifications, or identification of deficiencies shall be given as soon as practicable in writing and state DEQ's reasons with reasonable specificity.

(3) In the event of DEQ disapproval or request for modification, Respondents shall correct the deficiencies and resubmit the revised report or other item for approval within 30 days of receipt of the DEQ notice or within such other time as specified in the DEQ notice.

(4) In the event a deficiency identified by DEQ is not addressed by Respondents in good faith in the revised deliverable, DEQ may modify the deliverable to cure the deficiency.

(5) In the event of approval or modification of the deliverable by DEQ, Respondents shall implement the action required by the plan, report, or other item, as so approved or modified, or, as to any DEQ modifications, invoke dispute resolution under Subsection 7.L.

L. Dispute Resolution

(1) In the event either Respondent disagrees with DEQ regarding additional work directed by DEQ under Paragraph 5.C.(2), DEQ costs billed under Subsection 7.I, or DEQ modifications of a deliverable under Paragraph 7.K.(4), that Respondent shall notify DEQ and the other Respondent in writing of its objection, within 30 days after issuance of the disputed monthly invoice or within 14 days of notice of the DEQ modification or DEQ-directed additional work. DEQ and both Respondents then shall make a good-faith effort to resolve the disagreement within 14 days of Respondent's written objection. At the end of the 14-day period, DEQ shall provide Respondents with a written statement of its position from the DEQ Northwest Region Cleanup Manager. If a Respondent still disagrees with DEQ's position, that Respondent shall provide Respondent's position and rationale in writing to the DEQ Northwest Region Administrator, within 14 days of receipt of DEQ's position from the Cleanup Manager. The Region Administrator may discuss the disputed matter with Respondents and, in any event, shall provide Respondents with DEQ's final position in writing as soon as practicable after receipt of Respondent's written position. DEQ's final position regarding the disputed matter shall be enforceable under this Consent Order.

(2) DEQ approval or modification of the RI workplan required under the SOW shall not be subject to dispute resolution under this Subsection, but shall otherwise be subject to the provisions of Subsection 7.K.

(3) Respondents shall not be required to perform disputed work until the dispute is resolved under these dispute resolution procedures. A Respondent's invocation of dispute resolution under paragraph (1) of this subsection shall not excuse or delay Respondents' performance of work unrelated to the disputed matter.

M. Stipulated Penalties

(1) Subject to Subsections 7.J. and 7.L., upon any violation by Respondents of any requirement of this Consent Order, and upon Respondents' receipt from DEQ of written notice of violation, Respondents shall pay the stipulated penalties set forth in the following schedule:

(a) $5,000 for the first week of violation or delay and $5,000 per day of violation or delay thereafter, for failure to provide access or records in accordance with Subsection 7.B. or 7.F.

(b) $5,000 for the first week of violation or delay (but not exceeding $2,000 for any one day during the first week) and $2,000 per day of violation or delay thereafter, for:

(i) failure to submit a final workplan, addressing in good faith DEQ's comments on the draft workplan or incorporating DEQ modifications to the workplan, in accordance with the SOW's schedule and terms;

(ii) failure to perform work in accordance with an approved workplan's schedule and terms;

(iii) failure to perform additional work required by DEQ under Subsection 5.B.; or

(iv) failure to submit a final report, addressing in good faith DEQ's comments on the draft report or incorporating DEQ modifications to the report, in accordance with an approved work plan's schedule and terms.

(c) $500 for the first week of violation or delay and $500 per day of violation or delay thereafter, for:

(i) failure to submit a good faith draft workplan in accordance with the SOW's schedule and terms;

(ii) failure to submit progress reports in accordance with Subsection 7.G.; or

(iii) any other violation of the Consent Order, SOW, or an approved workplan.

(2) Violations arising out of the same facts or circumstances or based on the same deadline shall be treated as one violation per day.

(3) Within 30 days of receipt of DEQ's written notice of violation, Respondents either shall pay the amount of such stipulated penalty assessed by check made payable to the "State of Oregon, Hazardous Substance Remedial Action Fund" , or request a contested case regarding the penalty assessment in accordance with Subsection 7.M.(3). Respondents shall pay simple interest of 9% per annum on the

unpaid balance of any stipulated penalties, which interest shall begin to accrue at the end of the 30-day payment period.

(4) Respondents may request a contested case hearing regarding the penalty assessment, in accordance with OAR Chapter 340 Division 11. The scope of any such hearing shall be consistent with the stipulations set forth in Section 2 of this Consent Order; shall be limited to the occurrence or non-occurrence of the alleged violation; and shall not review the amount of the penalty assessed. Penalties shall not accrue pending any contested case regarding the alleged violation.

N. Enforcement of Consent Order and Reservation of Rights

(1) In lieu of stipulated penalties under Subsection 7.M., DEQ may assess civil penalties under ORS 465.900 for Respondents' failure to comply with this Consent Order . Penalties shall not accrue pending any contested case regarding the alleged violation. In addition to penalties, DEQ may seek any other available remedy for failure of Respondents to comply with any requirement of this Consent Order, including but not limited to termination of this Consent Order or court enforcement of this Consent Order.

(2) Subject to Section 2, Respondents do not admit any liability, violation of law, or factual or legal findings, conclusions, or determinations made by DEQ under this Consent Order.

(3) Subject to Subsections 2.G. and 7.0., nothing in this Consent Order shall prevent Respondents from exercising any rights of contribution or indemnification

Respondents might have against any person regarding activities under this Consent Order.

O. Indemnification

(1) Each Respondent shall save and hold harmless the State of Oregon and its commissions, agencies, officers, employees, contractors, and agents, and indemnify the foregoing, from and against any and all claims arising from acts or omissions related to this Consent Order by that Respondent or its officers, employees, contractors, agents, receivers, trustees, or assigns. DEQ shall not be considered a party to any contract made by Respondents or their agents in carrying out activities under this Consent Order.

(2) To the extent permitted by Article XI Section 7 of the Oregon Constitution and by the Oregon Tort Claims Act, the State of Oregon shall save and hold harmless Respondents and their officers, employees, contractors, and agents, and indemnify the foregoing, from and against any and all claims arising from acts or omissions related to this Consent Order of the State of Oregon or its commissions, agencies, officers, employees, contractors, or authorized representatives (excepting acts or omissions constituting DEQ approval of Respondents' activities under this Consent Order). Respondents shall not be considered a party to any contract made by DEQ or its authorized representatives in carrying out activities under this Consent Order.

P. Parties Bound

This Consent Order shall be binding on the parties and their respective successors, agents, and assigns. The undersigned representative of each party certifies that he or she is fully authorized to execute and bind such party to this Consent Order. No change in ownership or corporate or partnership status relating to the facility shall in any way alter Respondents' obligations under this Consent Order, unless otherwise approved in writing by DEQ. Respondents shall notify and provide a copy of this Consent Order to any prospective successor, purchaser, lessee, assignee, or mortgagee of the facility during the term of this Consent Order.

Q. Modification

DEQ and Respondents may modify this Consent Order by mutual written agreement.

R. Effective Date

The effective date of this Consent Order shall be the date of signature by the DEQ Northwest Region Division Administrator.

S. NPL Listing

In the event that the Wacker Property becomes part of a federal NPL site, DEQ will cooperate with Respondents to encourage EPA to accept satisfactory and complete performance under this Consent Order as fulfillment of Respondents' obligation to perform the same work under any subsequently-issued EPA order or consent decree. If EPA does not agree that such performance under this Consent Order

fulfills EPA-imposed obligations, the Consent Order may be modified pursuant to Subsection 7.Q. or terminated at the election of DEQ or either Respondent. Notwithstanding the foregoing, if the Portland Harbor area becomes part of a NPL site, but (1) the Wacker Property is not itself included in the area expressly covered by the NPL listing (e.g., the Harbor is listed but upland sites are not), or (2) DEQ remains lead agency with respect to the Wacker Property, this Consent Order shall remain in full force and effect; however, if EPA orders any conflicting or overlapping activities, this Consent Order shall be modified, as necessary, to prevent conflicting or duplicative obligations. Any other additional EPA-imposed obligations may be addressed by modification of this Consent Order under Subsection 7.Q. or by separate agreement or order.

8. Duration

This Consent Order shall be deemed satisfied upon completion of work required under this Consent Order and payment by Respondents of any and all outstanding oversight costs and penalties. DEQ shall determine whether work under this Consent Order is satisfactorily completed and, if so, this Consent Order shall be terminated, by letter issued within 60 days of receipt of the last deliverable required from Respondents under this Consent Order, or as soon thereafter as reasonably practicable.

9. Signatures

STIPULATED, AGREED, and APPROVED for issuance:

Wacker Siltronic Corporation

Respondent

By: _____ Date: _____
(Signature)

_____
(Name)

_____
(Title)



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STIPULATED, AGREED, and APPROVED for issuance:

Northwest Natural Gas Company

Respondent

By: _____ Date: _____
(Signature)

_____
(Name)

_____
(Title)



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STIPULATED, AGREED, and so ORDERED:

State of Oregon
Department of Environmental Quality

By: _____ Date: _____
Neil Mullane
Northwest Region Division Administrator



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**ATTACHMENT B**
**SCOPE OF WORK FOR**
**REMEDIAL INVESTIGATION AND SOURCE CONTROL MEASURES**

## I. SCHEDULE

Respondents shall submit for DEQ review and approval a Remedial Investigation (RI) work plan and subsequent plans and reports that address all elements of this Scope of Work (SOW). Elements of the SOW may be addressed by alternative means or by using existing data or information to the extent that the data are applicable, meet the objectives of the RI, and are of acceptable QA/QC.

All work required under this Order shall be performed in accordance with the schedule below:

| | |
|---|---|
| **Draft Pre-RI Assessment Work Plan (if Respondents elect to perform a Pre-RI Assessment)** | A draft Pre-RI Assessment Work Plan shall be submitted to DEQ within 45 days of the issuance of this Order. |
| **DEQ Review and Comment** | To Respondents after receipt of draft Pre-RI Assessment Work Plan. |
| **Final Pre-RI Assessment Work Plan** | To DEQ within 30 days of receipt of DEQ comments on draft Pre-RI Assessment Work Plan. |
| **Initiation of Pre-RI Assessment** | Pre-RI Assessment to be completed within 90 days of DEQ approval of final Pre-RI Assessment Work Plan. |
| **Pre-RI Assessment Report** | To DEQ within 90 days of completion of Pre-RI Assessment. |
| **RI Scoping Document** | An RI Scoping Document shall be submitted to DEQ within 45 days of issuance of this order or, if a Pre-RI Assessment is performed, within 45 days of DEQ determination that an RI is necessary, based on the results of a Pre-RI Assessment. |
| **DEQ Review and Comment** | To Respondents after receipt of RI Scoping Document |
| **Draft RI Work Plan** | To DEQ within 60 days of receipt of DEQ comments on RI Scoping Document. |
| **DEQ Review and Comment** | To Respondents after receipt of Draft RI Work Plan. |
| **Final RI Work Plan** | To DEQ within 30 days of receipt of DEQ comments on draft RI Work Plan. |
| **Initiation of RI** | Site Characterization to be completed within 6 months of DEQ approval of final RI Work Plan. |

| | |
|---|---|
| **Technical Memorandum on Source Control Measures** | To DEQ within 60 days of completion of site characterization activities. |
| **DEQ Review and Comment** | To Respondents after receipt of Technical Memorandum on Source Control Measures. |
| **Preliminary Site Characterization Summary** | To DEQ within 90 days of completion of site characterization activities. |
| **DEQ Review and Comment** | To Respondents after receipt of Preliminary Site Characterization Summary. |
| **Preliminary Design of Source Control Measures** | To DEQ within 60 days of DEQ determination that Source Control Measures are necessary. |
| **DEQ Review and Comment** | To Respondents after receipt of Preliminary Design of Source Control Measures. |
| **Final Design of Source Control Measures** | To DEQ within 30 days of receipt of DEQ comments on Preliminary Design of Source Control Measures. |
| **Initiation of Source Control Measures** | Source Control Measures to be initiated within 6 months of DEQ approval of Final Design of Source Control Measures. |
| **Draft Phase II RI Work Plan Supplement** | To DEQ within 60 days of DEQ determination that additional site characterization activities are necessary. |
| **DEQ Review and Comment** | To Respondents after receipt of Draft Phase II RI Work Plan Supplement. |
| **Final RI Phase II RI Work Plan Supplement** | To DEQ within 30 days of receipt of DEQ comments on Draft Phase II RI Work Plan Supplement. |
| **Initiation of Phase II RI** | To be completed within six months of DEQ approval of Phase II RI Work Plan Supplement. |
| **Draft RI Report** | To DEQ within six months of completion of all site characterization activities. |
| **DEQ Review and Comment** | To Respondents after receipt of Draft RI Report. |
| **Final RI Report** | To DEQ within 45 days of receipt of DEQ comments on Draft RI Report. |

Additional work plans and work plan amendments are subject to DEQ review and approval and shall be processed according to schedules negotiated between the parties at the time of each phase change or task addition. Respondents shall

initiate and complete work according to the schedule specified in the applicable approved work plan or amendment.

## II. OBJECTIVES

Work performed under this Agreement shall complement and incorporate existing information regarding the Wacker Siltronic Corporation and GASCO facilities and shall be completed in coordination with the ongoing remedial investigation at the adjoining GASCO facility with the following specific objectives. For purposes of this Scope of Work, the "facility" shall exclude that portion of the Wacker Siltronic Corporation facility that is below the mean high-water mark of the Willamette River. The parties acknowledge that a separate Portland Harbor Sediment RI/FS is proceeding with respect to the portion of the Willamette River below the mean high-water mark, and it is not the purpose of this Scope of Work to duplicate any of that work:

A. Identify and characterize all past and present hazardous substance source areas at the Wacker Siltronic Corporation facility. Source areas shall be characterized through a review of historical information and the collection of environmental samples for chemical, geotechnical, and other analyses. The evaluation of source areas shall focus on upland operations that may have resulted in a release of hazardous substances.

B. Evaluate all past and present contaminant migration pathways at the Wacker Siltronic Corporation facility. Key elements relevant to contaminant migration include, but are not limited to, the rate and direction of groundwater flow, subsurface contaminant migration to the Willamette River, overland contaminant migration to the Willamette River, storm water discharge to the Willamette River, direct and indirect release to the Willamette River, preferential migration pathways, volatilization, dust entrainment, and riverbank seepage.

C. Determine the nature, extent, and distribution of hazardous substances in affected media at the Wacker Siltronic Corporation facility. This analysis should focus on the vertical and horizontal extent of source area contamination, groundwater contamination, and surface and subsurface soil contamination.

D. Identify all current and reasonably likely future human and ecological receptors in the locality of the Wacker Siltronic Corporation facility. Receptors shall include human and ecological receptors that may be exposed to hazardous substances in the locality of the facility. This analysis should consider all relevant contaminant migration pathways and the nature, extent and distribution of hazardous substances in affected media.

E. Collect sufficient data and historical information to allow the identification of possible areas of sediment contamination adjacent to the Wacker Siltronic Corporation facility. Areas of



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potential sediment contamination will be characterized through a Portland Harbor sediment investigation conducted outside this order. Data collection and evaluation shall consider the potential for contaminant migration to the Willamette River and over or in-water releases of hazardous substances resulting from current and historic operations at the Wacker Siltronic Corporation facility. Respondents may be required to perform limited sediment or benthic sampling adjacent to the facility as necessary to address an objective of this Scope of Work.

F. Evaluate the risk to human health and the environment from releases of hazardous substances at or from the Wacker Siltronic Corporation facility through the performance of human health and ecological risk assessments.

G. Identify hot spots of contamination, if any, at the Wacker Siltronic Corporation facility.

H. Generate or use data of sufficient quality for site characterization and risk assessment at the Wacker Siltronic Corporation facility.

I. Develop the information necessary to evaluate and design necessary source control measures to address contaminant releases from the Wacker Siltronic Corporation facility.

J. Implement necessary source control measures to address contaminant releases from the Wacker Siltronic Corporation facility.

**III. MONTHLY REPORTS**

Two (2) copies of a monthly report shall be submitted to DEQ by the 15th day of the month following the reporting period. The monthly reports shall summarize activities performed, data results collected or received, problems encountered or resolved during the previous month, and activities planned for the upcoming month.

**IV. Pre-RI Assessment Work Plan and Report**

Respondents shall submit a Pre-RI Assessment Work Plan for DEQ review and approval. The primary purpose of the Pre-RI assessment is to determine which media and pathways (e.g., groundwater, surface water, air, and direct contact) are affected by site related hazardous substances. The Pre-RI Assessment shall include a review of the facility history, review of current facility conditions, and may include focused sampling activities, to assess potential past and present sources of hazardous substances and determine if there has been a release from these sources to surface water or sediments, as appropriate.

The Pre-RI Assessment Work Plan shall describe the objectives, deliverables, schedule, and specific tasks that will be performed for the Pre-RI

Assessment. If the Pre-RI Assessment includes sampling, the work plan shall describe the sampling locations and the methodologies that will be used for the sampling and analysis.

The Pre-RI Assessment report will present the results of the Pre-RI Assessment including figures and tables presenting the results of any sampling and analysis. The report will present conclusions regarding the likelihood of past or present source(s) and pathway(s) for the release of hazardous substances to sediments adjacent to Respondents' facility and whether a re-evaluation of the priority of Respondents' facility is appropriate.

The results of the Pre-RI Assessment shall be used to determine whether further action is needed to assure protection of present and future public health, safety and welfare, or the environment. No further RI work regarding sediments shall be required under this Order and SOW if, based on historical information and the results of the Pre-RI Assessment or subsequent facility investigation, DEQ reasonably determines that there is no likely past or present source and pathway for the release of hazardous substances to surface water or sediments at or from Respondents' facility for which DEQ could require a removal action or remedial investigation under ORS 465.200 et seq. Further, should the pre-RI assessment or subsequent facility investigation provide enough information to re-evaluate the priority of the facility, Respondents may request that DEQ perform this evaluation. Should it be determined by DEQ that the facility no longer presents a high priority threat to present and future public health, safety, and welfare or the environment, no further RI work with respect to the uplands portions of the facility shall be required under this Order and SOW.

## V. RI SCOPING DOCUMENT

Respondents shall prepare an RI Scoping Document. The RI Scoping Document shall include a comprehensive review of the history, previous and ongoing environmental investigations, physiographic features, biological resources and demographic characteristics at both the Wacker Siltronic Corporation facility and the adjoining former GASCO facility. The RI Scoping Document shall present a proposed approach for completing a remedial investigation based on a review of existing information. The proposed RI approach shall address soil, groundwater, surface water, sediments, and air. The proposed RI approach will provide the framework for the RI Work Plan and will include, at a minimum, a summary of data collected to date, a conceptual site model (including a conceptual site hydrogeologic model), and a description of RI goals and objectives. The RI Scoping Document shall demonstrate that the proposed RI approach is adequate to meet the schedule specified in this SOW. The RI proposal shall consider methodologies presented in the Portland Harbor Sediment Management Plan and the draft Portland Harbor Sediment Investigation Work Plan dated March 31, 2000.

## VI. REMEDIAL INVESTIGATION WORK PLAN

A remedial investigation work plan shall be submitted according to the schedule specified in Section I above. The work plan shall be developed in accordance with applicable Oregon Administrative Rules (OAR 340-122-010 through -115), DEQ guidance, and the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, OSWER Directive 9355.3-01, 1988, as appropriate. Existing data may be used if it meets data quality objectives for the RI. The results of the RI will be used to guide data collection efforts performed as part of the Portland Harbor sediment investigation outside this Order. The submitted work plan shall include, but not be limited to, the following items:

### A. PROJECT MANAGEMENT PLAN

The RI work plan shall include a project management plan. The project management plan shall include a schedule for submittal of all documents and implementation of all proposed activities and phases pertaining to this Scope of Work consistent with the schedule specified in Section I; a description of the personnel (including subcontractors, if known) involved in the project, and their respective roles in the project; and a discussion of how approved variations from the approved work plan will be managed.

### B. SITE DESCRIPTION

The RI work plan shall include a discussion of the current understanding of the physical setting of the facility and surrounding area; the facility history; hazardous substance and waste management history; facility operations conducted on, in, over, or adjacent to the Willamette River, and current facility conditions.

### C. SITE CHARACTERIZATION PLAN

The RI work plan shall include a site characterization plan. The site characterization plan shall be consistent with DEQ guidance and the requirements specified in OAR 340-122-080. The site characterization plan shall include, but not be limited to, characterization of the hazardous substances, characterization of the facility, identification of potential receptors, and the collection and evaluation of information relevant to the identification of hot spots of contamination, and shall address the following:

1. **Soils**

Objective: To identify and characterize releases of hazardous substances from the facility to soils.

Scope: The plan shall supplement previous soil sampling at the Wacker Siltronic Corporation and former GASCO facilities. The



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plan shall address all areas of the facility which could potentially have received spills, have received leaks from tanks or piping, have been used for waste treatment or disposal, or have been affected by contaminated surface water or storm water runoff, and all other areas of the facility where soil contamination is known or suspected.

Procedures: The plan shall be designed and conducted to determine the vertical and lateral extent of soil contamination, determine the extent to which soil contamination may contribute to Willamette River sediment contamination, characterize the facility geology, determine the physical and chemical soil characteristics relevant to the RI, evaluate the potential for contaminant migration and gather the information necessary to identify hot spots of contamination. The plan shall include the proposed methodology for characterizing soil.

2. **Groundwater**

Objective: To identify and characterize releases of hazardous substances from the facility to groundwater.

Scope: The plan shall supplement previous investigations at the Wacker Siltronic Corporation and former GASCO facilities and shall identify and characterize all past, current and potential releases of hazardous substances to groundwater from the facility.

Procedures: The plan shall be designed and conducted to determine: the vertical and lateral extent of groundwater contamination, both on-site and, if applicable, off-site; estimate the rate of contaminant flux to the Willamette River; determine the extent to which free phase product is migrating to the Willamette River; characterize the facility hydrogeology; determine the physical and chemical characteristics of each water bearing zone relevant to the RI; evaluate the potential for contaminant migration through groundwater; and gather the information necessary to identify hot spots of contamination. The plan shall include the proposed methodology for characterizing groundwater. Alternative methods for characterizing groundwater should be considered to accelerate the RI. Monitoring wells and other holes must be drilled, constructed, and decommissioned in accordance with OAR Chapter 690, Division 240 and DEQ "Ground Water Monitoring Well, Drilling, Construction and Decommissioning" guidelines (DEQ 1992).

3. **Surface Water**

Objective: To identify and characterize releases of hazardous substances from the facility to surface water.

Scope: The plan shall supplement previous investigations at the Wacker Siltronic Corporation and former GASCO facilities and shall

identify and characterize all past, current, and potential impacts to surface waters from the facility.

Procedures: The plan shall be designed to: determine the extent to which surface water may have been impacted by releases of hazardous substances at the facility; determine the nature and extent of surface water contamination; characterize the facility hydrology; determine the physical and chemical surface water characteristics relevant to the RI including flow characteristics; evaluate the potential for contaminant migration and gather the information necessary to identify hot spots of contamination. The plan shall include the proposed methodologies for characterizing surface water.

4. **Sediments**

Objective: To identify and characterize releases of hazardous substances from the facility to sediments.

Scope: The plan shall supplement previous investigations at the Wacker Siltronic Corporation and former GASCO facilities, and shall identify and characterize all past, current, and potential releases of hazardous substances to sediments from the facility in a manner consistent with the Portland Harbor sediment investigation conducted outside this Order. Characterization of the nature and extent of sediment contamination is not required under this Order, but is contemplated to be completed through a Portland Harbor sediment investigation.

Procedures: The plan shall be designed to identify sources of sediment contamination from the facility, and characterize release mechanisms from the facility to sediments. The plan shall include the proposed methodology for characterizing releases to sediments and as applicable shall utilize methodologies presented in the Portland Harbor Sediment Management Plan and the draft Portland Harbor Sediment Remedial Investigation and Feasibility Study Work Plan dated March 31, 2000.

5. **Air**

Objective: To identify and characterize any release of hazardous substances to the air, from soil, surface water, or groundwater contamination at the facility.

Scope: The plan shall supplement previous investigations at the Wacker Siltronic Corporation and former GASCO facilities and shall identify and characterize all past, current, and potential releases (e.g. contaminated soil or groundwater) of hazardous substances to air.

Procedures: The plan shall include the proposed methodologies for evaluating air emissions using appropriate emission calculations and/or a field sampling program. The plan shall be designed to

delineate the nature and extent of contamination, characterize the site climatology, determine the physical and chemical air characteristics relevant to the RI, evaluate the potential for contaminant migration to the Willamette River and surrounding areas and gather the information necessary to identify hot spots of contamination.

6. **Identification of Current and Reasonably Likely Future Land and Water Use**

Objective: To identify current and reasonably likely future land and water uses in the locality of the facility excluding those of the Willamette River.

Scope: The plan shall be designed to identify current and reasonably likely future land and water uses for the purposes of identifying hot spots of contamination and conducting the baseline human health and ecological risk assessments based on OAR 340-122-080, DEQ Guidance, and the Portland Harbor Sediment Management Plan.

Procedures: The plan shall include the proposed methodology for identifying current and reasonably likely future land and water uses in the locality of the facility (excluding uses of the Willamette River).

## D. SAMPLING AND ANALYSIS PLAN (SAP)

Objective: To adequately document all sampling and analysis procedures.

Scope: In preparation of the SAP, the following guidance documents shall be utilized: Data Quality Objectives for Remedial Response Activities, EPA/540/G-87/004 (OSWER Directive 9355.0-7B), March, 1987; Test Methods for Evaluating Solid Waste, SW-846 and appropriate updates; and A Compendium of Superfund Field Operations Methods, EPA/540/P-87/001 (OSWER Directive 9355.0-14), December, 1987. The SAP shall address all topics listed in Environmental Cleanup Division Policy #760.000, Quality Assurance Policy.

Procedures: The work plan shall include a (SAP). The SAP shall include (QA/QC) procedures for both field and lab procedures. The SAP shall be sufficiently detailed to function as a manual for field staff.

## E. HEALTH AND SAFETY PLAN (HASP)

Objective: To establish policies and procedures to protect workers and the public from the potential hazards posed by a hazardous materials site.



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Scope: The HASP portion of the work plan shall comply with 29 CFR 1910.120 and OAR Chapter 437, Division 2.

Procedures: The HASP shall include a description of risks related to RI activities, protective clothing and equipment, training, monitoring procedures, decontamination procedures, and emergency response actions.

**F. MAPS**

The work plan shall include a scaled map or maps of the facility, which clearly shows facility topography, on-site structures, subsurface utility lines, waste storage and disposal areas, location of sensitive environments, and proposed sampling locations.

**G. WORK PLAN FOR EVALUATION AND IMPLEMENTATION OF SOURCE CONTROL MEASURES**

Objective: To evaluate, design and implement necessary source control measures to address contaminant migration to the Willamette River.

Scope: The plan shall gather sufficient information to evaluate, design, and implement necessary source control measures.

Procedures: The plan shall be designed and conducted to characterize all release mechanisms to the Willamette River. Characterization data shall be adequate to evaluate, design, and implement necessary source control measures. Source control measures shall address contaminant migration to the river through overland transport, storm water runoff, free phase product migration, direct release, and/or dissolved groundwater contaminant migration.

**H. RISK ASSESSMENT WORK PLAN**

1. **Upland Human Health Risk Assessment**

Objective: To evaluate the collective demographic, geographic, physical, chemical, and biological factors at the facility, for the purposes of: characterizing current or reasonably likely future risks to human health as a result of a threatened or actual release(s) of a hazardous substance at or from the facility; documenting the magnitude of the potential risk at the facility; supporting risk management decisions; and establishing remedial action goals if necessary.

Scope: The human health risk assessment shall evaluate risk in the context of current and reasonably likely future land and water uses and in the absence of any actions to control or mitigate these risks (i.e., under an assumption of no action). The human health risk assessment portion of the work plan shall be developed



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based on the requirements specified in OAR 340-122-084, DEQ guidance, and the Risk Assessment Guidance for Superfund - Human Health Evaluation Manual Part A, United States Environmental Protection Agency (EPA) Interim Final, July 1989 (RAGS-HHEM). The work plan shall use Exhibit 9-1 of the RAGS-HHEM as a framework for discussing the methodologies and assumptions to be used in assessing the potential human health risks at the facility.

Procedure: The plan shall describe the different tasks involved in preparing the human health risk assessment. The human health risk assessment can be completed using either deterministic or probabilistic methodologies. If probabilistic methodologies are to be used, then Respondents shall obtain DEQ approval of the proposed risk protocol before the commencement of a probabilistic risk assessment.

The upland human health risk assessment shall be designed to achieve the following:

a. Develop appropriate exposure units considering the nature, extent, and distribution of contamination and the reasonably likely future land and water use in the locality of the facility;
b. Establish data quality objectives for each exposure unit identified;
c. Collect data appropriate to satisfy the data quality objectives for each exposure unit;
d. Identify contaminants of interest for each media of concern;
e. Develop exposure scenarios based on current and reasonably likely land use, facility features, and populations potentially exposed;
f. Identify appropriate exposure factors for all exposure pathways to be evaluated;
g. Identify the appropriate toxicity factors for all exposure pathways to be evaluated; and
h. Quantify the risks to human health at the facility.

2. **Upland Ecological Risk Assessment**

Objective: To evaluate the collective demographic, geographic, physical, chemical, and biological factors at the facility, for the purposes of: characterizing current or reasonably likely future risks to the environment as a result of a threatened or actual release(s) of a hazardous substance at or from the facility; quantifying the potential risk at a facility; supporting risk management decisions; and establishing remedial action goals if necessary.

Scope: The ecological risk assessment shall evaluate risk in the context of current and reasonably likely future land and water uses and in the absence of any actions to control or mitigate these risks (i.e., under an assumption of no action). The ecological risk assessment shall use a tiered approach (with four

levels) to produce a focused and cost-effective assessment of risk. The ecological risk assessment work plan shall be developed based on the requirements specified in OAR 340-122-084 and DEQ guidance.

Procedure: The plan shall describe the different tasks involved in preparing the ecological risk assessment. Ecological risk assessments shall include a level I scoping plan and a level II screening plan; and may include a level III baseline plan and a level IV field baseline plan. The level III and level IV baseline plans shall include an exposure analysis, an ecological response analysis, a risk characterization, and an uncertainty analysis, as required by OAR 340-122-084(3). The ecological risk assessment can be completed using either deterministic or probabilistic methodologies. If probabilistic methodologies are to be used, then Respondents shall obtain DEQ approval of the proposed risk protocol before the commencement of a probabilistic risk assessment.

Terrestrial habitats and receptors shall be evaluated through the following approach:

a. Complete a Level I Scoping assessment per ODEQ guidance for the terrestrial portion of the facility.
b. Make a preliminary determination of locality of the facility with respect to terrestrial receptors and current and potential future exposure to facility-related contaminants.
c. Determine potential for presence/absence of terrestrial threatened or endangered species.

## VII. PHASE I SITE CHARACTERIZATION SUMMARY

The Phase I Site Characterization Summary shall summarize and present preliminary results of the Site Characterization. The summary shall be adequate to allow DEQ to determine whether additional site characterization activities are necessary to complete the RI.

The Phase I Site Characterization Summary shall be based on the results of the remedial investigation and include the following elements:

A. Introduction and Purpose

B. Summary of Site Characterization Activities

C. Summary of Investigation Results

D. Summary of Data Gaps

E. Recommendations and Conclusions

## VIII. TECHNICAL MEMORANDUM ON SOURCE CONTROL MEASURES

The Technical Memorandum on Source Control Measures shall present all data relevant to the characterization of migration pathways from the site to the Willamette River. The Technical Memorandum shall be developed based on Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA, EPA 540/P-91/001 (1993). The Technical Memorandum shall identify any additional data collection activities to be performed during the Phase II RI necessary to complete the characterization of migration pathways. If no additional data are required, the Technical Memorandum shall present and evaluate a set of alternatives for controlling releases to the Willamette River.

The Technical Memorandum on Source Control Measures shall be based on the results of the site characterization and include the following elements:

A. Identification of migration pathways from site to the Willamette River.

B. Characterization of migration pathways from site to the Willamette River

C. Estimate of magnitude of contaminant migration from the site to the Willamette River through overland transport, storm water runoff, free phase product migration, direct release, and dissolved groundwater contaminant migration.

D. Identification of alternatives for source control measures to prevent the ongoing migration of contaminants to the Willamette River.

E. Evaluation of alternatives for source control measures to prevent the ongoing migration of contaminants to the Willamette River.

## IX. PHASE II REMEDIAL INVESTIGATION WORK PLAN

Objective: To collect sufficient information to complete the remedial investigation at the facility.

Scope: The Phase II RI Work Plan shall supplement previous investigations at the facility. The work plan shall be designed complete the characterization of all past, current, and potential releases of hazardous substances at or from the facility.

Procedures: If DEQ determines that additional characterization activities are required to complete the RI, Respondents shall prepare a Phase II RI work plan that addresses all data gaps identified by DEQ. The Phase II RI work plan shall describe all characterization procedures necessary to complete the RI and demonstrate that proposed characterization procedures are sufficient to complete the RI.

## X. SOURCE CONTROL MEASURES DESIGN PLAN

Objective: To design necessary source control measures to address contaminant migration to the Willamette River.

Scope: The Source Control Measures Design Plan shall be adequate to implement necessary source control measures to address contaminant migration to the Willamette River.

Procedures: The Source Control Measures Design Plan shall be developed in conformance this Scope of Work and, as appropriate, EPA's "Superfund Remedial Design Remedial Action Guidance", OSWER Directive 9355.0-4A, 1986; "Guidance on Expediting Remedial Design and Remedial Action", OSWER Directive 9355.5-02; and any additional guidance documents as directed by DEQ.

The Source Control Measures Design Plan shall include, at a minimum, the following items:

A. Description of proposed Source Control Measures.
B. Proposed schedule for implementation of source control measures.
C. Project organization and identification of reporting relationships, duties, responsibilities, lines of communication, and authorities.
D. Identification and description of design objectives.
E. Identification and description of design criteria and performance standards that shall be applied to the source control measures conducted by Respondents.
F. Identification and listing of federal, state, or local laws, regulations, or guidance applicable to or associated with the source control measures and an explanation of how they will be incorporated into the design and implementation of the source control measures.
G. An identification of permitting requirements and a proposal for satisfying or exempting any applicable requirements.
H. Identification and description of any site access agreements required to implement source control measures.
I. Identification and description of any property, utility, right-of-way, topographic, or other site surveys required.
J. A description of any special design/implementation problems anticipated and how they will be addressed. Include any special technical problems, anticipated community relations problems, access, easements, rights-of-way, transportation, utilities, and logistics problems.
K. A description of all source control measure activities to be performed.
L. Procedures for documentation/validation of source control measures.
M. Description of construction methods and equipment to be used.
N. Description of proposed control measures to minimize releases of hazardous substances to all environmental media during construction or installation activities.
O. Description of any measures necessary to control surface water runoff during construction.

P. Identification and description of dust control and noise abatement measures to minimize and monitor environmental impacts of construction or installation activities.

Q. Identification and description of any site security measures necessary to minimize exposure to hazardous situations during implementation of source control measures.

## XI. REMEDIAL INVESTIGATION REPORT

The Remedial Investigation report shall follow the outline in Table 3-13 (page 3-30 - 3-31) in the CERCLA RI/FS guidance, as applicable, and address the items listed below:

A. **Executive Summary**.

B. **Introduction.**

C. **Facility Background**.

A discussion and supporting maps of facility operations, facility description, facility setting, and current and reasonably likely future land and water uses.

D. **Study Area Investigation**.

A discussion of the investigative procedures and results for soil, groundwater, surface water, sediments, and air.

E. **Summary and Conclusions.**

A discussion of the nature, extent, distribution and environmental fate and transport of contaminants in soil, groundwater, surface water, sediments, and air.

F. **Appendices**.

Detailed information supporting the results of the Remedial Investigation shall be submitted in the Appendices of the report.

## XII. RISK ASSESSMENT REPORT

A. **Human Health Risk Assessment Report**

The results of the human health risk assessment shall follow DEQ risk assessment guidance for human health and RAGS-HHEM Part A.

B. **Ecological Risk Assessment Report**

The main sections of the ecological risk assessment report shall follow specific DEQ guidance for report formats at each level (I-III).

**XIII. DISTRIBUTION.**

A. Three (3) bound copies and one (1) unbound copy of all plans, reports (except Quarterly Reports) and memoranda shall be submitted to DEQ.

B. DEQ requests that all copies be duplex printed on recycled paper.

TARLOW JORDAN & SCHRADER
ATTORNEYS AT LAW

VIA FEDERAL EXPRESS

June 27, 2000

Cathryn Young
Wacker Siltronic, Corp.
7200 NW Front Ave
Portland OR 97210-3676

Re: Walker Siltronic Corporation/Portland Harbor
Our File No. 46454/29619

Dear Cathryn:

In accordance with the voice mail message I left you this afternoon, enclosed please find a copy of correspondence dated June 26, 2000 from Kurt Burkholder, Assistant Attorney General, together with a proposed joint Administrative Consent Order and Scope of Work with respect to Walker Siltronic Corporation and Northwest Natural Gas Company.

I am hopeful that you can review the enclosed on Wednesday, June 28, 2000 and contact me with your comments as I am out of the office from June 29, 2000 through July 4, 2000.

I look forward to hearing from you at your earliest convenience.

Very truly yours,

TARLOW JORDAN & SCHRADER

Christopher L. Reive

Enclosure

Oregon
John A. Kitzhaber, M.D., Governor

**Department of Environmental Quality**
Northwest Region
2020 SW Fourth Avenue
Suite 400
Portland, OR 97201-4987
(503) 229-5263 Voice
TTY (503) 229-5471

May 28, 2002

Ms. Cathryn Young
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, OR 97210

Re: Water Level Measurements – Atofina Site

Dear Cathryn:

Enclosed are groundwater level measurement obtained on April 2, 2002 at the Atofina site. These groundwater level measurements were obtained as part of the RI/FS at the Atofina site. We have yet to receive water level measurements obtained by Wacker Siltronic Corporation personal. Please forward these water level measurements at your earliest convenience.

Thank you for your cooperation in this matter. Please contact me at (503) 229-5648 if you have any questions.

Sincerely,

Eric L. Blischke
Project Manager
Voluntary Cleanup and Portland Harbor Section

cc: Mike Rosen, NWR/DEQ
Rod Struck, NWR/DEQ (w/enc.)
Rob Ede, Hahn and Associates (w/enc.)
Scott Krantz, AMEC (w/enc.)



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ATOFINA

ATOFINA Chemicals, Inc.

RECEIVED
MAY 24 2002
DEPT OF ENVIRONMENTAL QUALITY
NORTHWEST REGION

May 23, 2002

Eric Blischke
Coordinator, Portland Harbor
Oregon Department of Environmental Quality
2020 S.W. 4th Avenue
Portland, OR 97201

Subject: Focused Spring 2002 Groundwater Characterization Event
Water Level Measurements
ATOFINA Portland Plant

Dear Mr. Blischke:

Attached, please find a table summarizing the depth-to-water measurements collected April 2, 2002 and calculated groundwater elevations at the ATOFINA site. Locations of the monitoring wells are shown on the attached figure. These data were collected according to the procedures outlines in the *Supplemental Groundwater Monitoring Work Plan II*, submitted to the Oregon Department of Environmental Quality (DEQ) on March 21, 2002, and approved by DEQ in a letter dated March 26, 2002. ATOFINA understands that DEQ coordinated a synchronous water level monitoring event among several property owners. Therefore, ATOFINA is providing the groundwater elevation data in advance of the analytical data obtained during the groundwater monitoring event. The groundwater elevation data will also be submitted (along with the validated analytical data) in an upcoming quarterly report.

If you have any questions, please feel free to contact me at (503) 225-7210.

Sincerely,
ATOFINA Chemicals, Inc.

Larry D. Patterson
Environmental Manager

Attachments

cc: Claudia Powers, Ater Wynne
David Livermore, Exponent

**ATOFINA Chemicals, Inc.**
6400 N.W. Front Avenue
Portland, Oregon 97210
503-228-7655
www.AtofinaChemicals.com

## Table 1. April 2002 groundwater elevation monitoring data

| Monitoring Well | Well Casing Elevation[a] | Depth to Water | Groundwater Elevation |
|---|---|---|---|
| MWA-2 | 36.47 | 27.65 | 8.82 |
| MWA-3 | 37.46 | 28.33 | 9.13 |
| MWA-4 | 36.46 | 27.26 | 9.20 |
| MWA-5 | 37.07 | 28.61 | 8.46 |
| MWA-6r | 34.55 | 25.17 | 9.38 |
| MWA-7 | 34.29 | 7.95 | 26.34 |
| MWA-8i | 36.10 | 27.44 | 8.66 |
| MWA-9i | 36.81 | 28.06 | 8.75 |
| MWA-10i | 35.90 | 27.10 | 8.80 |
| MWA-11i | 34.50 | 24.74 | 9.76 |
| MWA-12i | 33.91 | 11.06 | 22.85 |
| MWA-13d | 37.06 | 28.37 | 8.69 |
| MWA-14i | 37.39 | 28.34 | 9.05 |
| MWA-15r | 34.11 | 24.48 | 9.63 |
| MWA-16i | 34.82 | 25.79 | 9.03 |
| MWA-17si | 37.20 | 28.07 | 9.13 |
| MWA-18 | 37.49 | 28.37 | 9.12 |
| MWA-19 | 38.00 | 29.13 | 8.87 |
| MWA-20 | 39.03 | 29.47 | 9.56 |
| MWA-21b | 36.84 | 27.80 | 9.04 |
| MWA-22 | 34.65 | 21.68 | 12.97 |
| MWA-23 | 34.86 | 9.40 | 25.46 |
| MWA-24 | 35.64 | 22.02 | 13.62 |
| MWA-25 | 35.72 | 25.49 | 10.23 |
| MWA-26 | 35.73 | 25.21 | 10.52 |
| MWA-27 | 34.92 | 25.32 | 9.60 |
| MWA-28i | 35.89 | 24.90 | 10.99 |
| MWA-29 | 35.24 | 26.63 | 8.61 |
| MWA-30 | 36.36 | 27.44 | 8.92 |
| MWA-31i | 36.38 | 29.19 | 7.19 |

[a] Well casing elevation in feet above City of Portland Datum.



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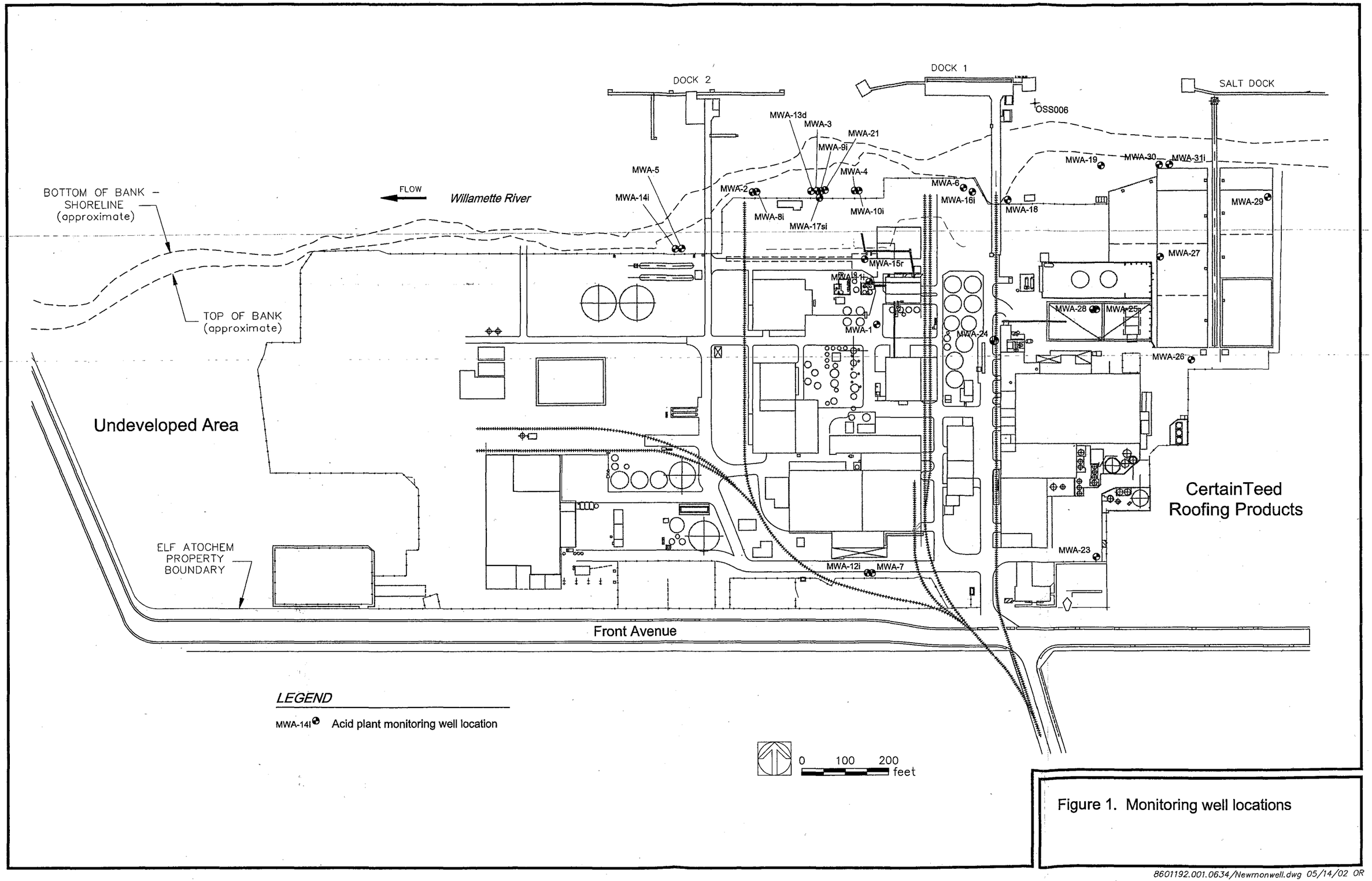


Figure 1. Monitoring well locations

8601192.001.0634/Newmonwell.dwg 05/14/02 OR

Oregon
John A. Kitzhaber, M.D., Governor

Department of Environmental Quality
Northwest Region
2020 SW Fourth Avenue
Suite 400
Portland, OR 97201-4987
(503) 229-5263 Voice
TTY (503) 229-5471

January 2, 2001

Mr. Bob Wyatt
Northwest Natural
220 N.W. Second Avenue
Portland, OR 97209

Re: Remedial Investigation Scoping Document –
Wacker Siltronic Corporation Property

Dear Bob:

The Oregon Department of Environmental Quality (DEQ) has reviewed the Remedial Investigation (RI) Scoping Document for the Wacker Siltronic Corporation Property (Wacker) site prepared on your behalf by Hahn and Associates. This document was received by DEQ on November 20, 2000 in accordance with DEQ order No. ECVC-NWR-00-27. In general, the RI scoping document describes an acceptable approach to characterization of the Wacker site. DEQ comments on the RI Scoping Document are presented below. It is DEQ's expectation that these comments will be folded into the RI work plan.

**General Comment**

DEQ acknowledges that the overall purpose of the RI at the Wacker site is to "determine the nature and extent of releases of hazardous substances to Willamette River sediments from certain property in Multnomah County, and to develop and implement source control measures to address such releases, if necessary." However, it should be noted that the Scope of Work (SOW) identifies specific RI objectives necessary to achieve the overall purpose. In particular, objective II.B. requires the identification and characterization of "all past and present hazardous substance source areas at the Wacker facility" with a focus "on upland operations that may have resulted in a release of hazardous substances," while objective II.C. requires the evaluation of "all past and present contaminant migration pathways at the Wacker facility." These objectives, as well as other objectives identified in the SOW, must be considered when designing the characterization approach to the Wacker site.

**Specific Comments:**

Section 5 - Potential Contaminant Sources:

- Hazardous substance releases associated with Wacker Siltronic Corporation operations should be included as potential contaminant sources. Information presented in DEQ's Strategy Recommendation or in the "Supplement to DEQ's Strategy Recommendation for



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the Wacker Siltronic Facility" (Bridgewater, 2000) should be used to identify potential sources and prioritize them for characterization. Hazardous substance releases that may require further characterization to assess their potential impact on the Willamette River include the 1984 trichloroethene (TCE) spill and miscellaneous acid spills. In addition, the Wacker site was extensively filled prior to site development. The possibility that some of this fill material may have been contaminated should be considered in the conceptual site model.

Section 6. – Summary of Previous Investigations:

- The investigation summary should include recent investigative efforts associated with the Rhone Poulenc RI/FS. These include the installation of cone penetrometer testing (CPT) borings, GeoProbe borings and monitoring wells on the Wacker site and adjoining Burlington Northern/Santa Fe Railroad property. These investigations have established the depth to basalt along the southern portion of the site and identified the presence of tars in shallow soils at the Wacker site.

Section 7.4.2 – Contaminants of Interest:

- The list of chemicals of interest should be expanded to include TCE (from the 1984 TCE release) and metals (mobilized by acid releases at the Wacker site or through biodegradation of petroleum based contaminants).

Section 7.4.3 – Transport and Fate:

- A section describing current and historic surface water features should be included in the preliminary conceptual site model. In addition to the identification of migration pathways associated with stormwater discharges at the Wacker site and preferential migration pathways resulting from the presence of underground utility corridors, the drainage ditch/outfall that runs along the southern and western property boundary must also be evaluated. It is known that shallow groundwater in the southwestern portion of the site discharges to North Doane Lake. Consequently, the drainage ditch/outfall may serve as a migration pathway for the transport of contamination from the site to the Willamette River.

Section 7.2 – Hydrogeological Conceptual Model:

- The hydrogeologic conceptual model should be supported with available information and appropriate figure. For example, the Remedial Investigation Work Plan appendices should include the following information:
    - Boring logs for Wacker monitoring wells WS-1 through WS-7
    - Boring logs for GASCO monitoring wells MW-5, MW-11, MW-12
    - Boring logs for GASCO explorations B-32, B-33, B-35
    - Boring logs of Wacker borings B-1B
    - Boring logs for Rhone-Poulenc Wells RP-01, RP-03 and RP-06
    - Schematic geologic cross sections parallel and perpendicular to the river bank

- Groundwater Elevation maps showing representative conditions at adjacent facilities (e.g., GASCO, Doane Lake Remnant area, Rhone-Poulenc).

Section 8 – Proposed RI Approach:

- It is DEQ's expectation that the RI will evaluate all upland activities that may have resulted in the release of a hazardous substances. Sampling activities should focus on determining if a release has occurred and if a pathway to surface water or sediments exists. If it is determined through the proposed sampling approach that a pathway from an identified contaminant source to the Willamette River exists, sampling in potential source areas will likely be required to evaluate the elimination of that source in conjunction with source control measures, identify hot spots of contamination and to assess the risk to human health and the environment.

Please have a work plan prepared which incorporates the above comments. Under the terms of Order No. ECVC-NWR-00-27, a work plan is due 60 days from receipt of these comments.

Please contact me at 229-5648 if you have any questions.

Sincerely,

Eric L. Blischke
Project Manager
Voluntary Cleanup and Portland Harbor Section

cc: Mike Rosen, NWR/DEQ
Rod Struck, NWR/DEQ
Kathryn Young, Wacker Siltronic Corporation

**Wacker Siltronic Corporation**

7200 NW Front Avenue
Portland, Oregon 97210
Phone: (503) 243-2020
Fax: (503) 219-7599 Central Engineering

# FACSIMILE TRANSMITTAL SHEET

**TO:** **Chris Reive**
**Tarlow Jordan & Schrader**

**FROM:** **Cathryn Young**

**FAX No:** **(503) 598-7373**

**DATE:** **January 3, 2001**

**NUMBER OF PAGES (including this page): 4**

**MESSAGE/SPECIAL INSTRUCTIONS:**

Re: Portland Harbor

[redacted]

SEE ALSO:
NW NATURAL GAS
Regulatory

AND
Portland HARBOR
Regulatory

SEE: STUDIES for
Remedial Investigation
Scoping Document
by Hahn + Assoc.

29

FOR YOUR INFORMATION
TARLOW, JORDAN & SCHRADER
11/11/00 Ege

STOEL RIVES LLP
ATTORNEYS

STANDARD INSURANCE CENTER
900 SW FIFTH AVENUE, SUITE 2600
PORTLAND, OREGON 97204-1268
Phone (503) 224-3380 Fax (503) 220-2480
TDD (503) 221-1045
Internet: www.stoel.com

November 10, 2000

RICHARD D. BACH
*Direct Dial*
(503) 294-9213
email rdbach@stoel.com

**Via Fax and U.S. Mail**

Michael E. Rosen, Ph.D
Oregon Department of Environmental Quality
Northwest Region
2020 SW Fourth Avenue, Ste. 400
Portland, OR 97201-4987

**Re: DEQ No. ECVC-NWR-00-27 - Wacker Siltronic Property**

Dear Mike:

This will confirm that Northwest Natural and Wacker Siltronic have agreed that Northwest Natural will perform the remedial investigation of contaminants that may have originated from Northwest Natural's activities and may be migrating to Willamette River sediments from the Wacker property, as required by the captioned Order.

Wacker has indicated that it is prepared to grant access to its property for such purposes.

Northwest Natural's Project Manager, Mr. Bob Wyatt, and its consultant, Mr. Rob Ede of Hahn and Associates, will be in contact with you as necessary in development of the Work Plan and other deliverables as appropriate.

Very truly yours,

Richard D. Bach

cc: Mr. Eric Blischke
Kurt Burkholder, Esq.
Ms. Sandra K. Hart
Mr. Robert J. Wyatt
Mr. Rob Ede
Chris Reive, Esq.

CLIENT'S COPY

PERSONAL DELIVERY

October 18, 2000

TARLOW JORDAN & SCHRADER
ATTORNEYS AT LAW

CHRISTOPHER L. REIVE
Admitted in Oregon and Washington

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chris.reive@tjslaw.com

Ms. Lydia Taylor
Acting Director
Oregon Department of Environmental Quality
811 SW 6th Ave
Portland OR 97204

Re: **In the Matter of Wacker Property**
DEQ No. ECVC-NWR-00-27
Our File No. 46454/29619

Dear Ms. Taylor:

As required by Section 6A(1) of the above-entitled Order, please be advised that Wacker Siltronic Corporation ("Wacker") plans to enlist the services of Bridgewater Group, Inc. and Stuart M. Brown, Senior Project Manager, as its qualified environmental professionals to supervise the Work to be performed by Wacker under the Order. Since Mr. Brown is known to your staff, there appears to be no need to provide a formal statement of his qualifications. However, if you require the same, please contact me and I will forward it to you.

As you are aware, Northwest Natural Gas Company and Wacker are negotiating with the intent to come to a mutually acceptable cooperation and cost-sharing agreement for the Work required by the Order. If these negotiations are successful, it is likely that the environmental professionals designated by Northwest Natural shall serve as the common Project Manager for purposes of the Order pursuant to Section 6D(2). However, Wacker plans to preserve its relationship with Mr. Brown to assist it in performing its responsibilities under such an agreement.

As soon as an agreement has been reached on this issue, a written designation of the Project Manager will be submitted.

Representatives of Wacker and its designated environmental professionals remain ready to meet with your staff at mutually convenient times in order to discuss preparation of the Work Plan and implementation of the Order.

Very truly yours,

TARLOW JORDAN & SCHRADER

/s/ CHRISTOPHER L. REIVE

Christopher L. Reive

cc: Walker Siltronic Corporation
Stuart M. Brown, via facsimile, 503-675-1960
Richard D. Bach, Esq.
Eric Blischke
Kurt Burkholder, Esq.

STOEL RIVES LLP
ATTORNEYS

STANDARD INSURANCE CENTER
900 SW FIFTH AVENUE, SUITE 2600
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October 16, 2000

RICHARD D BACH
*Direct Dial*
(503) 294-9213
email rdbach@stoel.com

**VIA FAX AND U.S. MAIL**

Ms. Lydia Taylor
Acting Director
Oregon Department of Environmental Quality
811 SW Sixth Avenue
Portland, OR 97204

Re: **DEQ No. ECVC-NWR-00-27**

Dear Ms. Taylor:

Please accept this letter as Northwest Natural Gas Company's notice of its intent, either individually or jointly with Wacker Siltronic Corporation, to comply with and satisfy the purpose of the captioned Order; *i.e.*, to determine the nature and extent of releases of hazardous substances to the Willamette River Sediments from the Wacker property, and to develop and implement source control measures to address such releases, if necessary.

As you are aware, a joint effort by Northwest Natural and Wacker will be dependent upon Wacker's affirmative intent to comply and the results of our current discussions toward a cooperation and cost-sharing agreement for the Work required by the Order. In the event that Wacker elects not to comply, or if our discussions are not successful, Northwest Natural is prepared to perform the Work by itself.

As required by Section 6.A(1) of the Order, please be advised that Northwest Natural will enlist the services of Hahn and Associates, Inc. and Robert Ede, R.G., Senior Project Manager, as the qualified environmental professionals to supervise the Work required by the Order. At such time as contractors and subcontractors are selected for specific tasks, we will advise you of their names and qualifications. Given that Mr. Ede has been the supervising environmental professional at the Gasco site for some time now, and is well known to your staff, there would appear to be no need to provide a statement of his qualifications.

STOEL RIVES LLP



In addition, we must note that the Order contains a number of factual inaccuracies and unsubstantiated assumptions At an appropriate time we will provide you with information with respect to such inaccuracies and assumptions, and we will respectfully insist that they be corrected for the record.

Representatives of Northwest Natural and its consultant stand ready to meet with your staff at mutually convenient times to discuss preparation of the Work Plan and implementation of the Order.

Very truly yours,

Richard D. Bach

cc: Sandra K. Hart
Michael Rosen, PhD
Eric Blischke
Robert Ede
Christopher Reive, Esq
Kurt Burkholder, Esq.
*(All by fax and U.S. Mail)*

FOR YOUR INFORMATION
TARLOW, JORDAN & SCHRADER
10/17/00 MDS

Routed for DB CLR

# STOEL RIVES LLP

ATTORNEYS

STANDARD INSURANCE CENTER
900 SW FIFTH AVENUE, SUITE 2300
PORTLAND, OREGON 97204-1268
Telephone (503) 224-3380
Fax (503) 220-2480

| | Name: | Fax No. | Company/Firm: | Office No. |
|---|---|---|---|---|
| | Lydia Taylor | 503-229-5300 | Oregon DEQ | 503-229-6124 |
| TO: | Sandi Hart | 503-721-2516 | Northwest Natural | 503-721-2478 |
| | Rob Ede | 503-227-2209 | Hahn & Associates | 503-796-0717 |
| | Eric Blischke | 503-229-6977 | Oregon DEQ | 503-229-5648 |
| | Christopher Reive | 503-598-7373 | Tarlow Jordan | 503-598-5544 |
| | Kurt Burkholder | 503-229-5797 | Oregon DOJ | 503-229-5725 |
| | Mike Rosen | 503-229-6899 | Oregon DEQ | 503-229-6712 |

FROM: Name: Richard D. Bach — Sender's Direct Dial: (503) 294-9213

Client: NNG — Matter: Environmental

DATE: October 16, 2000

No. of Pages (including this cover) 3

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COMMENTS:

Copies to follow in U. S mail.

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SCOEPA00010046

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August 4, 2000

RICHARD D. BACH
*Direct Dial*
(503) 294-9213
email rdbach@stoel.com

Kurt Burkholder, Esq.
Assistant Attorney General
Natural Resources Section
Oregon Department of Justice
1515 SW Fifth Avenue, Suite 410
Portland, OR 97201

**Re: Wacker Siltronic Property**

Dear Kurt:

This is in response to your letter of June 26, 2000, and will confirm our telephone conversations on July 24 and August 1.

At this time Northwest Natural must respectfully decline your invitation to enter into a joint consent order with Wacker Siltronic Corporation for a remedial investigation and potential source control measures at the Wacker property as proposed in your June 26th letter.

We submit that it is premature to commence these efforts given the prevailing uncertainties with respect to the respective roles of DEQ and EPA under the proposed NPL listing for the Portland Harbor. While we recognize that your proposed consent order contains contingency provisions that relate to some of the outstanding listing issues, we suggest that it would be more appropriate to enter into a suitable order once these issues have been resolved by formal agreement between DEQ and EPA. Otherwise, there remains a substantial risk that the parties will be required to undertake studies that could be devaluated by subsequent events.

We also suggest that the proposed studies should be assumed by all potentially responsible parties. Once the site has been formally listed, PRP status designations by EPA will help assure full participation.

Please be assured that Northwest Natural will be prepared to move forward on this matter at the appropriate time. We will welcome an opportunity to discuss any responsibility that Northwest Natural may have in connection with the Wacker property at such time as the





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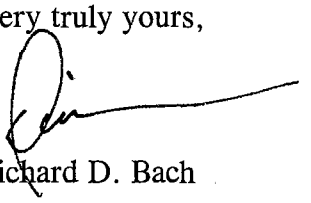
Statement of Principles attached to Governor Kitzhaber's July 7, 2000 letter to EPA Administrator Browner has been memorialized in the contemplated Memorandum of Agreement.

In the meantime, Northwest Natural will continue its remediation efforts at the Gasco site under its 1994 Voluntary Cleanup Agreement with DEQ. We trust that you and DEQ will recall that Northwest Natural also voluntarily stepped forward as an active participant in the Doane Lake Industrial Group studies and as a leading member of the Portland Harbor Group. Northwest Natural has never shirked its obligations in the past – and will not do so in the future. This, however, is simply not the right time for the proposed consent order.

Thank you for your patience and understanding.

Very truly yours,



Richard D. Bach

cc: Ms. Cathryn Young - Wacker Siltronic
Mr. Langdon Marsh - Oregon DEQ
Mr. Paul Slyman - Oregon DEQ



SCOEPA00010048

MAUL FOSTER ALONGI
ENVIRONMENTAL & ENGINEERING CONSULTANTS

PORTLAND, OREGON
SEATTLE, WASHINGTON
VANCOUVER, WASHINGTON

October 15, 2002
Project 8128.01.04

Mr. Eric Blischke
Coordinator, Portland Harbor
Oregon Department of Environmental Quality
2020 SW Fourth Avenue
Portland, Oregon 97201-4987

Re: October 15, 2002 Progress Report
Wacker Siltronic Corporation Site—7200 NW Front Avenue, Portland, Oregon 97210

Dear Eric:

At the request of Wacker Siltronic Corporation (Wacker), Maul Foster & Alongi, Inc. (MFA) has prepared this status update for the above-referenced site (see Figure 1). This letter has been prepared consistent with Section 6 (General Provisions), Item G (Progress Reports) of the Oregon Department of Environmental Quality (DEQ or Department) Order No. ECVC-NWR-00-27 (the Order).

## Work Completed During the Previous Month

During the reporting period, exploratory drilling and reconnaissance soil and groundwater sampling were initiated and completed in the northern corner of the site. The drilling and sampling were conducted to further evaluate the horizontal and vertical distribution of trichloroethene (TCE) previously detected at boring P-2[1] (see Figure 1). Fieldwork was performed between September 25 and October 8, and involved drilling four (4) exploratory borings designated GP-4, GP-5, GP-6, and GP-7 (see Figure 2) to approximately 100 feet below ground surface. Boring GP-4 was completed between September 26 and September 30. Drilling and sampling were performed at borings GP-5, GP-6, and GP-7 from September 30 through October 8. During drilling reconnaissance, soil and groundwater samples were collected for analysis of volatile organic compounds, including TCE, and polycyclic aromatic hydrocarbons. In addition, cyanide was included in the groundwater analyte list.

[1] Hahn and Associates, Inc. *Data Package for Focused Remedial Investigation, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* A report prepared for NW Natural. November 20, 2001.

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Except for collecting shallow groundwater samples from the base of fill material (i.e., on top of fine-grained sediments), exploratory drilling and reconnaissance soil and groundwater sampling were conducted consistent with the *Wacker Siltronic Corporation, Final Work Plan for Supplemental Remedial Investigation to Further Assess Trichloroethene Detections in the Northern Corner of Wacker Siltronic Corporation Site—7200 NW Front Avenue, Portland, Oregon 97210*, dated September 20, 2002 (the Work Plan). Samples were not collected from above fine-grained sediments because groundwater was absent from the depth interval projected for sample collection.

In addition to the work conducted in the field, preparation of the site background review report and the site data summary report was initiated.

## Anticipated Upcoming Activities

During the next month preparation of the site background review and site data summary reports will continue. Per the Work Plan and August 1, 2002, meeting discussions, these two reports are to be submitted to the Department in the middle of December. The site background review report will provide the DEQ with descriptions of Wacker's operations involving TCE, including information regarding Wacker's historical use and management of the chemical, and discussion(s) of releases to the environment that could have resulted in TCE contamination beneath the property. The site data summary report will provide the Department with an overview of the regulatory status of the site, interpretations regarding the subsurface geology, a preliminary conceptual site hydrogeologic model, and preliminary interpretations regarding the distribution of soil and groundwater impacts at the site.

MFA also anticipates that during the next month the laboratory will begin forwarding analytical reports for the soil and groundwater samples collected from the four borings. Upon receipt the analytical data and the laboratory quality assurance/quality control information will be reviewed by MFA using appropriate data review guidelines.[2]

[2] USEPA. *USEPA Contract Laboratory Program National Functional Guidelines for Organics Data Review*. U.S. Environmental Protection Agency, Office of Emergency and Remedial Response. EPA 540/94/012. February 1994.

Please feel free to contact us with questions regarding this letter.

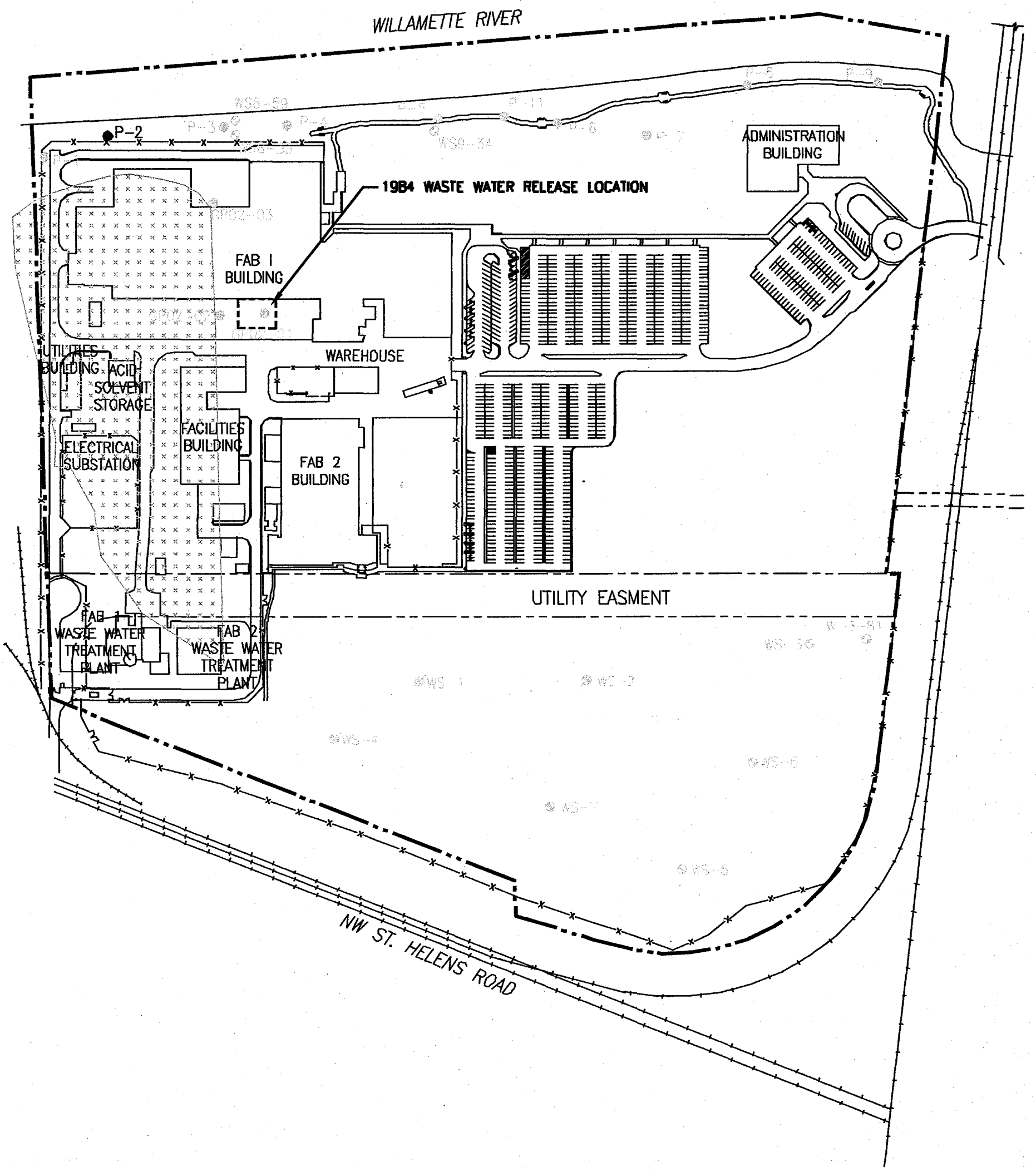
Sincerely,

Maul Foster & Alongi, Inc.

Dana S. Bayuk
Principal Hydrogeologist

Attachments: Figures 1 and 2

cc: Rod Struck, DEQ
✓Cathryn Young, Wacker
Tom McCue, Wacker
Myron Burr, Wacker
Bob Wyatt, NW Natural
Christopher Reive, Jordan Schrader

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MAUL FOSTER ALONGI


WACKER SILTRONIC CORPORATION
PORTLAND, OREGON

**SITE FEATURES**

DRAWING NO. 1

PROJECT NO. 8128.01.03

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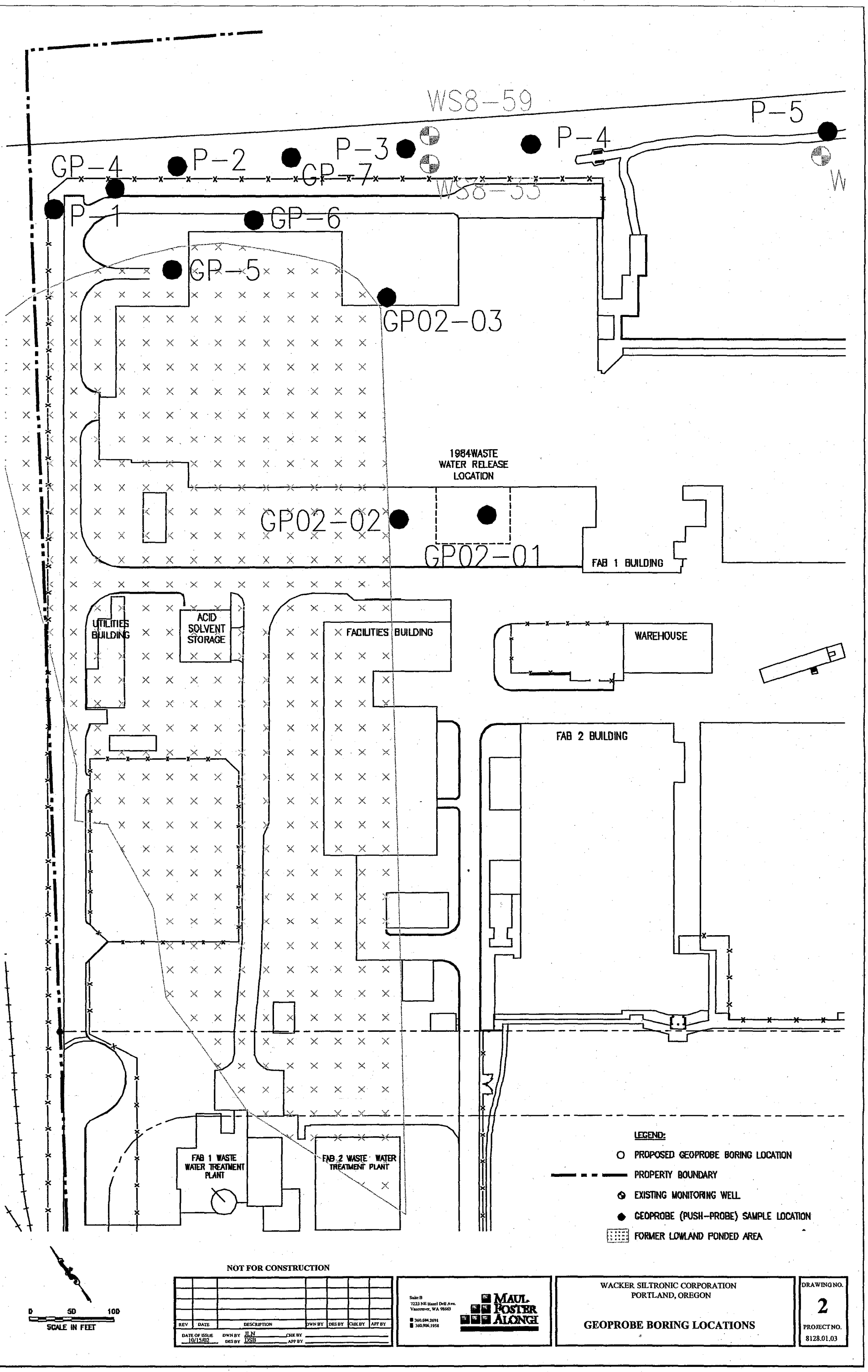


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DATE OF ISSUE 10/15/02 DWN BY JLN CHK BY
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MAUL FOSTER ALONGI

WACKER SILTRONIC CORPORATION
PORTLAND, OREGON

**GEOPROBE BORING LOCATIONS**

DRAWING NO. 2
PROJECT NO. 8128.01.03

**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL CONSULTANTS

November 15, 2002

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland OR 97201-4987

HAI Project No. 5237

SUBJECT: October 2002 Progress Report for Remedial Investigation (RI) Activities, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. Blischke:

Hahn and Associates, Inc. (HAI) has prepared this Progress Report summarizing RI work activities conducted by NW Natural that have occurred relating to the Wacker Siltronic Corporation (Wacker) property during the month of October 2002. RI field activities for the site are being conducted as per the approved *Final Focused Remedial Investigation (RI) Work Plan*[1] (RI Work Plan), as well as the approved *Supplemental RI Work Plan* [2]. This Progress Report has been prepared as per an Order (DEQ No. ECVC-NWR-00-27) issued jointly to both NW Natural and Wacker by the Oregon Department of Environmental Quality (DEQ), dated October 4, 2000. As per the referenced Order, monthly progress reports are to be prepared by the 15th day of each month, with the reporting to continue for the duration of the project.

**Summary of Activities in October 2002**

An EPA Level III validation of all quarterly groundwater data generated by NW Natural as part of Focused RI activities at the Wacker site entitled *Data Validation and Data Quality Assessment Report*, dated September 23, 2002, was submitted to the DEQ within correspondence dated October 16, 2002 (Ede to Blischke).

**Anticipated / Completed Activities in November and December 2002**

The only remaining Phase I RI data collection task to be completed at the site involves an inspection and survey of the base of the drainage ditch located on BNSF property immediately west and south of the Wacker property. Initiation of this task will require receipt of access approval from BNSF, the owner of the right-of-way through which the ditch runs. A proposed access agreement has been reviewed and approved by NW Natural. NW Natural is presently awaiting approval and execution of the access agreement by BNSF.

---

[1] Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1, 2001.

[2] Hahn and Associates, Inc. (2002). *Supplemental Remedial Investigation Work Plan, Wacker Siltronic Corporation,, 7200 NW Front Avenue, Portland, Oregon.* March 7, 2002.

A full reporting and evaluation of the results of NW Natural's investigatory activities will be included within the Phase I Site Characterization Summary Report and the Technical Memorandum on Source Control Measures, both of which are due to the ODEQ within 90 days after completion of the Phase I RI activities.

NW Natural understands that work plans and results of Wacker's own TCE-related investigation activities will be documented by Wacker and will be submitted independently by them to the DEQ.

Should you have any questions, please contact the undersigned.

Sincerely,

Robert Ede, R.G.
Associate

rede@hahnasoc.com

c: Mr. Bob Wyatt, NW Natural
Ms. Patty Dost, Schwabe, Williamson & Wyatt
Mr. Carl Stivers, Anchor Environmental, L.L.C.
Ms. Cathryn Young, Wacker Siltronic Corporation



SCOEPA00010055

**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL CONSULTANTS

October 15, 2002

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland OR 97201-4987

HAI Project No. 5237

SUBJECT: September 2002 Progress Report for Remedial Investigation (RI) Activities, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. Blischke:

Hahn and Associates, Inc. (HAI) has prepared this Progress Report summarizing RI work activities conducted by NW Natural that have occurred relating to the Wacker Siltronic Corporation (Wacker) property during the month of September 2002. RI field activities for the site are being conducted as per the approved *Final Focused Remedial Investigation (RI) Work Plan*[1] (RI Work Plan), as well as the approved *Supplemental RI Work Plan* [2]. This Progress Report has been prepared as per an Order (DEQ No. ECVC-NWR-00-27) issued jointly to both NW Natural and Wacker by the Oregon Department of Environmental Quality (DEQ), dated October 4, 2000. As per the referenced Order, monthly progress reports are to be prepared by the 15th day of each month, with the reporting to continue for the duration of the project.

**Summary of Activities in September 2002**

An EPA Level III validation of all quarterly groundwater data generated by NW Natural as part of Focused RI activities at the Wacker site was completed in September 2002. As such, all data collected to date by NW Natural as part of Focused RI activities have now been validated, and were found to be of sufficient quality to support pending source control evaluation activities. Results of the data validation activities associated with the quarterly groundwater monitoring data are included in the report prepared by Ms. Kathy Gunderson entitled *Data Validation and Data Quality Assessment Report*, dated September 23, 2002. Ms. Gunderson's data validation report will be submitted to the DEQ under separate cover.

**Anticipated / Completed Activities in October and November 2002**

Remaining Phase I RI data collection task to be completed at the site involves an inspection and survey of the base of the drainage ditch located on BNSF property immediately west and south of the Wacker property. Initiation of this task will require receipt of access

[1] Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1, 2001.

[2] Hahn and Associates, Inc. (2002). *Supplemental Remedial Investigation Work Plan, Wacker Siltronic Corporation,, 7200 NW Front Avenue, Portland, Oregon.* March 7, 2002.



SCOEPA00010056

approval from BNSF, the owner of the right-of-way through which the ditch runs. A proposed access agreement has been reviewed and approved by NW Natural. NW Natural is presently awaiting approval and execution of the access agreement by BNSF.

A full reporting and evaluation of the results of NW Natural's investigatory activities will be included within the Phase I Site Characterization Summary Report and the Technical Memorandum on Source Control Measures, both of which are due to the ODEQ within 90 days after completion of the Phase I RI activities.

NW Natural understands that work plans and results of Wacker's own TCE-related investigation activities will be documented by Wacker and will be submitted independently by them to the DEQ.

Should you have any questions, please contact the undersigned.

Sincerely,

Robert Ede, R.G.
Associate

rede@hahnasoc.com

c: Mr. Bob Wyatt, NW Natural
Ms. Patty Dost, Schwabe, Williamson & Wyatt
Mr. Carl Stivers, Anchor Environmental, L.L.C.
Ms. Cathryn Young, Wacker Siltronic Corporation



SCOEPA00010057

**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL CONSULTANTS

August 15, 2002

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland OR 97201-4987

HAI Project No. 5237

SUBJECT: July 2002 Progress Report for Remedial Investigation (RI) Activities, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. Blischke:

Hahn and Associates, Inc. (HAI) has prepared this Progress Report summarizing RI work activities conducted by NW Natural that have occurred relating to the Wacker Siltronic Corporation (Wacker) property (Figure 1) during the month of July 2002. RI field activities for the site are being conducted as per the approved *Final Focused Remedial Investigation (RI) Work Plan*[1] (RI Work Plan), as well as the approved *Supplemental RI Work Plan* [2]. This Progress Report has been prepared as per an Order (DEQ No. ECVC-NWR-00-27) issued jointly to both NW Natural and Wacker by the Oregon Department of Environmental Quality (ODEQ), dated October 4, 2000. As per the referenced Order, monthly progress reports are to be prepared by the 15th day of each month, with the reporting to continue for the duration of the project.

**Summary of Activities in July 2002**

The fourth, and final, quarterly groundwater monitoring event associated with the three monitoring wells installed in September 2001 at the Wacker property (WS-8-33, WS-8-59, and WS-9-34) was completed by HAI on July 10, 2002. These sampling activities were conducted synchronously with sampling activities conducted at the adjacent NW Natural-Gasco property.

Groundwater elevation data collected from the WS-8 and WS-9 series monitoring wells in July 2002, as well as during the previous three sampling events (October and December, 2001, and April 2002), are summarized on Table 1, while all available groundwater elevation data for the adjacent NW Natural – Gasco site are included on Table 2. Contoured groundwater elevation maps, depicting the Surficial Fill water-bearing zone (WBZ) and the intermediate depth interval of the Alluvial Sand WBZ during July 2002, are included as Figures 2 and 3. These groundwater elevation maps utilize available data from the Wacker (Table 1) the Gasco (Table 2) properties. Groundwater hydrographs for the WS-8 and WS-9 series wells are included as Figures 4 and 5.

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[1] Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1, 2001.

[2] Hahn and Associates, Inc. (2002). *Supplemental Remedial Investigation Work Plan, Wacker Siltronic Corporation,, 7200 NW Front Avenue, Portland, Oregon.* March 7, 2002.

A summary of the results of the April 2002 analyses of samples collected from the WS-8 and WS-9 series wells at Wacker, in addition to results from the previous sampling events (October and December 2001, and April 2002), is provided on Tables 3 through 6. As indicated on the referenced Tables, few compounds have been identified in groundwater at concentrations exceeding conservative screening levels (Ambient Water Quality Criteria). Although not relevant to groundwater, the AWQC was used as a very conservative screen with regard to the potential for groundwater discharge to impact surface water, assuming zero dilution in the receiving surface water body.

A continuous short-term groundwater elevation monitoring event was completed at the Wacker and adjacent Gasco site during July and August in accordance with an HAI-prepared *Groundwater Elevation Monitoring Plan*, dated May 30, 2002, as conditionally approved by the ODEQ in an e-mail dated July 8, 2002 (Struck to Wyatt and Ede). This short-term groundwater elevation monitoring event involved the collection of water elevation data on a fifteen minute frequency from select monitoring points over a two week period from July 24, 2002 through August 7, 2002.

**Anticipated / Completed Activities in August and September 2002**

It is anticipated that an EPA Level III validation of all soil, surface water, and groundwater data generated by NW Natural as part of Focused RI activities at the Wacker site will be complete prior to the end of September 2002. Upon completion, the data validation report(s) will be provided to the ODEQ.

The remaining Phase I RI data collection task to be completed at the site involves an inspection and survey of the base of the drainage ditch located on BNSF property immediately west and south of the Wacker property. Initiation of this task will require receipt of access approval from BNSF, the owner of the right-of-way through which the ditch runs. A proposed access agreement has been prepared by representatives of BNSF, and is currently under review by NW Natural. It is anticipated that issues related to the proposed access agreement may be identified and resolved such that the ditch survey may be completed during September 2002.

A full reporting and evaluation of the results of NW Natural's investigatory activities will be included within the Phase I Site Characterization Summary Report and the Technical Memorandum on Source Control Measures, both of which are due to the ODEQ within 90 days after completion of the Phase I RI activities.

NW Natural understands that work plans and results of Wacker's own TCE-related investigation activities will be documented by Wacker and will be submitted independently by them to the ODEQ.



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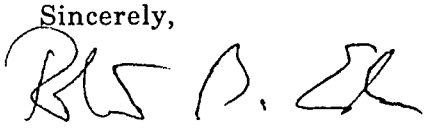
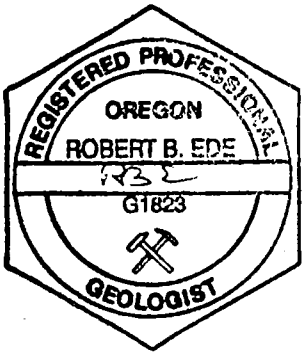
Should you have any questions, please contact the undersigned.

Sincerely,



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Associate

rede@hahnasoc.com

c: Mr. Bob Wyatt, NW Natural
Ms. Patty Dost, Schwabe, Williamson & Wyatt
Mr. Carl Stivers, Anchor Environmental, L.L.C.
Ms. Cathryn Young, Wacker Siltronic Corporation



SCOEPA00010060

**TABLE 1 - Summary of Water Level Measurements and Groundwater Elevations**
Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

HAI Project No. 5237

**Elevation of Top of Casing**

| Date of Elevation Survey | Elevation of Top of Casing (feet msl)* | | | | | | River Benchmark (feet msl)** |
|---|---|---|---|---|---|---|---|
| | WS-1-27[1] | WS-2-27[1] | WS-5-24[1] | WS-8-33 | WS-8-59 | WS-9-34 | |
| 23-Oct-01 | 35.18 | 33.67 | 37.83 | 34.28 | 34.16 | 33.51 | 32.12 |

**Measured Water Level**

| Date Measured | Measured Water Level (feet btc) | | | | | | River Level (feet bbm) |
|---|---|---|---|---|---|---|---|
| | WS-1-27 | WS-2-27 | WS-5-24 | WS-8-33 | WS-8-59 | WS-9-34 | |
| 8-Oct-01 | - | - | - | 28.90 | 29.58 | 27.15 | 28.15 |
| 12-Dec-01 | - | - | - | 25.02 | 25.30 | 22.77 | 24.44 |
| 2-Apr-02 | 3.57 | 6.02 | 7.60 | 25.95 | 26.21 | 23.40 | 23.60 |
| 10-Jul-02 | 11.43 | 12.12 | 19.93 | 24.01 | 25.71 | 22.25 | 23.16 |

**Groundwater Elevation**

| Date Measured | Groundwater Elevation (feet msl)* | | | | | | River Stage (feet msl)** |
|---|---|---|---|---|---|---|---|
| | WS-1-27 | WS-2-27 | WS-5-24 | WS-8-33 | WS-8-59 | WS-9-34 | |
| 8-Oct-01 | - | - | - | 5.38 | 4.58 | 6.36 | 3.97 |
| 12-Dec-01 | - | - | - | 9.26 | 8.86 | 10.74 | 7.68 |
| 2-Apr-02 | 31.61 | 27.65 | 30.23 | 8.33 | 7.95 | 10.11 | 8.52 |
| 10-Jul-02 | 23.75 | 21.55 | 17.90 | 10.27 | 8.45 | 11.26 | 8.96 |

NOTE: * = City of Portland Datum

**River Stage data measured directly from surveyed bench mark located on north end of dock at adjacent NW Natural property.

bbm = below bench mark

btc = below top of casing

msl = mean sea level

1= elevation survey not conducted by NW Natural - survey date is unknown. All measurements made by Wacker representatives at these well locations.



SCOEPA00010061

**TABLE 2 - Summary of Water Level Measurements and Groundwater Elevations**
Remedial Investigation
NW Natural - Gasco Facility
Portland, Oregon

Project No. 2708

**Elevation of Top of Casing**

| Date of Elevation Survey | Elevation of Top of Casing (feet msl)* | | | | | | | | | | | | | | | | | | | | | | | | River Benchmark (feet msl)** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MW-1-22 | MW-2-32 | MW-2-61 | MW-3-26 | MW-3-56 | MW-4-35 | MW-4-57 | MW-4-101 | MW-5-32 | MW-5-100 | MW-5-175 | MW-6-32 | MW-6-61 | MW-8-29 | MW-8-56 | MW-9-29 | MW-10-25 | MW-10-61 | MW-11-32 | MW-12-36 | MW-13-30 | MW-13-61 | MW-14-110 | MW-15-50 | MW-15-66 | |
| 7-Dec-95 | 34.75 | 34.46 | 34.41 | 34.11 | 34.07 | 34.54 | 34.53 | 34.36 | 27.83 | 27.31 | 27.19 | 35.51 | 34.50 | 39.09 | 39.13 | 37.65 | 39.22 | 39.33 | 38.39 | 38.69 | 34.86 | 34.78 | 37.41 | 35.97[1] | 36.06[1] | 32.12 |

**Measured Water Level**

| Date Measured | Measured Water Level (feet btc) | | | | | | | | | | | | | | | | | | | | | | | | River Level (feet bbm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MW-1-22 | MW-2-32 | MW-2-61 | MW-3-26 | MW-3-56 | MW-4-35 | MW-4-57 | MW-4-101 | MW-5-32 | MW-5-100 | MW-5-175 | MW-6-32 | MW-6-61 | MW-8-29 | MW-8-56 | MW-9-29 | MW-10-25 | MW-10-61 | MW-11-32 | MW-12-36 | MW-13-30 | MW-13-61 | MW-14-110 | MW-15-50 | MW-15-66 | |
| 5-Dec-95 | 14.15 | 15.23 | - | 15.58 | 15.79 | 16.12 | 16.39 | - | 9.46 | - | - | 16.71 | 15.77 | 19.75 | 20.61 | 6.20 | 14.98 | 13.42 | 12.69 | 9.37 | - | - | - | - | - | - |
| 5-Jan-96 | 14.47 | 20.04 | - | 19.47 | 21.85 | 22.47 | 22.38 | - | 15.57 | - | - | 14.84 | 21.58 | 19.01 | 26.74 | 7.33 | 15.20 | 16.32 | 12.19 | 10.82 | - | - | - | - | - | - |
| 12-Feb-96 | 7.74 | 8.61 | - | 8.52 | 8.63 | 9.09 | 9.10 | - | 2.41 | - | - | 9.55 | 8.97 | 16.99 | 13.56 | 3.32 | 11.11 | 8.92 | 8.95 | 5.27 | - | - | - | - | - | - |
| 18-Mar-96 | 12.44 | 18.03 | - | 17.87 | 19.66 | 20.24 | 20.21 | - | 13.37 | - | - | 12.10 | 19.39 | 15.22 | 24.54 | 6.13 | 11.95 | 14.47 | 9.42 | 9.01 | - | - | - | - | - | - |
| 16-Apr-96 | 13.65 | 18.83 | - | 18.13 | 19.47 | 20.26 | 20.07 | - | 13.36 | - | - | 13.42 | 19.51 | 15.58 | 24.44 | 6.93 | 12.63 | 15.07 | 10.12 | 9.69 | - | - | - | - | - | - |
| 10-May-96 | 13.75 | 19.47 | - | 18.98 | 22.01 | 22.58 | 22.60 | - | 15.78 | - | - | 13.30 | 21.55 | 15.77 | 26.93 | 6.94 | 12.98 | 15.90 | 10.40 | 10.24 | - | - | - | - | - | - |
| 17-Jun-96 | 13.88 | 17.40 | - | 17.40 | 18.21 | 18.61 | 18.73 | - | 11.96 | - | - | 13.40 | 18.13 | 16.00 | 23.15 | 5.03 | 13.51 | 13.96 | 10.90 | 9.98 | - | - | - | - | - | - |
| 16-Jul-96 | 15.51 | 20.71 | - | 20.07 | 24.41 | 24.30 | 24.93 | - | 17.91 | - | - | 14.60 | 23.55 | 17.26 | 29.05 | 6.65 | 15.90 | 17.21 | 11.93 | 12.43 | - | - | - | - | - | - |
| 21-Aug-96 | 16.51 | 21.80 | - | 22.24 | 26.99 | 26.77 | 27.51 | - | 20.46 | - | - | 16.17 | 26.27 | 19.18 | 31.93 | 8.47 | 16.58 | 19.43 | 13.40 | 14.53 | - | - | - | - | - | - |
| 17-Sep-96 | 17.06 | 22.06 | - | 20.61 | 28.02 | 27.15 | 28.53 | - | 21.27 | - | - | 16.94 | 26.81 | 20.13 | 32.63 | 7.52 | 16.80 | 19.30 | 14.02 | 14.86 | - | - | - | - | - | - |
| 30-Sep-96 | 17.17 | 22.24 | - | 23.32 | 27.04 | 27.46 | 27.61 | - | 20.68 | - | - | 17.08 | 27.01 | 20.19 | 32.45 | 8.70 | 16.89 | 19.84 | 14.26 | 14.97 | - | - | - | - | - | - |
| 15-Nov-96 | 16.38 | 22.02 | - | 20.76 | 26.48 | 26.85 | 27.00 | - | 19.84 | - | - | 17.00 | 25.71 | 20.63 | 31.37 | 6.61 | 16.42 | 18.38 | 14.20 | 13.85 | - | - | - | - | - | - |
| 24-Feb-97 | 12.41 | 18.71 | - | 18.61 | 20.48 | 20.82 | 21.02 | - | 14.17 | - | - | 12.83 | 19.79 | 18.43 | 25.33 | 4.35 | 14.85 | 14.33 | 11.18 | 9.71 | - | - | - | - | - | - |
| 10-Jun-97 | 12.89 | 14.23 | - | 13.80 | 14.20 | 14.70 | 14.56 | - | 7.97 | - | - | 13.81 | 14.61 | 18.56 | 19.25 | 4.84 | 16.01 | 12.20 | 12.50 | 8.49 | - | - | - | - | - | - |
| 26-Aug-97 | 15.38 | 21.70 | - | 22.61 | 26.10 | 26.56 | 25.84 | - | 19.63 | - | - | 18.53 | 25.58 | 20.31 | 31.13 | 11.71 | 17.10 | 20.16 | 14.30 | 14.13 | - | - | - | - | - | - |
| 25-Nov-97 | 14.42 | 21.50 | - | 19.25 | 24.64 | 25.14 | 24.80 | - | 18.23 | - | - | 16.29 | 24.33 | 20.85 | 29.85 | 7.85 | 16.36 | 17.89 | 13.88 | 11.79 | - | - | - | - | - | - |
| 19-Dec-97 | - | - | - | - | 22.75 | - | 23.28 | - | - | - | - | - | 22.62 | - | 27.90 | - | - | 16.90 | - | - | - | 23.71 | - | - | - | - |
| 16-Feb-98 | 12.60 | 20.13 | - | 18.65 | 23.55 | 23.25 | 24.10 | - | 17.09 | - | - | 14.29 | - | 20.05 | 28.50 | 5.33 | 15.60 | 15.89 | 12.02 | 9.72 | 14.73 | 23.98 | - | - | - | 21.91 |
| 1-Jun-98 | 14.49 | 16.97 | - | 16.61 | 16.51 | 16.90 | 17.00 | - | 10.33 | - | - | 15.75 | - | 20.05 | 21.63 | 7.25 | 14.63 | 14.36 | 12.85 | 9.83 | 15.69 | 17.11 | - | - | - | 14.57 |
| 25-Aug-98 | 17.62 | 22.74 | - | 23.68 | 27.79 | 27.32 | 28.36 | - | 21.14 | - | - | 17.73 | - | 20.89 | 32.46 | 12.67 | 14.32 | 21.19 | 14.29 | 14.97 | 17.56 | 28.22 | - | - | - | 25.72 |
| 16-Nov-98 | 18.42 | 24.59 | 28.36 | 22.20 | 27.57 | 27.32 | 28.10 | 28.29 | 20.99 | 21.19 | 21.05 | 18.23 | - | 21.19 | 32.13 | 12.10 | 14.30 | 20.81 | 14.45 | 14.92 | 17.78 | 28.11 | 24.84 | - | - | 26.32 |
| 15-Feb-99 | 11.97 | 19.02 | 23.94 | 18.27 | 23.20 | 23.94 | 23.71 | 23.75 | 16.75 | 16.72 | 16.54 | 12.35 | - | 17.66 | 27.97 | 5.11 | 12.41 | 15.34 | 10.03 | 9.51 | 13.04 | 23.62 | 20.35 | - | - | 21.94 |
| 11-May-99 | 14.32 | 20.19 | 22.99 | 18.76 | 22.44 | 22.92 | 22.99 | 22.94 | 16.06 | 15.87 | 15.68 | 13.41 | - | 16.56 | 27.31 | 8.50 | 15.82 | 16.94 | 10.82 | 11.11 | 14.03 | 22.91 | 20.62 | - | - | 21.21 |
| 20-Aug-99 | 17.37 | 22.16 | 26.95 | 21.92 | 26.31 | 25.98 | 26.81 | 26.87 | 19.73 | 19.80 | 19.62 | 19.80 | - | 19.65 | 31.04 | 12.04 | 15.00 | 20.46 | 14.25 | 14.40 | 17.18 | 26.81 | 23.93 | 15.05 | 15.37 | 25.80 |
| 25-Oct-99 | 18.48 | 24.73 | 28.77 | 24.40 | 28.05 | 28.02 | 28.49 | 28.44 | 21.58 | 21.36 | 21.11 | 19.00 | - | 20.83 | 32.78 | 13.86 | 16.40 | 22.15 | 15.60 | 16.51 | 18.52 | 28.63 | 25.68 | 16.92 | 17.28 | 26.49 |
| 27-Mar-00 | 12.88 | 20.09 | 26.94 | 19.24 | 26.27 | 25.69 | 26.80 | 26.91 | 19.36 | 19.83 | 19.64 | 14.05 | - | 19.43 | 31.08 | 6.25 | 17.70 | 17.32 | 12.90 | 11.65 | 14.45 | 26.71 | 23.11 | 14.05 | 14.68 | 25.30 |
| 15-Jun-00 | 16.26 | 21.18 | 24.08 | 20.01 | 23.56 | 24.42 | 24.14 | 24.10 | 17.40 | 17.07 | 16.86 | 16.05 | - | 19.53 | 28.42 | 10.15 | 14.74 | 18.55 | 13.36 | 13.11 | 15.82 | 24.10 | 22.02 | 14.14 | 14.96 | 21.70 |
| 4-Oct-00 | 18.15 | 23.24 | 28.92 | 22.12 | 28.42 | 28.02 | 28.95 | 28.92 | 21.93 | 21.88 | 21.69 | - | - | 20.31 | 33.46 | 13.67 | 14.09 | 22.31 | 14.15 | 16.85 | 17.32 | 28.98 | 26.31 | 17.81 | 18.66 | 26.00 |
| 20-Dec-00 | 17.98 | 22.73 | 27.13 | 19.50 | 26.89 | 26.13 | 27.27 | 26.76 | 20.33 | 19.63 | 19.31 | - | - | 19.24 | 32.12 | 12.22 | 13.02 | 20.20 | 13.09 | 15.17 | 16.70 | 27.70 | 26.05 | 16.25 | 17.08 | 25.00 |
| 27-Mar-01 | 16.91 | 21.94 | 28.05 | 20.86 | 27.35 | 27.01 | 27.91 | 28.10 | 20.66 | 21.05 | 20.88 | - | - | 19.19 | 32.07 | 11.91 | 13.74 | 20.85 | 13.63 | 14.96 | 16.81 | 27.86 | 25.24 | 16.40 | 17.23 | 25.70 |
| 28-Jun-01 | 18.02 | 23.49 | 28.58 | 24.14 | 28.11 | 27.51 | 28.52 | 28.25 | 21.59 | 21.23 | 20.97 | - | - | 21.14 | 33.04 | 13.31 | 17.27 | 22.92 | 15.25 | 16.06 | 18.06 | 28.72 | 25.88 | 17.32 | 18.11 | 27.01 |
| 8-Oct-01 | 19.24 | 26.16 | 29.85 | 25.45 | 29.10 | 29.05 | 29.68 | 28.72 | 22.67 | 22.60 | 22.45 | - | - | 21.99 | 34.11 | 15.50 | 18.28 | 23.89 | 17.10 | 18.45 | 19.41 | 29.78 | 27.51 | 19.41 | 20.19 | 28.15 |
| 12-Dec-01 | 16.73 | 22.68 | 26.54 | 20.49 | 25.81 | 24.12 | 26.33 | 26.46 | 19.01 | 19.41 | 19.21 | - | - | 21.58 | 30.43 | 9.71 | 16.50 | 19.00 | 16.00 | 13.67 | 17.89 | 26.34 | 23.66 | 15.05 | 15.86 | 24.44 |
| 2-Apr-02 | 14.98 | 20.47 | 25.78 | 20.61 | 25.33 | 26.38 | 25.84 | 25.59 | 18.71 | 18.56 | 18.34 | - | - | 20.24 | 30.61 | 7.99 | 16.77 | 18.46 | 13.16 | 12.48 | 15.35 | 25.85 | 23.59 | 14.56 | 15.42 | 23.60 |
| 10-Jul-02 | 17.18 | 21.78 | 25.31 | 21.42 | 24.69 | 25.12 | 25.22 | 25.13 | 18.28 | 18.10 | 17.92 | - | - | 20.43 | 29.73 | 11.61 | 16.20 | 19.92 | 14.00 | 13.98 | 17.09 | 25.31 | 23.29 | 15.91 | 15.22 | 23.16 |

NOTE: * = City of Portland Datum btc = below top of casing
bbm = below bench mark msl = mean sea level

**Willamette River, Portland Harbor Stage, obtained from National Weather Service and adjusted to feet msl - City of Portland datum: December 1995 to December 1997. Post December 1997 River Stage data measured directly from surveyed bench mark located on north end of FAMM Dock.

1=Well casing raised in January 2000. Pre-2000 top of casing elevations are: MW-15-50 (35.15 feet); MW-15-66 (35.36 feet)



SCOEPA00010062

**TABLE 2 - Summary of Water Level Measurements and Groundwater Elevations**
Remedial Investigation
NW Natural - Gasco Facility
Portland, Oregon

Project No. 2708

**Groundwater Elevation**

| Date Measured | Groundwater Elevation (feet msl)* | | | | | | | | | | | | | | | | | | | | | | | | | River Stage (feet msl)** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MW-1-22 | MW-2-32 | MW-2-61 | MW-3-26 | MW-3-56 | MW-4-35 | MW-4-57 | MW-4-101 | MW-5-32 | MW-5-100 | MW-5-175 | MW-6-32 | MW-6-61 | MW-8-29 | MW-8-56 | MW-9-29 | MW-10-25 | MW-10-61 | MW-11-32 | MW-12-36 | MW-13-30 | MW-13-61 | MW-14-110 | MW-15-50 | MW-15-66 | |
| 5-Dec-95 | 20.60 | 19.23 | - | 18.53 | 18.28 | 18.42 | 18.14 | - | 18.37 | - | - | 18.80 | 18.73 | 19.34 | 18.52 | 31.45 | 24.24 | 25.91 | 25.70 | 29.32 | - | - | - | - | - | 18.9 |
| 5-Jan-96 | 20.28 | 14.42 | - | 14.64 | 12.22 | 12.07 | 12.15 | - | 12.26 | - | - | 20.67 | 12.92 | 20.08 | 12.39 | 30.32 | 24.02 | 23.01 | 26.20 | 27.87 | - | - | - | - | - | 12.4 |
| 12-Feb-96 | 27.01 | 25.85 | - | 25.59 | 25.44 | 25.45 | 25.43 | - | 25.42 | - | - | 25.96 | 25.53 | 22.10 | 25.57 | 34.33 | 28.11 | 30.41 | 29.44 | 33.42 | - | - | - | - | - | 26.4 |
| 18-Mar-96 | 22.31 | 16.43 | - | 16.24 | 14.41 | 14.30 | 14.32 | - | 14.46 | - | - | 23.41 | 15.11 | 23.87 | 14.59 | 31.52 | 27.27 | 24.86 | 28.97 | 29.68 | - | - | - | - | - | 14.4 |
| 16-Apr-96 | 21.10 | 15.63 | - | 15.98 | 14.60 | 14.28 | 14.46 | - | 14.47 | - | - | 22.09 | 14.99 | 23.51 | 14.69 | 30.72 | 26.59 | 24.26 | 28.27 | 29.00 | - | - | - | - | - | 14.5 |
| 10-May-96 | 21.00 | 14.99 | - | 15.13 | 12.06 | 11.96 | 11.93 | - | 12.05 | - | - | 22.21 | 12.95 | 23.32 | 12.20 | 30.71 | 26.24 | 23.43 | 27.99 | 28.45 | - | - | - | - | - | 11.6 |
| 17-Jun-96 | 20.87 | 17.06 | - | 16.71 | 15.86 | 15.93 | 15.80 | - | 15.87 | - | - | 22.11 | 16.37 | 23.09 | 15.98 | 32.62 | 25.71 | 25.37 | 27.49 | 28.71 | - | - | - | - | - | 15.7 |
| 16-Jul-96 | 19.24 | 13.75 | - | 14.04 | 9.66 | 10.24 | 9.60 | - | 9.92 | - | - | 20.91 | 10.95 | 21.83 | 10.08 | 31.00 | 23.32 | 22.12 | 26.46 | 26.26 | - | - | - | - | - | - |
| 21-Aug-96 | 18.24 | 12.66 | - | 11.87 | 7.08 | 7.77 | 7.02 | - | 7.37 | - | - | 19.34 | 8.23 | 19.91 | 7.20 | 29.18 | 22.64 | 19.90 | 24.99 | 24.16 | - | - | - | - | - | 6.6 |
| 17-Sep-96 | 17.69 | 12.40 | - | 13.50 | 6.05 | 7.39 | 6.00 | - | 6.56 | - | - | 18.57 | 7.69 | 18.96 | 6.50 | 30.13 | 22.42 | 20.03 | 24.37 | 23.83 | - | - | - | - | - | 5.8 |
| 30-Sep-96 | 17.58 | 12.22 | - | 10.79 | 7.03 | 7.08 | 6.92 | - | 7.15 | - | - | 18.43 | 7.49 | 18.90 | 6.68 | 28.95 | 22.33 | 19.49 | 24.13 | 23.72 | - | - | - | - | - | 5.4 |
| 15-Nov-96 | 18.37 | 12.44 | - | 13.35 | 7.59 | 7.69 | 7.53 | - | 7.99 | - | - | 18.51 | 8.79 | 18.46 | 7.76 | 31.04 | 22.80 | 20.95 | 24.19 | 24.84 | - | - | - | - | - | 7.2 |
| 24-Feb-97 | 22.34 | 15.75 | - | 15.50 | 13.59 | 13.72 | 13.51 | - | 13.66 | - | - | 22.68 | 14.71 | 20.66 | 13.80 | 33.30 | 24.37 | 25.00 | 27.21 | 28.98 | - | - | - | - | - | 13.6 |
| 10-Jun-97 | 21.86 | 20.23 | - | 20.31 | 19.87 | 19.84 | 19.97 | - | 19.86 | - | - | 21.70 | 19.89 | 20.53 | 19.88 | 32.81 | 23.21 | 27.13 | 25.89 | 30.20 | - | - | - | - | - | 19.8 |
| 26-Aug-97 | 19.37 | 12.76 | - | 11.50 | 7.97 | 7.98 | 8.69 | - | 8.20 | - | - | 16.98 | 8.92 | 18.78 | 8.00 | 25.94 | 22.12 | 19.17 | 24.09 | 24.56 | - | - | - | - | - | 7.9 |
| 25-Nov-97 | 20.33 | 12.96 | - | 14.86 | 9.43 | 9.40 | 9.73 | - | 9.60 | - | - | 19.22 | 10.17 | 18.24 | 9.28 | 29.80 | 22.86 | 21.44 | 24.51 | 26.90 | - | - | - | - | - | 8.72 |
| 19-Dec-97 | - | - | - | - | 11.32 | - | 11.25 | - | - | - | - | - | 11.88 | - | 11.23 | - | - | 22.43 | - | - | - | 11.07 | - | - | - | - |
| 16-Feb-98 | 22.15 | 14.33 | - | 15.46 | 10.52 | 11.29 | 10.43 | - | 10.74 | - | - | 21.22 | - | 19.04 | 10.63 | 32.32 | 23.62 | 23.44 | 26.37 | 28.97 | 20.13 | 10.80 | - | - | - | 10.21 |
| 1-Jun-98 | 20.26 | 17.49 | - | 17.50 | 17.56 | 17.64 | 17.53 | - | 17.50 | - | - | 19.76 | - | 19.04 | 17.50 | 30.40 | 24.59 | 24.97 | 25.54 | 28.86 | 19.17 | 17.67 | - | - | - | 17.55 |
| 25-Aug-98 | 17.13 | 11.72 | - | 10.43 | 6.28 | 7.22 | 6.17 | - | 6.69 | - | - | 17.78 | - | 18.20 | 6.67 | 24.98 | 24.90 | 18.14 | 24.10 | 23.72 | 17.30 | 6.56 | - | - | - | 6.40 |
| 16-Nov-98 | 16.33 | 9.87 | 6.05 | 11.91 | 6.50 | 7.22 | 6.43 | 6.07 | 6.84 | 6.12 | 6.14 | 17.28 | - | 17.90 | 7.00 | 25.55 | 24.92 | 18.52 | 23.94 | 23.77 | 17.08 | 6.67 | 12.57 | - | - | 5.80 |
| 15-Feb-99 | 22.78 | 15.44 | 10.47 | 15.84 | 10.87 | 10.60 | 10.82 | 10.61 | 11.08 | 10.59 | 10.65 | 23.16 | - | 21.43 | 11.16 | 32.54 | 26.81 | 23.99 | 28.36 | 29.18 | 21.82 | 11.16 | 17.06 | - | - | 10.18 |
| 11-May-99 | 20.43 | 14.27 | 11.42 | 15.35 | 11.63 | 11.62 | 11.54 | 11.42 | 11.77 | 11.44 | 11.51 | 22.10 | - | 22.53 | 11.82 | 29.15 | 23.40 | 22.39 | 27.57 | 27.58 | 20.83 | 11.87 | 16.79 | - | - | 10.91 |
| 20-Aug-99 | 17.38 | 12.30 | 7.46 | 12.19 | 7.76 | 8.56 | 7.72 | 7.49 | 8.10 | 7.51 | 7.57 | 15.71 | - | 19.44 | 8.09 | 25.61 | 24.22 | 18.87 | 24.14 | 24.29 | 17.68 | 7.97 | 13.48 | 20.10 | 19.99 | 6.32 |
| 25-Oct-99 | 16.27 | 9.73 | 5.64 | 9.71 | 6.02 | 6.52 | 6.04 | 5.92 | 6.27 | 5.95 | 6.08 | 16.51 | - | 18.26 | 6.35 | 23.79 | 22.82 | 17.18 | 22.79 | 22.18 | 16.34 | 6.15 | 11.73 | 18.23 | 18.08 | 5.63 |
| 27-Mar-00 | 21.87 | 14.37 | 7.47 | 14.87 | 7.80 | 8.85 | 7.73 | 7.45 | 8.47 | 7.48 | 7.55 | 21.46 | - | 19.66 | 8.05 | 31.40 | 21.52 | 22.01 | 25.49 | 27.04 | 20.41 | 8.07 | 14.30 | 21.92 | 21.38 | 6.82 |
| 15-Jun-00 | 18.49 | 13.28 | 10.33 | 14.10 | 10.51 | 10.12 | 10.39 | 10.26 | 10.43 | 10.24 | 10.33 | 19.46 | - | 19.56 | 10.71 | 27.50 | 24.48 | 20.78 | 25.03 | 25.58 | 19.04 | 10.68 | 15.39 | 21.83 | 21.10 | 10.42 |
| 4-Oct-00 | 16.60 | 11.22 | 5.49 | 11.99 | 5.65 | 6.52 | 5.58 | 5.44 | 5.90 | 5.43 | 5.50 | - | - | 18.78 | 5.67 | 23.98 | 25.13 | 17.02 | 24.24 | 21.84 | 17.54 | 5.80 | 11.10 | 18.16 | 17.40 | 6.12 |
| 20-Dec-00 | 16.77 | 11.73 | 7.28 | 14.61 | 7.18 | 8.41 | 7.26 | 7.60 | 7.50 | 7.68 | 7.88 | - | - | 19.85 | 7.01 | 25.43 | 26.20 | 19.13 | 25.30 | 23.52 | 18.16 | 7.08 | 11.36 | 19.72 | 18.98 | 7.12 |
| 27-Mar-01 | 17.84 | 12.52 | 6.36 | 13.25 | 6.72 | 7.53 | 6.62 | 6.26 | 7.17 | 6.26 | 6.31 | - | - | 19.90 | 7.06 | 25.74 | 25.48 | 18.48 | 24.76 | 23.73 | 18.05 | 6.92 | 12.17 | 19.57 | 18.83 | 6.42 |
| 28-Jun-01 | 16.73 | 10.97 | 5.83 | 9.97 | 5.96 | 7.03 | 6.01 | 6.11 | 6.24 | 6.08 | 6.22 | - | - | 17.95 | 6.09 | 24.34 | 21.95 | 16.41 | 23.14 | 22.63 | 16.80 | 6.06 | 11.53 | 18.65 | 17.95 | 5.11 |
| 8-Oct-01 | 15.51 | 8.30 | 4.56 | 8.66 | 4.97 | 5.49 | 4.85 | 5.64 | 5.16 | 4.71 | 4.74 | - | - | 17.10 | 5.02 | 22.15 | 20.94 | 15.44 | 21.29 | 20.24 | 15.45 | 5.00 | 9.90 | 16.56 | 15.87 | 3.97 |
| 12-Dec-01 | 18.02 | 11.78 | 7.87 | 13.62 | 8.26 | 10.42 | 8.20 | 7.90 | 8.82 | 7.90 | 7.98 | - | - | 17.51 | 8.70 | 27.94 | 22.72 | 20.33 | 22.39 | 25.02 | 16.97 | 8.44 | 13.75 | 20.92 | 20.20 | 7.68 |
| 2-Apr-02 | 19.77 | 13.99 | 8.63 | 13.50 | 8.74 | 8.16 | 8.69 | 8.77 | 9.12 | 8.75 | 8.85 | - | - | 18.85 | 8.52 | 29.66 | 22.45 | 20.87 | 25.23 | 26.21 | 19.51 | 8.93 | 13.82 | 21.41 | 20.64 | 8.52 |
| 10-Jul-02 | 17.57 | 12.68 | 9.10 | 12.69 | 9.38 | 9.42 | 9.31 | 9.23 | 9.55 | 9.21 | 9.27 | - | - | 18.66 | 9.40 | 26.04 | 23.02 | 19.41 | 24.39 | 24.71 | 17.77 | 9.47 | 14.12 | 20.06 | 20.84 | 8.96 |

NOTE: * = City of Portland Datum
msl = mean sea level

**Willamette River, Portland Harbor Stage, obtained from National Weather Service and adjusted to feet msl - City of Portland datum: December 1995 to December 1997. Post December 1997 River Stage data measured directly from surveyed bench mark located on north end of FAMM Dock.

1=Well casing raised in January 2000. Pre-2000 top of casing elevations are: MW-15-50 (35.15 feet); MW-15-66 (35.36 feet)



SCOEPA00010063

**TABLE 3**
**Summary of Analytical Results for Groundwater Samples: Monitoring Wells**
**Detected Volatile Organic Compounds by EPA Method 8260**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Well Number | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Analytical Results – ug/l (ppb) VOCs by EPA Method 8260 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Aromatic VOCs (AVOCs) | | | | | Halogenated VOCs (HVOCs) | | | | | | |
| | | | | Benzene | Ethylbenzene | Toluene | Xylenes | Naphthalene | 1,1-DCE | cis-1,2-DCE | trans-1,2-DCE | TCE | Vinyl Chloride | Other VOCs | Total AVOCs / Total HVOCs |
| WS-8-33 | 5237-011009-107 | 9-Oct-01 | 23-33 | **107.** | 27.9 | ND> 10. | ND> 20. | **841.** | ND> 10. | ND> 10. | ND> 10. | ND> 10. | ND> 12. | 1,2,4-TMB = 18.8 | 994.7 / ND |
| | 5237-011213-105 | 13-Dec-01 | | 68. | 29.6 | ND> 5. | 23.2 | 455. | ND> 5. | ND> 5. | ND> 5. | ND> 5. | ND> 6. | 1,2,4-TMB = 23.1 | 598.9 / ND |
| | 5237-020403-105 | 3-Apr-02 | | **89.1** | 19.5 | 2.07 | 20.48 | 327. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | 1,2,4-TMB = 9.56; 1,3.5-TMB=2.49; IPB=2.38 | 472.6 / ND |
| | 5237-020403-106 (dup) | 3-Apr-02 | | **87.4** | 18. | 2.14 | 18.5 | 216. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | 1,2,4-TMB = 7.78; 1,3.5-TMB=2.16; IPB=2.12 | 354.1 / ND |
| | 5237-020710-104 | 10-Jul-02 | | 65.9 | 31.6 | 1.24 | 53.1 | 135. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | 1,2,4-TMB = 31.2; 1,3.5-TMB=8.28; IPB=4.46; 4-IPT=1.33; nPB=1.19 | 286.8 / ND |
| | 5237-020710-105 (dup) | 10-Jul-02 | | 68.1 | 30.4 | 1.29 | 49.8 | 145. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | 1,2,4-TMB = 30.8; 1,3.5-TMB=8.39; IPB=4.26; 4-IPT=1.47; nPB=1.27 | 294.6 / ND |
| WS-8-59 | 5237-011008-104 | 8-Oct-01 | 49-59 | 14.7 | ND> 1. | ND> 1. | ND> 2. | 38.9 | ND> 1. | 251. | ND> 1. | ND> 1. | 92.4 | ND | 53.6 / 343.4 |
| | 5237-011008-105 (dup) | 8-Oct-01 | | 21.4 | ND> 1. | 2.02 | ND> 2. | 49.9 | ND> 1. | 345. | ND> 1. | ND> 1. | 129. | ND | 73.3 / 474. |
| | 5237-011212-103 | 12-Dec-01 | | 26.8 | ND> 1. | 1.27 | 2.66 | 13.9 | ND> 1.5 | 409. | 2.2 | 3.53 | 332. | ND | 44.6 / 746.7 |
| | 5237-011212-104 (dup) | 12-Dec-01 | | 27. | ND> 1. | 1.32 | 2.57 | 12.4 | 1.03 | 398. | 2.15 | 3.39 | 306. | ND | 43.3 / 710.6 |
| | 5237-020403-104 | 3-Apr-02 | | 13. | ND> 1. | ND> 1. | 1.11 | ND> 2. | ND> 1. | 99.6 | ND> 1. | ND> 1. | 136. | ND | 14.1 / 235.6 |
| | 5237-0207103 | 10-Jul-02 | | 20.8 | ND> 1. | 1.17 | 2.29 | ND> 2. | ND> 1. | 117. | ND> 1. | 1.19 | 160. | ND | 24.3 / 278.2 |
| WS-9-34 | 5237-011008-102 | 8-Oct-01 | 24-34 | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 5. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND / ND |
| | 5237-011212-101 | 12-Dec-01 | | ND> 1. | ND> 1. | ND> 1. | ND> 2. | 2.04 | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | 2. / ND |
| | 5237-020402-101 | 2-Apr-02 | | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND / ND |
| | 5237-020710-101 | 10-Jul-02 | | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND / ND |
| Quality Control Samples | | | | | | | | | | | | | | | |
| Trip Blanks | 5237-011008-101 | 8-Oct-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 5. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND / ND |
| | 5237-011212-100 | 12-Dec-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND / ND |
| | 5237-011213-106 | 13-Dec-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND / ND |
| | 5237-011009-106 | 9-Oct-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND / ND |
| | 5237-020402-100 | 2-Apr-02 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND / ND |
| | 5237-020403-103 | 3-Apr-02 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND / ND |
| | 5237-020710-100 | 10-Jul-02 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND / ND |
| Water EB | 5237-011008-103 | 8-Oct-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 5. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | acetone = 149.0 | ND / ND |
| | 5237-011212-102 | 12-Dec-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | acetone = 54.7 | ND / ND |
| | 5237-020402-102 | 2-Apr-02 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND / ND |
| | 5237-020710-102 | 10-Jul-02 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND / ND |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | 71. [3] | 29,000. [3] | 200,000. [3] | # | 620. [3] | # | 11,600. [3] | 140,000. [3] | 81. [3] | 525. [3] | # | # / # |

Note:
# = not established
AVOCs = aromatic volatile organic compounds
bgs = below ground surface
DCB = dichlorobenzene
DCE = dichloroethene
EB = equipment blank
EPA = U.S. Environmental Protection Agency
HVOCs = halogenated volatile organic compounds
IPB = isopropylbenzene
ND = not detected above detection limit indicated
nPB = n-propylbenzene
ppb = parts per billion
TCE = trichloroethene
TMB = trimethylbenzene
ug/l = micrograms/liter
VOCs = volatile organic compounds

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Human Fish Consumption Criteria of AWQC
3 = Reference Level based on Lowest Observable Health Effect Level for Freshwater, as provided within NOAA Screening Quick Reference Tables, updated September 1999
**Bold** = Detected above lowest identified AWQC

**TABLE 4**
**Summary of Analytical Results for Groundwater Samples: Monitoring Wells**
**Polynuclear Aromatic Hydrocarbons by EPA Method 8270 SIM**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| PAHs by EPA Method 8270 (SIM) | | | | Analytical Results ug/l (ppb) | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Carcinogenic PAHs | | | | | | | Non-carcinogenic PAHs | | | | | | | | | | | |
| Well Number | HAI Sample Number[1] | Sample Date | Screen Interval (feet bgs) | Benzo (a) anthracene | Benzo (b) fluoranthene | Benzo (k) fluoranthene | Benzo (a) pyrene | Chrysene | Dibenzo (a,h) anthracene | Indeno (1,2,3-cd) pyrene | Acenaphthene | Acenaphthylene | Anthracene | Benzo (g,h,i) perylene | Fluoranthene | Fluorene | Naphthalene | Phenanthrene | Pyrene | Total PAHs |
| WS-8-33 | 5237-011009-107 | 9-Oct-01 | 23-33 | **0.55** | **0.19** | ND> 0.1 | **0.27** | **0.6** | ND> 0.1 | **0.11** | 98.7 | 1.17 | 8.42 | 0.15 | 7.83 | 32.5 | 485. | 85. | 7.65 | 728.1 |
| | 5237-011213-105 | 13-Dec-01 | | **0.25** | **0.1** | ND> 0.1 | **0.27** | **0.3** | ND> 0.1 | **0.11** | 105. | 2.35 | 11.9 | ND> 0.1 | 7.35 | 31.9 | 287. | 70.5 | 7.15 | 524.2 |
| | 5237-020403-105 | 3-Apr-02 | | **0.31** | ND> 0.1 | ND> 0.1 | ND> 0.1 | **0.42** | ND> 0.1 | ND> 0.1 | 91.6 | 1.01 | 6.43 | ND> 0.1 | 7.18 | 18.4 | 110. | 34.1 | 5.16 | 274.6 |
| | 5237-020403-106 (dup) | 3-Apr-02 | | **0.32** | ND> 0.1 | ND> 0.1 | ND> 0.1 | **0.44** | ND> 0.1 | ND> 0.1 | 84. | 1.39 | 7.14 | ND> 0.1 | 8.2 | 19.5 | 101. | 33.8 | 6.38 | 262.2 |
| | 5237-020710-104 | 10-Jul-02 | | **0.53** | **0.11** | **0.12** | **0.15** | **0.53** | ND> 0.1 | ND> 0.1 | 129. | 1.65 | 8.42 | 0.11 | 7.7 | 34.4 | 77.4 | 72. | 8.16 | 340.3 |
| | 5237-020710-105 (dup) | 10-Jul-02 | | **0.68** | **0.19** | **0.17** | **0.26** | **0.67** | ND> 0.1 | **0.13** | 132. | 1.48 | 8.63 | 0.2 | 8.15 | 36.2 | 77.6 | 80.4 | 7.37 | 354.1 |
| WS-8-59 | 5237-011008-104 | 8-Oct-01 | 49-59 | **0.25** | ND> 0.1 | ND> 0.1 | ND> 0.1 | **0.29** | ND> 0.1 | ND> 0.1 | 18.5 | 0.38 | 4.2 | ND> 0.1 | 5.8 | 7.9 | 22.7 | 31.8 | 6.4 | 98.2 |
| | 5237-011008-105 (dup) | 8-Oct-01 | | **0.2** | ND> 0.1 | ND> 0.1 | ND> 0.1 | **0.24** | ND> 0.1 | ND> 0.1 | 18.9 | 0.39 | 4.1 | ND> 0.1 | 5.5 | 7.9 | 22.5 | 29.8 | 6.3 | 95.8 |
| | 5237-011212-103 | 12-Dec-01 | | **0.32** | **0.1** | **0.1** | **0.14** | **0.41** | ND> 0.1 | ND> 0.1 | 12.9 | 0.24 | 2.97 | 0.1 | 4.72 | 4.77 | 10.5 | 22.8 | 5.07 | 65.1 |
| | 5237-011212-104 (dup) | 12-Dec-01 | | **0.23** | ND> 0.1 | ND> 0.1 | ND> 0.1 | **0.29** | ND> 0.1 | ND> 0.1 | 12.6 | 0.23 | 2.94 | ND> 0.1 | 4.46 | 5.13 | 10.8 | 21.8 | 4.49 | 63. |
| | 5237-020403-104 | 3-Apr-02 | | **0.16** | ND> 0.1 | ND> 0.1 | ND> 0.1 | **0.24** | ND> 0.1 | ND> 0.1 | 5.03 | ND> 0.1 | 1.91 | ND> 0.1 | 3.5 | 2.34 | 1.13 | 9.9 | 2.57 | 26.8 |
| | 5237-020710-103 | 10-Jul-02 | | **0.17** | ND> 0.1 | ND> 0.1 | ND> 0.1 | **0.23** | ND> 0.1 | ND> 0.1 | 4.53 | ND> 0.1 | 1.31 | ND> 0.1 | 3.15 | 1.92 | 0.63 | 3.45 | 3.49 | 18.9 |
| WS-9-34 | 5237-011008-102 | 8-Oct-01 | 24-34 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | 2.07 | 0.15 | ND> 0.1 | ND> 0.1 | 0.36 | 0.18 | 0.45 | ND> 0.1 | 0.38 | 3.6 |
| | 5237-011212-101 | 12-Dec-01 | | **0.11** | **0.1** | **0.1** | **0.15** | **0.17** | ND> 0.1 | **0.12** | 17.8 | 0.33 | 0.33 | 0.17 | 1.91 | 6.43 | 0.4 | 2.45 | 1.74 | 32.3 |
| | 5237-020402-101 | 2-Apr-02 | | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | 17.5 | 0.19 | 0.44 | ND> 0.1 | 1.59 | 1.8 | ND> 0.1 | 4.81 | ND> 0.1 | 26.3 |
| | 5237-020710-101 | 10-Jul-02 | | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | 11.1 | 0.17 | 0.22 | ND> 0.1 | 0.91 | 2.09 | 0.13 | 2.06 | 1.13 | 17.8 |
| Quality Control Samples | | | | | | | | | | | | | | | | | | | | |
| Trip Blanks | 5237-011008-101 | 8-Oct-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-011212-100 | 12-Dec-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-011213-106 | 13-Dec-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-011009-106 | 9-Oct-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-020402-100 | 2-Apr-02 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-020403-103 | 3-Apr-02 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-020710-100 | 10-Jul-02 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Water EB | 5237-011008-103 | 8-Oct-01 | NA | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND |
| | 5237-011212-102 | 12-Dec-01 | NA | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND |
| | 5237-020402-102 | 2-Apr-02 | NA | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND |
| | 5237-020710-102 | 10-Jul-02 | NA | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | 0.049 [3] | 0.049 [2] | 0.049 [3] | 0.049 [3] | 0.049 [2] | 0.049 [3] | 0.049 [3] | 2,700. [2] | # | 110,000. [3] | # | 370. [3] | 14,000. [3] | 620. [4] | # | 11,000. [3] | # | |

Note:
# = not established
bgs = below ground surface
EB = equipment blanks
EPA = U.S. Environmental Protection Agency
ND = not detected above detection limit indicated
PAHs = polynuclear aromatic hydrocarbons
ppb = parts per billion
ug/l = micrograms per liter

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC
4 = Reference Level based on Lowest Observable Health Effect Level for Freshwater, as provided within NOAA Screening Quick Reference Tables, updated September 1999
**Bold** = Detected above lowest identified AWQC

**TABLE 5**
**Summary of Analytical Results for Groundwater Samples: Monitoring Wells**
**Detected Semi-Volatile Organic Compounds by EPA Method 8270C**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| SVOCs by EPA Method 8270 | | | | Analytical Results ug/l (ppb) | | | |
|---|---|---|---|---|---|---|---|
| Well Number | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Carbazole | Dibenzofuran | 2-Methylnaphthalene | PAHs |
| WS-8-33 | 5237-011009-107 | 9-Oct-01 | 23-33 | 14.7 | 4.26 | 59.2 | See Table 4 |
| | 5237-011213-105 | 13-Dec-01 | | 45.2 | 3.97 | 65.8 | See Table 4 |
| | 5237-020403-105 | 3-Apr-02 | | 11.5 | 2.12 | 5.48 | See Table 4 |
| | 5237-020403-106 (dup) | 3-Apr-02 | | - | - | - | See Table 4 |
| | 5237-020710-104 | 10-Jul-02 | | 18.3 | 3.05 | 41.9 | See Table 4 |
| | 5237-020710-105 (dup) | 10-Jul-02 | | - | - | - | See Table 4 |
| WS-8-59 | 5237-011008-104 | 8-Oct-01 | 49-59 | ND> 4. | ND> 2. | 6.74 | See Table 4 |
| | 5237-011008-105 (dup) | 8-Oct-01 | | ND> 4. | ND> 2. | 7.17 | See Table 4 |
| | 5237-011212-103 | 12-Dec-01 | | ND> 4. | ND> 2. | ND> 2. | See Table 4 |
| | 5237-011212-104 (dup) | 12-Dec-01 | | ND> 4. | ND> 2. | ND> 2. | See Table 4 |
| | 5237-020403-104 | 3-Apr-02 | | ND> 8. | ND> 4. | ND> 4. | See Table 4 |
| | 5237-020710-103 | 10-Jul-02 | | ND> 4. | ND> 2. | ND> 2. | See Table 4 |
| WS-9-34 | 5237-011008-102 | 8-Oct-01 | 24-34 | ND> 4. | ND> 2. | ND> 2. | See Table 4 |
| | 5237-011212-101 | 12-Dec-01 | | ND> 4. | ND> 2. | ND> 2. | See Table 4 |
| | 5237-020402-101 | 2-Apr-02 | | ND> 8. | ND> 4. | ND> 4. | See Table 4 |
| | 5237-020710-101 | 10-Jul-02 | | ND> 4. | ND> 2. | ND> 2. | See Table 4 |
| Quality Control Samples | | | | | | | |
| Trip Blanks | 5237-011008-101 | 8-Oct-01 | NA | - | - | - | - |
| | 5237-011212-100 | 12-Dec-01 | NA | - | - | - | - |
| | 5237-011009-106 | 9-Oct-01 | NA | - | - | - | - |
| | 5237-011213-106 | 13-Dec-01 | NA | - | - | - | - |
| | 5237-020710-100 | 10-Jul-02 | NA | - | - | | - |
| Water EB | 5237-011008-103 | 8-Oct-01 | NA | ND> 4. | ND> 2. | ND> 2. | See Table 2 |
| | 5237-011212-102 | 12-Dec-01 | NA | ND> 4. | ND> 2. | ND> 2. | See Table 2 |
| | 5237-020402-102 | 2-Apr-02 | NA | - | - | - | See Table 2 |
| | 5237-020710-102 | 10-Jul-02 | NA | - | - | - | See Table 2 |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | # | # | # | # |

Note:
bgs = below ground surface
EB = equipment blanks
EPA = U.S. Environmental Protection Agency
ND = Not detected above detection limit indicated
PAHs = polynuclear aromatic hydrocarbons
ppb = parts per billion
ug/l = micrograms/liter
# = not established

1 = Ambient Water Quality Criteria (EPA 822-Z-99-001)



SCOEPA00010066

TABLE 6
**Summary of Analytical Results for Groundwater Samples: Monitoring Wells**
**Metals and Cyanide**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Well Number | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Analytical Results – mg/l (ppm) Total Metals by EPA Methods 6010, 200.7 and/or 7000 Series | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Antimony | Antimony, Diss | Arsenic | Arsenic, Diss | Barium | Barium, Diss | Cadmium | Cadmium, Diss | Chromium | Chromium, Diss | Cobalt | Cobalt, Diss | Copper | Copper, Diss | Iron | Iron, Diss | Lead | Lead, Diss |
| WS-8-33 | 5237-011009-107 | 9-Oct-01 | 23-33 | ND> 0.003 | - | **0.0063** | - | 0.184 | - | ND> 0.001 | - | 0.0069 | - | 0.0041 | - | **0.0264** | - | 117. | - | **0.0082** | - |
| | 5237-011213-105 | 13-Dec-01 | | ND> 0.005 | - | **0.0162** | - | 0.142 | - | ND> 0.002 | - | 0.005 | - | 0.005 | - | 0.005 | - | 76.6 | - | ND> 0.005 | - |
| | 5237-020403-105 | 3-Apr-02 | | ND> 0.005 | ND> 0.005 | **0.018** | **0.0148** | 0.115 | 0.104 | ND> 0.005 | ND> 0.002 | ND> 0.005 | ND> 0.005 | ND> 0.005 | ND> 0.005 | ND> 0.005 | ND> 0.015 | 90.9 | 81.5 | ND> 0.005 | ND> 0.01 |
| | 5237-020403-106 (dup) | 3-Apr-02 | | ND> 0.005 | - | **0.0174** | - | 0.114 | - | ND> 0.002 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | 89.6 | - | ND> 0.005 | - |
| | 5237-020710-104 | 10-Jul-02 | | ND> 0.005 | ND> 0.005 | **0.0152** | **0.0198** | 0.117 | 0.114 | ND> 0.002 | ND> 0.0222 | ND> 0.005 | ND> 0.0056 | ND> 0.005 | ND> 0.0056 | ND> 0.005 | ND> 0.0056 | 80.6 | 80.7 | ND> 0.005 | ND> 0.0056 |
| | 5237-020710-105 (dup) | 10-Jul-02 | | ND> 0.005 | - | **0.0173** | - | 0.116 | - | ND> 0.002 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | 0.0803 | - | ND> 0.005 | - |
| WS-8-59 | 5237-011008-104 | 8-Oct-01 | 49-59 | ND> 0.003 | - | ND> 0.005 | - | 0.153 | - | ND> 0.001 | - | ND> 0.005 | - | ND> 0.001 | - | 0.0055 | - | 49.6 | - | ND> 0.005 | - |
| | 5237-011008-105 (dup) | 8-Oct-01 | | ND> 0.003 | - | ND> 0.005 | - | 0.142 | - | ND> 0.001 | - | ND> 0.005 | - | ND> 0.001 | - | 0.0037 | - | 47. | - | ND> 0.005 | - |
| | 5237-011212-103 | 12-Dec-01 | | ND> 0.005 | - | ND> 0.005 | - | 0.123 | - | ND> 0.002 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | 48.1 | - | ND> 0.005 | - |
| | 5237-011212-104 (dup) | 12-Dec-01 | | ND> 0.005 | - | ND> 0.005 | - | 0.119 | - | ND> 0.002 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | 47.2 | - | ND> 0.005 | - |
| | 5237-020403-104 | 3-Apr-02 | | ND> 0.005 | - | ND> 0.005 | - | 0.0931 | - | ND> 0.002 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | 46.8 | - | ND> 0.005 | - |
| | 5237-020710-103 | 10-Jul-02 | | ND> 0.005 | - | ND> 0.005 | - | 0.1 | - | ND> 0.002 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | 45.7 | - | ND> 0.005 | - |
| WS-9-34 | 5237-011008-102 | 8-Oct-01 | 24-34 | ND> 0.003 | - | ND> 0.005 | - | 0.246 | - | ND> 0.001 | - | ND> 0.005 | - | 0.0281 | - | 0.0074 | - | 33.9 | - | ND> 0.005 | - |
| | 5237-011212-101 | 12-Dec-01 | | 0.0067 | 0.0108 | **0.0607** | ND> 0.005 | 0.923 | 0.0348 | ND> 0.002 | ND> 0.002 | **0.0207** | ND> 0.005 | 0.0437 | 0.0112 | **0.0431** | ND> 0.005 | 188. | 88. | **0.197** | ND> 0.005 |
| | 5237-020402-101 | 2-Apr-02 | | ND> 0.005 | 0.0086 | **0.038** | 0.007 | 0.607 | 0.0467 | ND> 0.002 | ND> 0.002 | **0.0187** | ND> 0.005 | 0.0273 | 0.0132 | **0.0391** | ND> 0.015 | 150. | 37.7 | **0.0948** | ND> 0.01 |
| | 5237-020710-101 | 10-Jul-02 | | ND> 0.005 | ND> 0.0056 | **0.0311** | ND> 0.0056 | 0.553 | 0.081 | ND> 0.002 | ND> 0.0022 | **0.0326** | ND> 0.0056 | 0.0404 | 0.0231 | **0.0359** | ND> 0.0056 | 146. | 64.3 | **0.131** | ND> 0.0056 |
| Quality Control Samples | | | | | | | | | | | | | | | | | | | | | |
| Trip Blanks | 5237-011008-101 | 8-Oct-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-011009-106 | 9-Oct-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-011212-100 | 12-Dec-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-011213-106 | 13-Dec-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-020402-100 | 2-Apr-02 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-020403-103 | 3-Apr-02 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-020710-100 | 10-Jul-02 | NA | | | | | | | | | | | | | | | | | | |
| Water EB | 5237-011212-102 | 12-Dec-01 | NA | ND> 0.003 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.002 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | 0.0222 | - | ND> 0.005 | - |
| | 5237-011008-103 | 8-Oct-01 | NA | ND> 0.003 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.001 | - | ND> 0.005 | - | ND> 0.001 | - | ND> 0.001 | - | 0.0417 | - | ND> 0.005 | - |
| | 5237-020402-102 | 2-Apr-02 | NA | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.002 | - | ND> 0.005 | - | ND> 0.005 | - | 0.0052 | - | 0.142 | - | ND> 0.005 | - |
| | 5237-020710-102 | 10-Jul-02 | NA | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.002 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.01 | - | ND> 0.005 | - |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | 4.3 [3] | | 0.00014 [3] | | # | | 0.002 [2] | | 0.011 [2] | | # | | 0.009 [3] | | # | | 0.0025 | |

Note:
# = not established
bgs = below ground surface
Diss = dissolved
EB = equipment blank
EPA = U.S. Environmental Protection Agency
mg/l = milligrams/liter
ND = not detected above detection limit indicated
ppm = parts per million

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC

Bold = Detected above lowest identified AWQC



SCOEPA00010067

**TABLE 6**
**Summary of Preliminary Analytical Results for Groundwater Samples: Monitoring Wells**
**Metals and Cyanide**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Well Number | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Analytical Results – mg/l (ppm) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Total Metals by EPA Methods 6010, 200.7 and/or 7000 Series | | | | | | | | | | | | | | | | EPA 9010 B | EPA 9010 B |
| | | | | Magnesium | Magnesium, Diss | Manganese | Manganese, Diss | Nickel | Nickel, Diss | Selenium | Selenium, Diss | Silver | Silver, Diss | Titanium | Titanium, Diss | Vanadium | Vanadium, Diss | Zinc | Zinc, Diss | Total Cyanide | Amenable Cyanide |
| WS-8-33 | 5237-011009-107 | 9-Oct-01 | 23-33 | 27.2 | - | 5.07 | - | 0.0039 | - | ND> 0.005 | - | ND> 0.0019 | - | 0.766 | - | 0.0397 | - | 0.0496 | - | ND> 0.02 | ND> 0.02 |
| | 5237-011213-105 | 13-Dec-01 | | 30. | - | 5.57 | - | ND> 0.005 | - | 0.0063 | - | ND> 0.005 | - | 0.0762 | - | 0.0059 | - | 0.0147 | - | **0.854** | ND> 0.02 |
| | 5237-020403-105 | 3-Apr-02 | | 21.8 | 19.9 | 4.88 | 4.51 | ND> 0.005 | ND> 0.005 | ND> 0.005 | 0.0084 | ND> 0.005 | ND> 0.005 | 0.022 | ND> 0.01 | ND> 0.005 | ND> 0.005 | 0.0243 | ND> 0.015 | **0.416** | 0.064 |
| | 5237-020403-106 (dup) | 3-Apr-02 | | 21.5 | - | 4.85 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | 0.013 | - | ND> 0.005 | - | ND> 0.005 | - | **0.615** | 0.183 |
| | 5237-020710-104 | 10-Jul-02 | | 24.1 | 24.3 | 4.89 | 5.02 | ND> 0.005 | ND>.00556 | ND> 0.005 | ND> 0.0056 | ND> 0.005 | ND> 0.0056 | 0.0286 | ND> 0.0111 | 0.0053 | ND> 0.0056 | 0.0053 | ND> 0.0056 | **0.724** | ND> 0.08 |
| | 5237-020710-105 (dup) | 10-Jul-02 | | 24.2 | - | 4.89 | 4.89 | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | 0.0171 | - | ND> 0.005 | - | ND> 0.005 | - | **0.726** | ND> 0.08 |
| WS-8-59 | 5237-011008-104 | 8-Oct-01 | 49-59 | ND> 0.05 | - | 2.85 | - | ND> 0.003 | - | ND> 0.005 | - | ND> 0.0019 | - | 0.564 | - | 0.0233 | - | 0.0307 | - | **0.468** | ND> 0.02 |
| | 5237-011008-105 (dup) | 8-Oct-01 | | ND> 0.05 | - | 2.84 | - | ND> 0.003 | - | ND> 0.005 | - | ND> 0.0019 | - | 0.448 | - | 0.0173 | - | 0.0236 | - | **0.456** | ND> 0.02 |
| | 5237-011212-103 | 12-Dec-01 | | 54.7 | - | 1.83 | - | 0.0056 | - | ND> 0.005 | - | ND> 0.005 | - | 0.169 | - | 0.0084 | - | 0.0104 | - | **0.725** | 0.263 |
| | 5237-011212-104 (dup) | 12-Dec-01 | | 54.2 | - | 1.83 | - | 0.0055 | - | ND> 0.005 | - | ND> 0.005 | - | 0.132 | - | 0.0066 | - | 0.0094 | - | **0.066** | ND> 0.02 |
| | 5237-020403-104 | 3-Apr-02 | | 39.9 | - | 3.33 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | 0.0694 | - | ND> 0.005 | - | 0.0086 | - | **1.42** | ND> 0.4 |
| | 5237-020710-103 | 10-Jul-02 | | 46.4 | - | 2.19 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | 0.108 | - | 0.0063 | - | 0.0055 | - | **0.459** | ND> 0.04 |
| WS-9-34 | 5237-011008-102 | 8-Oct-01 | 24-34 | 53.3 | - | 4.31 | - | ND> 0.003 | - | ND> 0.005 | - | ND> 0.0019 | - | 0.0055 | - | ND> 0.001 | - | 0.0055 | - | **0.14** | ND> 0.02 |
| | 5237-011212-101 | 12-Dec-01 | | 60.2 | 15.6 | 7.1 | 2.24 | 0.0369 | 0.006 | ND> 0.005 | ND> 0.005 | ND> 0.005 | ND> 0.005 | 0.217 | ND> 0.001 | 0.0548 | ND> 0.005 | **0.376** | 0.0155 | **0.074** | ND> 0.02 |
| | 5237-020402-101 | 2-Apr-02 | | 45.5 | 22.7 | 4.35 | 2.59 | 0.0229 | 0.0087 | ND> 0.005 | 0.0054 | ND> 0.005 | ND> 0.005 | 0.254 | ND> 0.01 | 0.0482 | ND> 0.005 | **0.197** | ND> 0.015 | **0.11** | ND> 0.04 |
| | 5237-020710-101 | 10-Jul-02 | | 57.1 | 36.4 | 6.66 | 4.73 | 0.0365 | 0.0064 | ND> 0.005 | ND> 0.0056 | ND> 0.005 | ND> 0.0056 | 0.27 | ND> 0.0111 | 0.043 | ND> 0.0056 | **0.224** | 0.0153 | **0.074** | ND> 0.04 |
| Quality Control Samples | | | | | | | | | | | | | | | | | | | | | |
| Trip Blanks | 5237-011008-101 | 8-Oct-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-011009-106 | 9-Oct-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-011212-100 | 12-Dec-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-011213-106 | 13-Dec-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-020402-100 | 2-Apr-02 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-020403-103 | 3-Apr-02 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-020710-100 | 10-Jul-02 | NA | | | | | | | | | | | | | | | | | | |
| Water Eq. Blanks | 5237-011212-102 | 8-Oct-01 | NA | 0.05 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.01 | - | ND> 0.005 | - | ND> 0.01 | - | ND> 0.02 | ND> 0.02 |
| | 5237-011008-103 | 12-Dec-01 | NA | 0.0775 | - | ND> 0.005 | - | ND> 0.003 | - | ND> 0.005 | - | ND> 0.0019 | - | ND> 0.001 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.02 | ND> 0.02 |
| | 5237-020402-102 | 2-Apr-02 | NA | ND> 0.05 | - | 0.0059 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.01 | - | ND> 0.005 | - | 0.0359 | - | ND> 0.04 | - |
| | 5237-020710-102 | 10-Jul-02 | NA | ND> 0.05 | | ND> 0.005 | | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.01 | - | ND> 0.005 | - | 0.0079 | - | ND> 0.04 | ND> 0.04 |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | # | # | # | # | 0.052 [2] | | 0.005 [2] | | 0.003 [3] | | # | # | # | # | 0.12 [2] | | 0.005 [2] | |

Note:
# = not established
bgs = below ground surface
Diss = dissolved
EB = equipment blank
EPA = U.S. Environmental Protection Agency
mg/l = milligrams/liter
ND = not detected above detection limit indicated
ppm = parts per million

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC

**Bold** = Detected above lowest identified AWQC



SCOEPA00010068

Willamette River

Former Western Transportation
Docks and Structures
(1930-1950)

SD-062 SD-063 SD-064 SD-065 SD-067 SD-068 SD-069 SD-070 SD-072 SD-075 SD-077

MW-2 MW-3 MW-4 MW-5 MW-6 MW-8 MW-9 MW-10 MW-11 MW-12 MW-13 MW-14 MW-15

P-1 P-2 P-3 P-4 P-5 P-6 P-7 P-8 P-9 P-10 P-11

WS8-59 WS8-33 WS9-34

B-1-8 B-2-8 B-3-8 B-4-8 B-1 B-3 B-5-8 B-101-8 B-102-8 B-HQ-8 B-32 B-33 B-34 B-35 B-SU-8

GP-25 GP-26 RP-01 GP-27 RP-06 GP-11

WS-1 WS-2 WS-3 W-3-81 WS-4 WS-5 WS-6 WS-7

RP-03 (abandoned) RP-03R PZ-02

NW Natural

Wacker Siltronic

1981 Chromic / Nitric Acid Spill Location

1984 TCE Spill Location

1997 Caustic Solution Spill Location

WS10-30 location (approximate)

Wastewater Treatment Plant Spill Locations

Utility Easement

NW St. Helens Road

N

LEGEND

- Site Boundary
- Existing Structure or Feature
- Railroad Tracks
- Existing Monitoring Well Location
- EPA Sediment Sampe Location
- Select Boring Location (pre-2001)
- Push Probe Boring Location (HAI, 2001)

0 250 500

Approximate Scale in Feet

**Figure 1**

**Monitoring Well and Push Probe Location Map**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

HAHN & ASSOCIATES, INC.
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717

May 2002

Project No. 5237

SCOEPA00010069

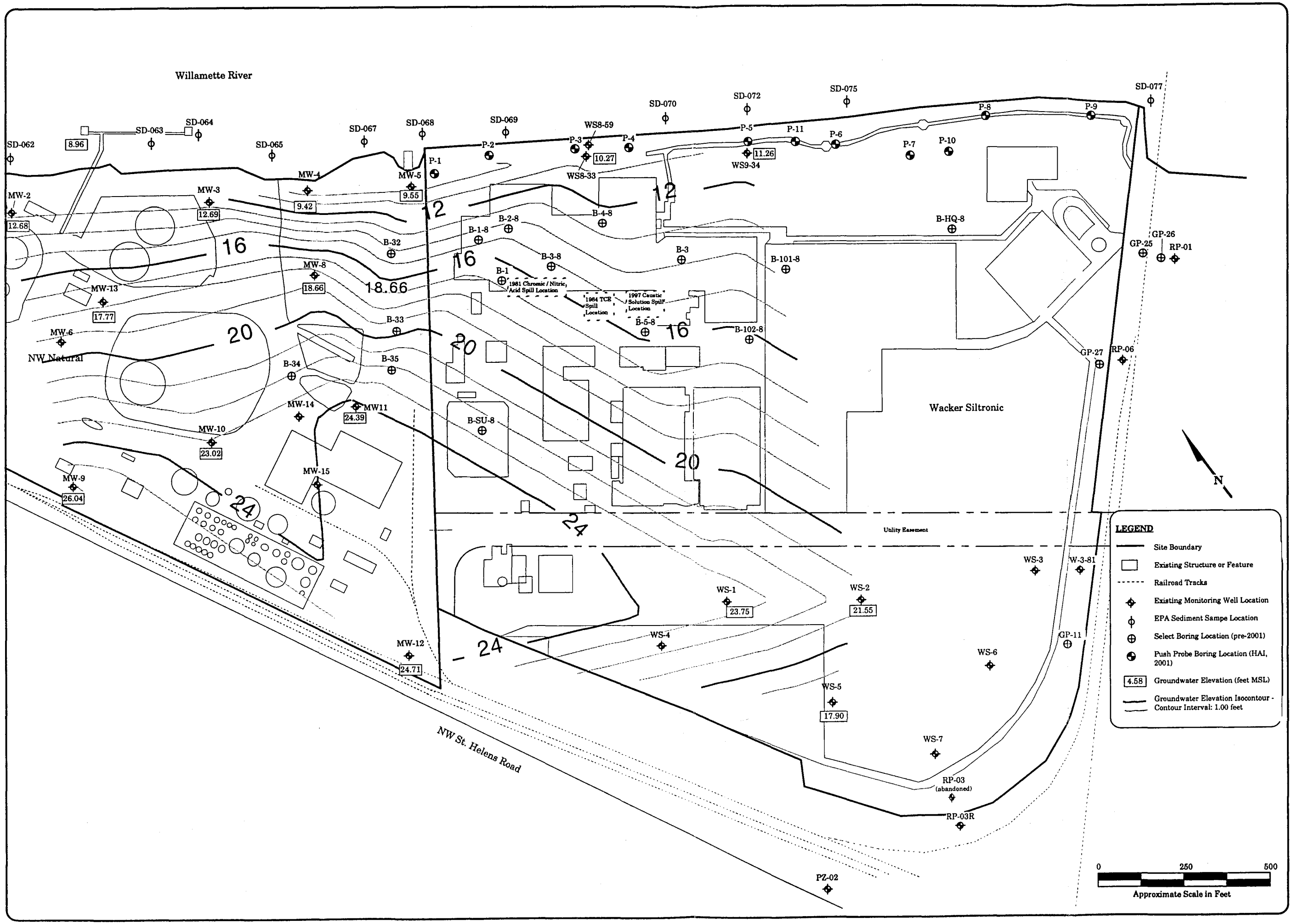



**Figure 2**

**Groundwater Elevation Map - Surficial Fill Wells**
**July 10, 2002**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon


**HAHN & ASSOCIATES, INC.**
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717


**August 2002**

**Project No. 5237**

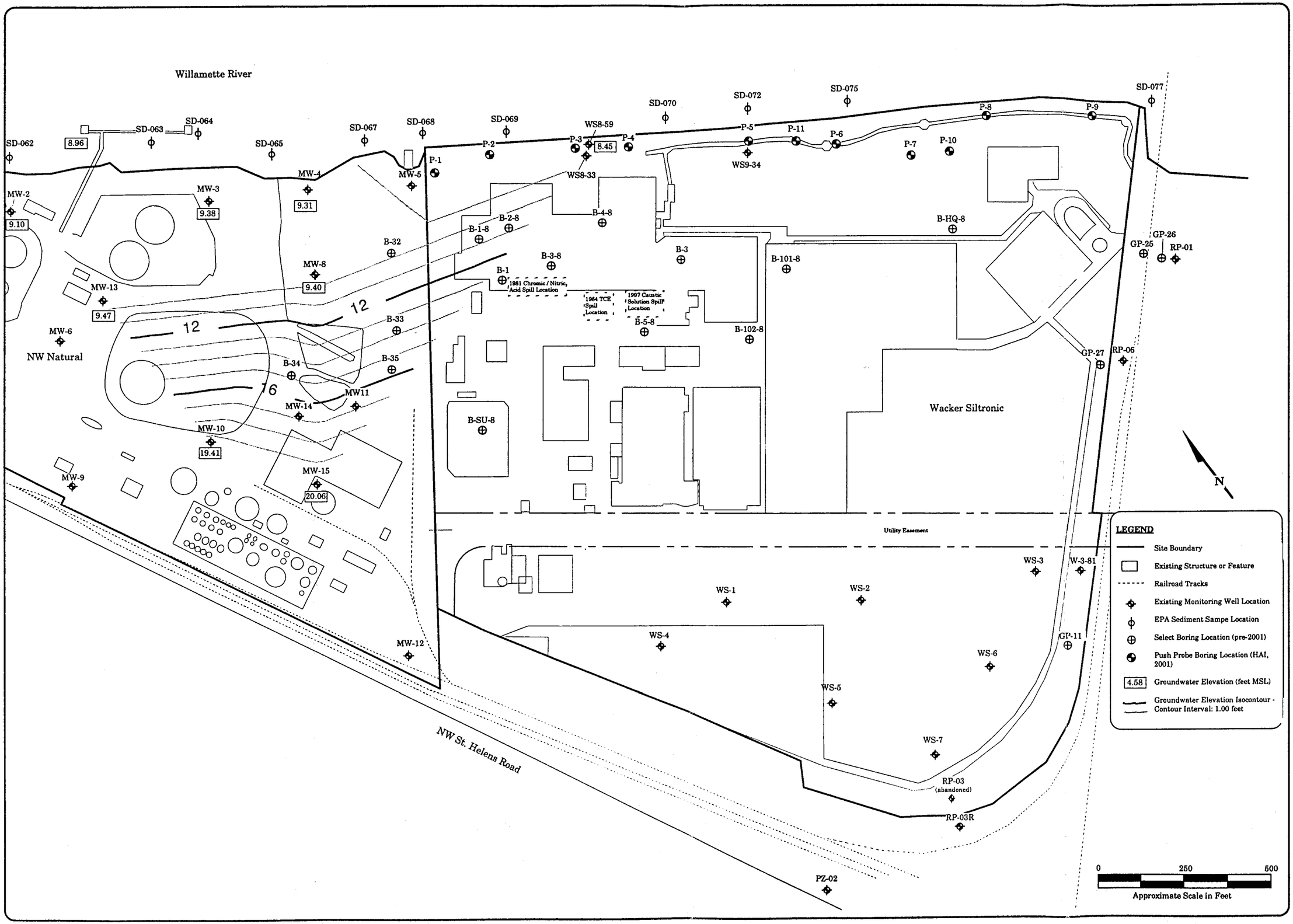



**Figure 3**

**Groundwater Elevation Map - Intermediate Wells (40 to 81 feet bgs)**
**July 10, 2002**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

**HAHN & ASSOCIATES, INC.**

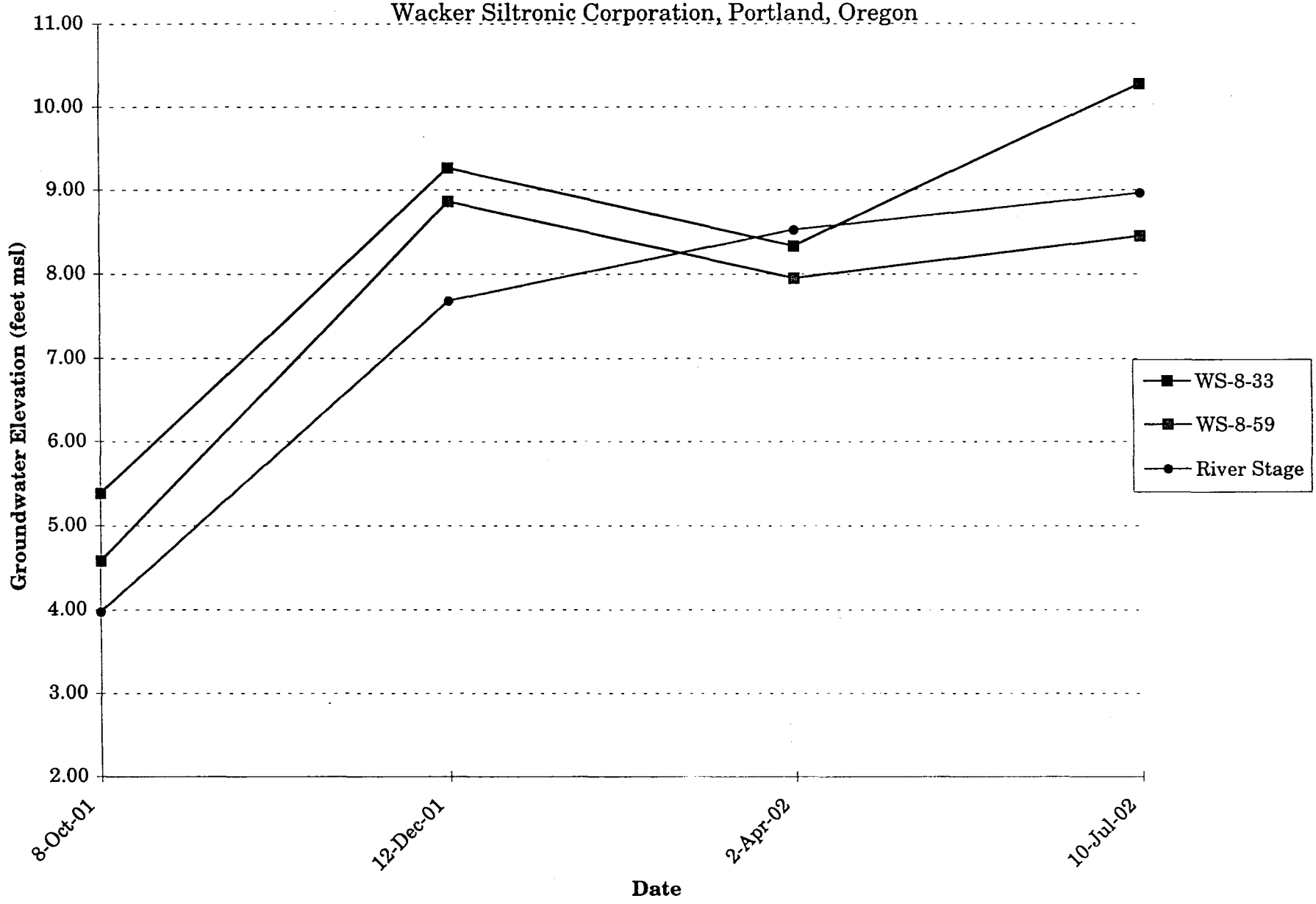
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717

**August 2002**

**Project No. 5237**

SCOEPA00010071

**Figure 4**
**Groundwater Hydrograph**
**WS-8 Series Monitoring Wells**
Wacker Siltronic Corporation, Portland, Oregon

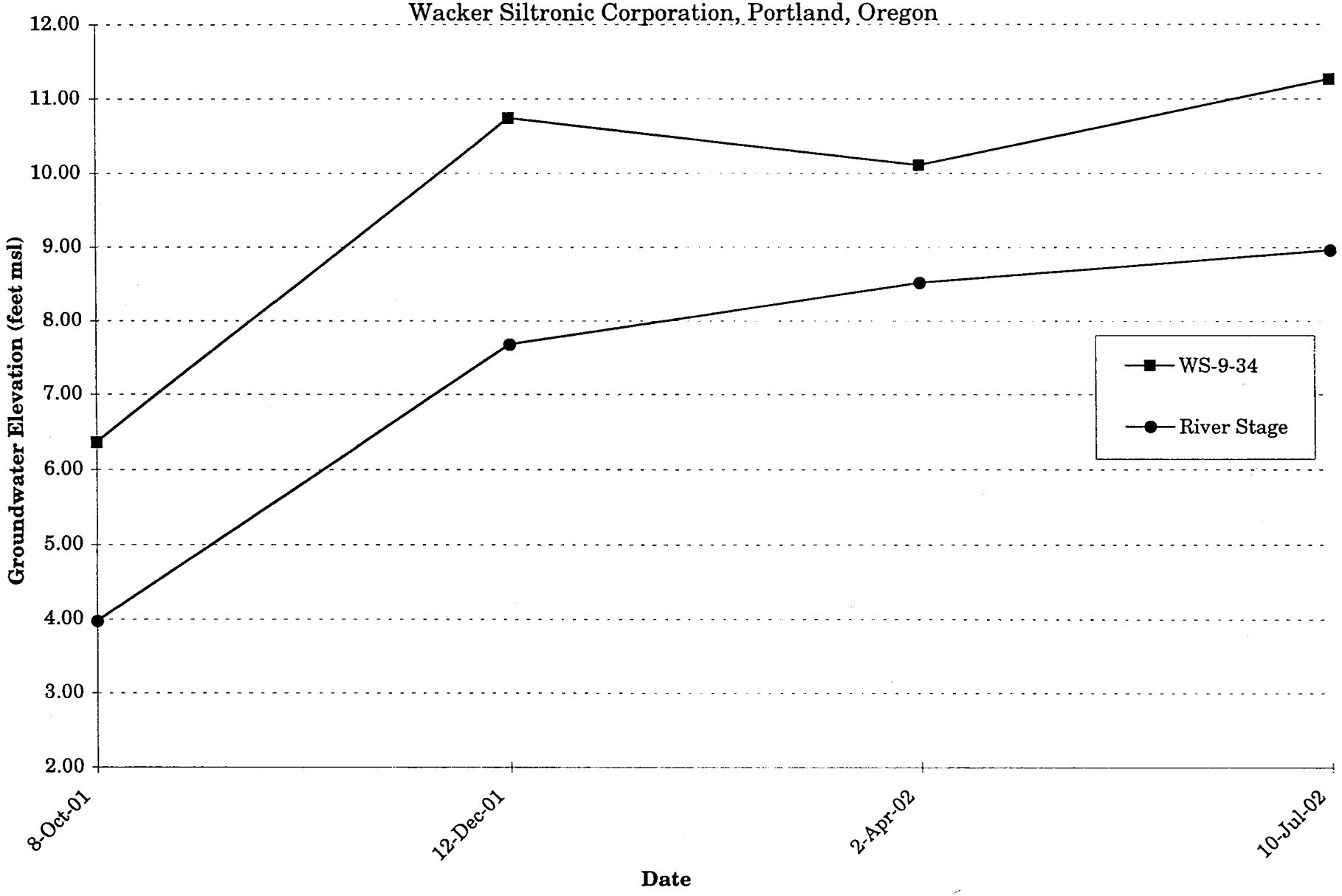



Updated: 8/12/02 RBE
File Name: 5237 GW Elevations ; Hydrograph - WS-8 Series

Project No. 5237
HAHN AND ASSOCIATES, INC.

SCOEPA00010072

**Figure 5**
**Groundwater Hydrograph**
**Well WS-9-34**
Wacker Siltronic Corporation, Portland, Oregon




Updated: 8/12/02 MSM
File Name: 5237 GW Elevations ; Hydrograph - WS-9-34

Project No. 2708
HAHN AND ASSOCIATES, INC.

SCOEPA00010073

**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL CONSULTANTS

July 15, 2002

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland OR 97201-4987

HAI Project No. 5237

SUBJECT: June 2002 Progress Report for Remedial Investigation (RI) Activities, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. Blischke:

Hahn and Associates, Inc. (HAI) has prepared this Progress Report summarizing RI work activities conducted by NW Natural that have occurred relating to the Wacker Siltronic Corporation (Wacker) property (Figure 1) during the month of June 2002. RI field activities for the site are being conducted as per the approved *Final Focused Remedial Investigation (RI) Work Plan*[1] (RI Work Plan), as well as the approved *Supplemental RI Work Plan* [2]. This Progress Report has been prepared as per an Order (DEQ No. ECVC-NWR-00-27) issued jointly to both NW Natural and Wacker by the Oregon Department of Environmental Quality (ODEQ), dated October 4, 2000. As per the referenced Order, monthly progress reports are to be prepared by the 15th day of each month, with the reporting to continue for the duration of the project.

**Summary of Activities in June 2002**

Groundwater level data collected by Wacker during a May 4, 2002 "area-wide" water level monitoring event were submitted to the ODEQ by Wacker in correspondence dated June 18, 2002 (Young to Blischke). These data, in addition to select, previously submitted data collected on the same date from Wacker area wells by representatives of NW Natural and Aventis CropScience, are summarized on Tables 1 and 2. Contoured groundwater elevation maps, depicting the Surficial Fill water-bearing zone (WBZ) and the intermediate depth interval of the Alluvial Sand WBZ during April 2002, updated to reflect the area-wide data, are included as Figures 2 and 3, respectively. As indicated on these figures, overall groundwater flow direction across the Wacker property is interpreted as being to the northeast, toward the Willamette River. One exception to the preceding is an apparent southward component of flow within the Surficial Fill WBZ at the southern portion of the property.

---

[1] Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1, 2001.

[2] Hahn and Associates, Inc. (2002). *Supplemental Remedial Investigation Work Plan, Wacker Siltronic Corporation,, 7200 NW Front Avenue, Portland, Oregon.* March 7, 2002.

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**Anticipated / Completed Activities in July and August 2002**

The fourth, and final, quarterly groundwater monitoring event associated with the three monitoring wells installed in September 2001 at the Wacker property (WS-8-33, WS-8-59, and WS-9-34) was completed by HAI on July 10, 2002. These sampling activities have been conducted synchronously with sampling activities conducted at the adjacent NW Natural-Gasco property.

Remaining Phase I RI data collection tasks to be completed at the site include: 1) completion of a continuous short-term (48 hours) groundwater elevation monitoring event; and 2) an inspection and survey of the base of the drainage ditch located on BNSF property immediately west and south of the Wacker property. Task 1, conditionally approved by the ODEQ via a July 8, 2002 electronic mail (Struck to Wyatt), will be scheduled for completion during mid to late July 2002, while Task 2 will require receipt of access approval from BNSF, the owner of the right-of-way through which the ditch runs. A proposed access agreement has been prepared by representatives of BNSF, and is currently under review by NW Natural. It is anticipated that issues related to the proposed access agreement may be identified and resolved such that the ditch survey may be completed during July or August 2002.

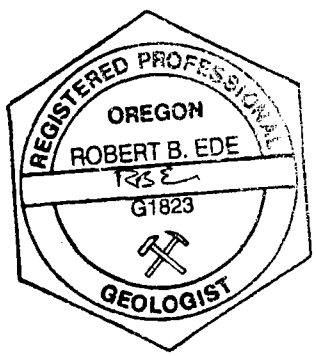
A full reporting and evaluation of the results of NW Natural's investigatory activities will be included within the Phase I Site Characterization Summary Report and the Technical Memorandum on Source Control Measures, both of which are due to the ODEQ within 90 days after completion of the Phase I RI activities. NW Natural understands that work plans and results of Wacker's own TCE-related investigation activities will be documented by Wacker and will be submitted independently by them to the ODEQ.

Should you have any questions, please contact the undersigned.

Sincerely,

Robert Ede, R.G.
Associate

rede@hahnasoc.com




c: Mr. Bob Wyatt, NW Natural
Ms. Patty Dost, Schwabe, Williamson & Wyatt
Mr. Carl Stivers, Anchor Environmental, L.L.C.
Ms. Cathryn Young, Wacker Siltronic Corporation



SCOEPA00010075

**TABLE 1 - Summary of Water Level Measurements and Groundwater Elevations: April 2, 2002 Area-Wide Groundwater Monitoring Event**
**Wacker Siltronic Corporation, Burlington Northern Santa Fe Railroad Company, and City of Portland Right-of-Way Properties**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

HAI Project No. 5237

**Elevation of Top of Casing**

| Elevation of Top of Casing (feet msl)* | | | | | | | | | | | | | | | | | River Benchmark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Wacker Siltronic Corporation Property Wells | | | | | | | | | BNSF Property Wells | | | | | | | COP ROW | |
| WS-1-27 | WS-2-27 | WS-3-32 | WS-3-81 | WS-5-24 | WS-6-29 | WS-8-33 | WS-8-59 | WS-9-34 | RP-1-31 | RP-1-51 | RP-1-65 | RP-3-30R | RP-3-52R | RP-6-30 | RP-6-87 | PZ-2-40 | (feet msl)** |
| 35.18 | 33.67 | 37.02 | 35.54 | 37.83 | 36.37 | 34.28 | 34.16 | 33.51 | 35.38 | 35.28 | 35.00 | 36.61 | 36.60 | 37.10 | 37.20 | 64.53 | 32.12 |

**Measured Water Level**

| Date Measured | Measured Water Level (feet btc) | | | | | | | | | | | | | | | | River Level[3] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | WS-1-27[1] | WS-2-27[1] | WS-3-32[2] | WS-3-81[2] | WS-5-24[1] | WS-6-29[2] | WS-8-33[3] | WS-8-59[3] | WS-9-34[3] | RP-1-31[2] | RP-1-51[2] | RP-1-65[2] | RP-3-30R[2] | RP-3-52R[2] | RP-6-30[2] | RP-6-87[2] | PZ-2-40[2] | (feet bbm) |
| 2-Apr-02 | 3.57 | 6.02 | 16.04 | 18.41 | 7.60 | 11.36 | 25.95 | 26.21 | 23.40 | 25.21 | 25.15 | 24.95 | 14.84 | 17.10 | 16.60 | 25.41 | 36.29 | 23.60 |

**Groundwater Elevation**

| Date Measured | Groundwater Elevation (feet msl)* | | | | | | | | | | | | | | | | River Stage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | WS-1-27 | WS-2-27 | WS-3-32 | WS-3-81 | WS-5-24 | WS-6-29 | WS-8-33 | WS-8-59 | WS-9-34 | RP-1-31 | RP-1-51 | RP-1-65 | RP-3-30R | RP-3-52R | RP-6-30 | RP-6-87 | PZ-2-40 | (feet msl)** |
| 2-Apr-02 | 31.61 | 27.65 | 20.98 | 17.13 | 30.23 | 25.01 | 8.33 | 7.95 | 10.11 | 10.17 | 10.13 | 10.05 | 21.77 | 19.50 | 20.50 | 11.79 | 28.24 | 8.52 |

NOTE:
* = City of Portland Datum
**River Stage data measured directly from surveyed bench mark located on north end of dock at adjacent NW Natural property.
bbm = below bench mark
BNSF = Burlington Northern Sante Fe Railroad Company
COP ROW = City of Portland Right-of-Way
btc = below top of casing
msl = mean sea level
1 = Measured by representatives of Wacker Siltronic Corporation
2 = Measured by representatives of Aventis CropScience
3 = Measured by representatives of NW Natural



SCOEPA00010076

## TABLE 2 - Summary of Water Level Measurements and Groundwater Elevations: April 2, 2002 Area-Wide Groundwater Monitoring Event
## NW Natural - Gasco Property

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Date of Elevation Survey | Elevation of Top of Casing (feet msl)* | | | | | | | | | | | | | | | | | | | | | | | | River Benchmark (feet msl)** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MW-1-22 | MW-2-32 | MW-2-61 | MW-3-26 | MW-3-56 | MW-4-35 | MW-4-57 | MW-4-101 | MW-5-32 | MW-5-100 | MW-5-175 | MW-6-32 | MW-6-61 | MW-8-29 | MW-8-56 | MW-9-29 | MW-10-25 | MW-10-61 | MW-11-32 | MW-12-36 | MW-13-30 | MW-13-61 | MW-14-110 | MW-15-50 | MW-15-66 | |
| 7-Dec-95 | 34.75 | 34.46 | 34.41 | 34.11 | 34.07 | 34.54 | 34.53 | 34.36 | 27.83 | 27.31 | 27.19 | 35.51 | 34.50 | 39.09 | 39.13 | 37.65 | 39.22 | 39.33 | 38.39 | 38.69 | 34.86 | 34.78 | 37.41 | 35.97[1] | 36.06[1] | 32.12 |

**Measured Water Level**

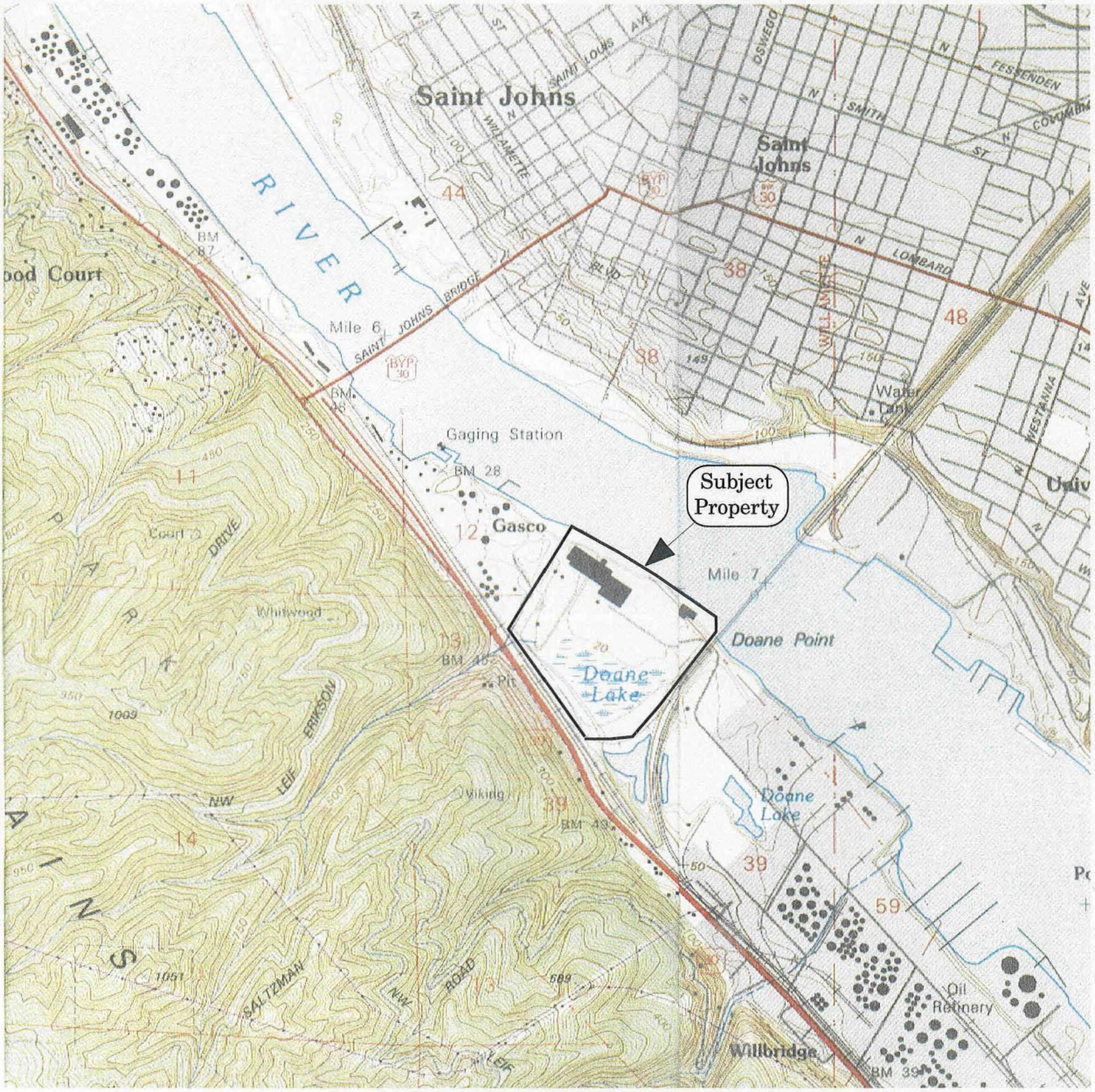
| Date Measured | Measured Water Level (feet btc) | | | | | | | | | | | | | | | | | | | | | | | | River Level (feet bbm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MW-1-22 | MW-2-32 | MW-2-61 | MW-3-26 | MW-3-56 | MW-4-35 | MW-4-57 | MW-4-101 | MW-5-32 | MW-5-100 | MW-5-175 | MW-6-32 | MW-6-61 | MW-8-29 | MW-8-56 | MW-9-29 | MW-10-25 | MW-10-61 | MW-11-32 | MW-12-36 | MW-13-30 | MW-13-61 | MW-14-110 | MW-15-50 | MW-15-66 | |
| 2-Apr-02 | 14.98 | 20.47 | 25.78 | 20.61 | 25.33 | 26.38 | 25.84 | 25.59 | 18.71 | 18.56 | 18.34 | - | - | 20.24 | 30.61 | 7.99 | 16.77 | 18.46 | 13.16 | 12.48 | 15.35 | 25.85 | 23.59 | 14.56 | 15.42 | 23.60 |

**Groundwater Elevation**

| Date Measured | Groundwater Elevation (feet msl)* | | | | | | | | | | | | | | | | | | | | | | | | River Stage (feet msl)** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MW-1-22 | MW-2-32 | MW-2-61 | MW-3-26 | MW-3-56 | MW-4-35 | MW-4-57 | MW-4-101 | MW-5-32 | MW-5-100 | MW-5-175 | MW-6-32 | MW-6-61 | MW-8-29 | MW-8-56 | MW-9-29 | MW-10-25 | MW-10-61 | MW-11-32 | MW-12-36 | MW-13-30 | MW-13-61 | MW-14-110 | MW-15-50 | MW-15-66 | |
| 2-Apr-02 | 19.77 | 13.99 | 8.63 | 13.50 | 8.74 | 8.16 | 8.69 | 8.77 | 9.12 | 8.75 | 8.85 | - | - | 18.85 | 8.52 | 29.66 | 22.45 | 20.87 | 25.23 | 26.21 | 19.51 | 8.93 | 13.82 | 21.41 | 20.64 | 8.52 |

NOTE: * = City of Portland Datum
msl = mean sea level

**Willamette River, Portland Harbor Stage, obtained from National Weather Service and adjusted to feet msl - City of Portland datum: December 1995 to December 1997. Post December 1997 River Stage data measured directly from surveyed bench mark located on north end of FAMM Dock.




0 2,000 4,000

**Scale in Feet**
**Contour Interval = 10 feet**

N

Note: Base Map from Linnton (1990) and Portland (1990), Oregon, USGS 7.5-Minute Quadrangles

| | | | |
|---|---|---|---|
| Project No. 5237<br>October 2001 | **HAHN AND ASSOCIATES**<br>**INCORPORATED**<br>ENVIRONMENTAL MANAGEMENT<br>434 NW SIXTH AVENUE, SUITE 203<br>PORTLAND, OREGON 97209<br>(503) 796-0717 | **LOCATION MAP**<br>Wacker Siltronic Corporation<br>7200 NW Front Avenue<br>Portland, Oregon | **FIGURE**<br>**1** |

Willamette River

SD-062 SD-063 SD-064 SD-065 SD-067 SD-068 SD-069 SD-070 SD-072 SD-075 SD-077

MW-2 13.99 MW-3 13.50 MW-4 8.16 MW-5 9.12 P-1 P-2 P-3 WS8-59 8.33 P-4 WS8-33 P-5 10.11 WS9-34 P-11 P-6 P-7 P-8 P-9 P-10

MW-13 19.51 MW-8 18.85 MW-6 NW Natural MW-14 MW11 25.23 MW-10 22.45 MW-15 MW-9 29.66 MW-12 26.21

B-2-8 B-1-8 B-4-8 B-32 B-3-8 B-1 B-3 B-33 B-5-8 B-34 B-35 B-SU-8 B-101-8 B-HQ-8 B-102-8

1981 Chromic / Nitric Acid Spill Location

1984 TCE Spill Location

1997 Caustic Solution Spill Location

GP-25 GP-26 RP-01 10.17 GP-27 RP-06 20.50

Wacker Siltronic

12 16 20 24 28

Utility Easement

WS-1 31.61 WS-2 27.65 WS-3 24.49 W-3-81 WS-4 WS-5 20.98 WS-6 25.01 WS-7 GP-11

RP-03 (abandoned) RP-03R 21.77

NW St. Helens Road

PZ-02

N

0 250 500

Approximate Scale in Feet

**LEGEND**

- Site Boundary
- Existing Structure or Feature
- Railroad Tracks
- Existing Monitoring Well Location
- EPA Sediment Sampe Location
- Select Boring Location (pre-2001)
- Push Probe Boring Location (HAI, 2001)
- 4.58 Groundwater Elevation (feet MSL)
- Groundwater Elevation Isocontour - Contour Interval: 1.00 feet

**Figure 2**

**Groundwater Elevation Map - Surficial Fill Wells**
**April 2, 2002**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

**HAHN & ASSOCIATES, INC.**
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717

**May 2002**

**Project No. 5237**

SCOEPA00010079

Willamette River

SD-062 SD-063 SD-064 SD-065 SD-067 SD-068 SD-069 SD-070 SD-072 SD-075 SD-077

MW-2 8.63 MW-3 8.74 MW-4 8.69 MW-5 MW-6 NW Natural MW-8 8.52 MW-9 MW-10 20.87 MW-11 MW-12 MW-13 8.93 MW-14 MW-15 20.64

P-1 P-2 P-3 P-4 P-5 P-6 P-7 P-8 P-9 P-10 P-11 7.95

WS8-59 WS8-33 WS9-34

B-1 B-1-8 B-2-8 B-3 B-3-8 B-4-8 B-5-8 B-32 B-33 B-34 B-35 B-SU-8 B-HQ-8 B-101-8 B-102-8

1981 Chromic / Nitric Acid Spill Location

1984 TCE Spill Location

1997 Caustic Solution Spill Location

GP-25 GP-26 RP-01 10.13 GP-27 RP-06 11.79 GP-11

W-3-81 17.13 WS-1 WS-2 WS-3 WS-4 WS-5 WS-6 WS-7

RP-03 (abandoned) RP-03R 19.50

PZ-02 28.24

12 16 20

Wacker Siltronic

Utility Easement

NW St. Helens Road

N

**LEGEND**

- Site Boundary
- Existing Structure or Feature
- Railroad Tracks
- Existing Monitoring Well Location
- EPA Sediment Sampe Location
- Select Boring Location (pre-2001)
- Push Probe Boring Location (HAI, 2001)
- 4.58 Groundwater Elevation (feet MSL)
- Groundwater Elevation Isocontour - Contour Interval: 1.00 feet

0 250 500

Approximate Scale in Feet

**Figure 3**

**Groundwater Elevation Map - Intermediate Wells (40 to 81 feet bgs)**
**April 2, 2002**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

**HAHN & ASSOCIATES, INC.**
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717

**May 2002**

**Project No. 5237**

SCOEPA00010080

**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL CONSULTANTS

June 14, 2002

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland OR 97201-4987

HAI Project No. 5237

SUBJECT: May 2002 Progress Report for Remedial Investigation (RI) Activities, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. Blischke:

Hahn and Associates, Inc. (HAI) has prepared this Progress Report summarizing RI work activities conducted by NW Natural that have occurred relating to the Wacker Siltronic Corporation (Wacker) property (Figure 1) during the month of May 2002. RI field activities for the site are being conducted as per the approved *Final Focused Remedial Investigation (RI) Work Plan*[1] (RI Work Plan), as well as the approved *Supplemental RI Work Plan* [2]. This Progress Report has been prepared as per an Order (DEQ No. ECVC-NWR-00-27) issued jointly to both NW Natural and Wacker by the Oregon Department of Environmental Quality (ODEQ), dated October 4, 2000. As per the referenced Order, monthly progress reports are to be prepared by the 15th day of each month, with the reporting to continue for the duration of the project.

**Summary of Activities in May 2002**

As described within the April 2002 Progress Report, on April 2, 2002, the DEQ coordinated an "area-wide" water level sampling event at Wacker and numerous properties located in the vicinity of Wacker. During May 2002, the DEQ forwarded water level measurement data to NW Natural and Wacker in correspondence dated May 9, 2002 (Blischke to Wyatt and Young), and May 28, 2002 (Blischke to Young), that were obtained during the April 2, 2002 water level sampling event by representatives of Aventis CropScience and Atofina Chemicals, Inc., respectively. Water level measurement data obtained by representatives of NW Natural at the Wacker and Gasco properties during the April 2, 2002 area-wide groundwater monitoring event were provided to the DEQ in correspondence dated May 15, 2002 (Ede to Blischke).

---

[1] Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1, 2001.

[2] Hahn and Associates, Inc. (2002). *Supplemental Remedial Investigation Work Plan, Wacker Siltronic Corporation,, 7200 NW Front Avenue, Portland, Oregon.* March 7, 2002.

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In correspondence dated May 30, 2002 (Ede to Blischke), a revised Groundwater Elevation Monitoring Plan to address remaining groundwater elevation monitoring activities at Wacker, including the implementation of a short-term continuous water level monitoring event, was provided to the ODEQ for review. This Monitoring Plan was revised to address DEQ comments (Blischke to Wyatt) dated February 20, 2002. NW Natural is presently awaiting ODEQ approval of the revised Groundwater Elevation Monitoring Plan prior to implementation.

In correspondence dated May 31, 2002 (Blischke to Wyatt and Young), the DEQ stated that no additional characterization activities by NW Natural are necessary at this time. Instead, DEQ requested that NW Natural include petroleum-related data collected during Wacker's recent TCE investigation into the pending source control evaluation to be prepared upon completion of NW Natural's focused remedial investigation activities at the site. Focused RI activities will be complete after the previously proposed survey of the drainage ditch located on the adjacent Burlington Northern and Sante Fe Railroad Company (BNSF) property is conducted.

With regard to access to the BNSF property for the purpose of completing the referenced ditch survey, a proposed Temporary Occupancy Permit and access agreement, prepared for BNSF by The Staubach Company, was received by NW Natural on May 28, 2002. The terms and conditions of the proposed access agreement are currently under review by NW Natural.

**Anticipated / Completed Activities in June and July 2002**

The fourth, and final, quarterly groundwater monitoring event associated with the three monitoring wells installed in September 2001 at the Wacker property (WS-8-33, WS-8-59, and WS-9-34) will be completed by HAI in late June or early July 2002. These sampling activities will be conducted synchronously with sampling activities conducted at the adjacent NW Natural-Gasco property, and if possible, will be coordinated with area-wide water level monitoring activities conducted by others at nearby Rhone-Poulenc / Aventis and Atofina wells and within those Wacker wells that pre-date initiation of source control investigation activities (i.e., wells WS-1 through WS-5, and WS-10).

Remaining Phase I RI data collection tasks to be completed at the site include: 1) completion of a continuous short-term (48 hours) groundwater elevation monitoring event; 2) an inspection and survey of the base of the drainage ditch located on BNSF property immediately west and south of the Wacker property; and 3) the final groundwater sampling event in late June / early July 2002. Task 1, which still needs DEQ approval, will be scheduled for completion prior to the final (June/July 2002) groundwater sampling event (assuming DEQ approval is received), while Task 2 will require receipt of access approval from BNSF, the owner of the right-of-way through which the ditch runs. As indicated above, a proposed access agreement has been prepared by representatives of BNSF, and is currently under review by NW Natural. It is anticipated that issues related to the proposed access agreement may be identified and resolved such that the ditch survey may be completed prior to the end of July 2002.



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A full reporting and evaluation of the results of NW Natural's investigatory activities will be included within the Phase I Site Characterization Summary Report and the Technical Memorandum on Source Control Measures, both of which are due to the ODEQ within 90 days after completion of the Phase I RI activities. NW Natural understands that work plans and results of Wacker's own TCE-related investigation activities will be documented by Wacker and will be submitted independently by them to the ODEQ.

Should you have any questions, please contact the undersigned.

Sincerely,

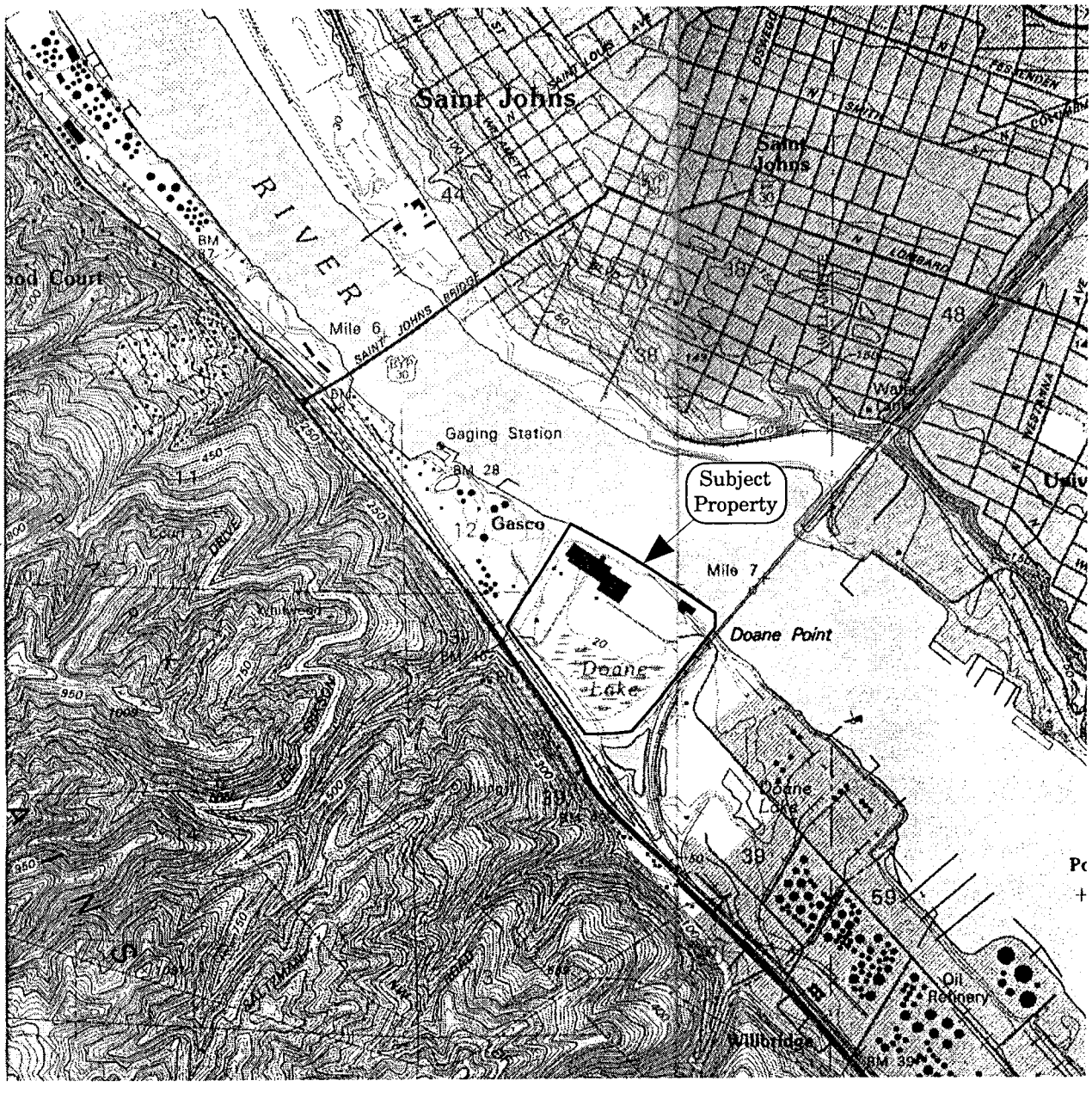
Robert Ede, R.G.
Associate

rede@hahnasoc.com

c: Mr. Bob Wyatt, NW Natural
Ms. Patty Dost, Schwabe, Williamson & Wyatt
Mr. Carl Stivers, Anchor Environmental, L.L.C.
Ms. Cathryn Young, Wacker Siltronic Corporation



SCOEPA00010083




0 2,000 4,000

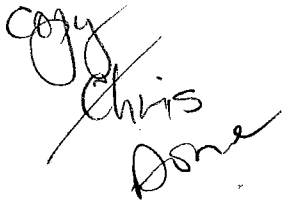
**Scale in Feet**
**Contour Interval = 10 feet**

N

Note: Base Map from Linnton (1990) and Portland (1990), Oregon, USGS 7.5-Minute Quadrangles

| | | | |
|---|---|---|---|
| Project No. 5237 | **HAHN AND ASSOCIATES** INCORPORATED | **LOCATION MAP** | **FIGURE** |
| October 2001 | ENVIRONMENTAL MANAGEMENT<br>434 NW SIXTH AVENUE, SUITE 203<br>PORTLAND, OREGON 97209<br>(503) 796-0717 | Wacker Siltronic Corporation<br>7200 NW Front Avenue<br>Portland, Oregon | 1 |

SCOEPA00010084


Copy
Chris
Done

**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL CONSULTANTS

May 15, 2002

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland OR 97201-4987

HAI Project No. 5237

SUBJECT: April 2002 Progress Report for Remedial Investigation (RI) Activities, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. Blischke:

Hahn and Associates, Inc. (HAI) has prepared this Progress Report summarizing RI work activities that have occurred relating to the Wacker Siltronic Corporation (Wacker) property during the month of April 2002 (Figure 1). RI field activities for the site are being conducted as per the approved *Final Focused Remedial Investigation (RI) Work Plan*[1] (RI Work Plan), as well as the approved *Supplemental RI Work Plan* [2]. This Progress Report has been prepared as per an Order (DEQ No. ECVC-NWR-00-27) issued jointly to both NW Natural and Wacker by the Oregon Department of Environmental Quality (ODEQ), dated October 4, 2000. As per the referenced Order, monthly progress reports are to be prepared by the 15th day of each month, with the reporting to continue for the duration of the project.

**Summary of Activities in April 2002**

The third quarterly groundwater monitoring event associated with the three monitoring wells installed in September 2001 at the Wacker property (WS-8-33, WS-8-59, and WS-9-34) was conducted by HAI on April 2 and 3, 2002. These sampling activities were conducted synchronously with sampling activities conducted at the adjacent NW Natural property, and were coordinated with area-wide water level monitoring activities conducted by others at nearby Rhone-Poulenc / Aventis and Atofina wells and within those Wacker wells that pre-date initiation of source control investigation activities (i.e., wells WS-1 through WS-5, and WS-10). Further, as requested by the ODEQ in correspondence dated March 28, 2002 (Blischke to Wyatt and Young), to assist Wacker in its trichloroethene (TCE) investigation, the analyte list for groundwater samples collected in April 2002 from select wells at the adjacent NW Natural – Gasco site was expanded to include analysis for TCE and its primary degradation products (1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, and vinyl chloride). Neither TCE, nor its degradation products, were identified within groundwater samples collected from any of the selected Gasco monitoring wells in April 2002 (i.e., wells

[1] Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1, 2001.

[2] Hahn and Associates, Inc. (2002). *Supplemental Remedial Investigation Work Plan, Wacker Siltronic Corporation,, 7200 NW Front Avenue, Portland, Oregon.* March 7, 2002.

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SCOEPA00010086

MW-4-57, MW-5-100, MW-5-175, MW-8-56, MW-10-61, MW-14-110, MW-15-50, and MW-15-66). Results of the April 2002 groundwater monitoring event at the Gasco facility will be summarized in the next progress report for the Gasco site.

Groundwater elevation data collected from the WS-8 and WS-9 series monitoring wells in April 2002, as well as during the previous two sampling events (October and December, 2001), are summarized on Table 1, while all available groundwater elevation data for the adjacent NW Natural – Gasco site are included on Table 2. Contoured groundwater elevation maps, depicting the Surficial Fill water-bearing zone (WBZ) and the intermediate depth interval of the Alluvial Sand WBZ during April 2002, are included as Figures 2 and 3. These groundwater elevation maps utilize available data from the Wacker (Table 1) the Gasco (Table 2) properties. Groundwater hydrographs for the WS-8 and WS-9 series wells are included as Figures 4 and 5.

A summary of the results of the April 2002 analyses of samples collected from the WS-8 and WS-9 series wells at Wacker, in addition to results from the previous sampling events (October and December 2001), is provided on Tables 3 through 6. As indicated on the referenced Tables, few compounds have been identified in groundwater at concentrations exceeding conservative screening levels (Ambient Water Quality Criteria). Although not relevant to groundwater, the AWQC was used as a very conservative screen with regard to the potential for groundwater discharge to impact surface water, assuming zero dilution in the receiving surface water body.

**Anticipated / Completed Activities in May and June 2002**

The fourth, and final, quarterly groundwater monitoring event associated with the three monitoring wells installed in September 2001 at the Wacker property (WS-8-33, WS-8-59, and WS-9-34) will be completed by HAI in late June or early July 2002. These sampling activities will be conducted synchronously with sampling activities conducted at the adjacent NW Natural-Gasco property, and if possible, will be coordinated with area-wide water level monitoring activities conducted by others at nearby Rhone-Poulenc / Aventis and Atofina wells and within those Wacker wells that pre-date initiation of source control investigation activities (i.e., wells WS-1 through WS-5, and WS-10).

Remaining Phase I RI data collection tasks to be completed at the site include: 1) completion of a continuous short-term (48 hours) groundwater elevation monitoring event; 2) an inspection and survey of the base of the drainage ditch located immediately west and south of the Wacker property; and 3) the final groundwater sampling event in late June 2002. Task 1, which still needs DEQ approval, will be scheduled for completion prior to the final (June 2002) groundwater sampling event, while Task 2 will require receipt of access approval from the Burlington Northern Santa Fe Railroad Company (BNSF), the owner of the right-of-way through which the ditch runs.

Access to the BNSF property was officially requested in correspondence dated November 16, 2001. In early April 2002, the request was modified to reduce the area requiring access (i.e., no access to Rhone-Poulenc / Aventis wells) in an effort to simplify BNSF's access approval process. At this time, no Access Agreement has yet been proposed by BNSF's representatives (Staubach Company, Inc.). As of April 30, 2002, the Staubach Company,



SCOEPA00010087

Inc. indicates that NW Natural's permit application has been re-forwarded to the applicable roadmaster for review.

Due to continued difficulties in gaining off-site access for completion of the remaining Phase I RI task (off-site ditch survey), an additional 45-day extension to the May 23, 2002 field work completion deadline is requested, with a new completion date to be established as July 8, 2002. Task 2 will be scheduled for completion as soon as possible after receipt of approved access from BNSF.

A full reporting and evaluation of the results of NW Natural's investigatory activities will be included within the Phase I Site Characterization Summary Report and the Technical Memorandum on Source Control Measures, both of which are due to the ODEQ within 90 days after completion of the Phase I RI activities. NW Natural understands that results of Wacker's own TCE-related investigation activities will be documented by Wacker and will be submitted independently by them to the ODEQ.

Should you have any questions, please contact the undersigned.

Sincerely,

Robert Ede, R.G.
Associate

c: Mr. Bob Wyatt, NW Natural
Ms. Patty Dost, Schwabe, Williamson & Wyatt
Mr. Carl Stivers, Anchor Environmental, L.L.C.
Ms. Cathryn Young, Wacker Siltronic Corporation

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[3] Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1, 2001.

[4] Hahn and Associates, Inc. (2002). *Supplemental Remedial Investigation Work Plan, Wacker Siltronic Corporation,, 7200 NW Front Avenue, Portland, Oregon.* March 7, 2002.



SCOEPA00010088

**TABLE 1 - Summary of Water Level Measurements and Groundwater Elevations**
Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

HAI Project No. 5237

**Elevation of Top of Casing**

| Date of Elevation Survey | Elevation of Top of Casing (feet msl)* | | | River Benchmark (feet msl)** |
|---|---|---|---|---|
| | WS-8-33 | WS-8-59 | WS-9-34 | |
| 23-Oct-01 | 34.28 | 34.16 | 33.51 | 32.12 |

**Measured Water Level**

| Date Measured | Measured Water Level (feet btc) | | | River Level (feet bbm) |
|---|---|---|---|---|
| | WS-8-33 | WS-8-59 | WS-9-34 | |
| 8-Oct-01 | 28.90 | 29.58 | 27.15 | 28.15 |
| 12-Dec-01 | 25.02 | 25.30 | 22.77 | 24.44 |
| 2-Apr-02 | 25.95 | 26.21 | 23.40 | 23.60 |

**Groundwater Elevation**

| Date Measured | Groundwater Elevation (feet msl)* | | | River Stage (feet msl)** |
|---|---|---|---|---|
| | WS-8-33 | WS-8-59 | WS-9-34 | |
| 8-Oct-01 | 5.38 | 4.58 | 6.36 | 3.97 |
| 12-Dec-01 | 9.26 | 8.86 | 10.74 | 7.68 |
| 2-Apr-02 | 8.33 | 7.95 | 10.11 | 8.52 |

NOTE: * = City of Portland Datum
**River Stage data measured directly from surveyed bench mark located on north end of dock at adjacent NW Natural property.
bbm = below bench mark
btc = below top of casing
msl = mean sea level



SCOEPA00010089

Willamette River

SD-062 8.52 SD-063 SD-064 SD-065 SD-067 SD-068 SD-069 SD-070 SD-072 SD-075 SD-077

P-1 P-2 P-3 WS8-59 7.95 P-4 P-5 P-11 P-6 P-7 P-8 P-9 P-10

WS9-34 WS8-33

MW-2 8.63 MW-3 8.74 MW-4 8.69 MW-5

B-1-8 B-2-8 B-4-8 B-32 B-3-8 B-1 B-3 B-HQ-8 B-101-8 GP-26 GP-25 RP-01 10.13

MW-8 8.52 MW-13 8.93

1981 Chromic / Nitric Acid Spill Location

1984 TCE Spill Location

1997 Caustic Solution Spill Location

B-5-8 B-102-8 B-33 B-35 B-34 MW-6 NW Natural MW11 MW-14 MW-10 20.87 MW-15 20.64 MW-9 B-SU-8

GP-27 RP-06 11.79

Wacker Siltronic

12 12 16 20 20

Utility Easement

W-3-81 17.13 WS-3 WS-1 WS-2 WS-4 WS-5 WS-6 WS-7 GP-11 MW-12

RP-03 (abandoned) RP-03R 19.50

PZ-02 28.24

NW St. Helens Road

N

**LEGEND**

- Site Boundary
- Existing Structure or Feature
- Railroad Tracks
- Existing Monitoring Well Location
- EPA Sediment Sampe Location
- Select Boring Location (pre-2001)
- Push Probe Boring Location (HAI, 2001)
- 4.58 Groundwater Elevation (feet MSL)
- Groundwater Elevation Isocontour - Contour Interval: 1.00 feet

0 250 500

Approximate Scale in Feet

**Figure 3**

**Groundwater Elevation Map - Intermediate Wells (40 to 81 feet bgs)**
**April 2, 2002**

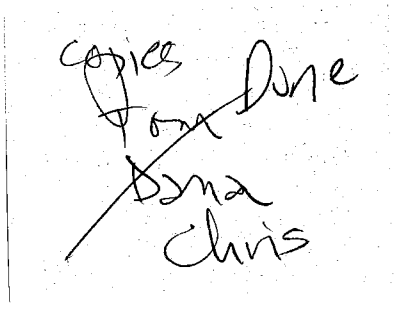
Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon


**HAHN & ASSOCIATES, INC.**
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717


**May 2002**

**Project No. 5237**

SCOEPA00010090


copies
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Dana
Chris

**TABLE 2 - Summary of Water Level Measurements and Groundwater Elevations**
Remedial Investigation
NW Natural - Gasco Facility
Portland, Oregon

Project No. 2708

**Elevation of Top of Casing**

| Date of Elevation Survey | Elevation of Top of Casing (feet msl)* | | | | | | | | | | | | | | | | | | | | | | | | River Benchmark (feet msl)** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MW-1-22 | MW-2-32 | MW-2-61 | MW-3-26 | MW-3-56 | MW-4-35 | MW-4-57 | MW-4-101 | MW-5-32 | MW-5-100 | MW-5-175 | MW-6-32 | MW-6-61 | MW-8-29 | MW-8-56 | MW-9-29 | MW-10-25 | MW-10-61 | MW-11-32 | MW-12-36 | MW-13-30 | MW-13-61 | MW-14-110 | MW-15-50 | MW-15-66 | |
| 7-Dec-95 | 34.75 | 34.46 | 34.41 | 34.11 | 34.07 | 34.54 | 34.53 | 34.36 | 27.83 | 27.31 | 27.19 | 35.51 | 34.50 | 39.09 | 39.13 | 37.65 | 39.22 | 39.33 | 38.39 | 38.69 | 34.86 | 34.78 | 37.41 | 35.97[1] | 36.06[1] | 32.12 |

**Measured Water Level**

| Date Measured | Measured Water Level (feet btc) | | | | | | | | | | | | | | | | | | | | | | | | River Level (feet bbm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MW-1-22 | MW-2-32 | MW-2-61 | MW-3-26 | MW-3-56 | MW-4-35 | MW-4-57 | MW-4-101 | MW-5-32 | MW-5-100 | MW-5-175 | MW-6-32 | MW-6-61 | MW-8-29 | MW-8-56 | MW-9-29 | MW-10-25 | MW-10-61 | MW-11-32 | MW-12-36 | MW-13-30 | MW-13-61 | MW-14-110 | MW-15-50 | MW-15-66 | |
| 5-Dec-95 | 14.15 | 15.23 | - | 15.58 | 15.79 | 16.12 | 16.39 | - | 9.46 | - | - | 16.71 | 15.77 | 19.75 | 20.61 | 6.20 | 14.98 | 13.42 | 12.69 | 9.37 | - | - | - | - | - | - |
| 5-Jan-96 | 14.47 | 20.04 | - | 19.47 | 21.85 | 22.47 | 22.38 | - | 15.57 | - | - | 14.84 | 21.58 | 19.01 | 26.74 | 7.33 | 15.20 | 16.32 | 12.19 | 10.82 | - | - | - | - | - | - |
| 12-Feb-96 | 7.74 | 8.61 | - | 8.52 | 8.63 | 9.09 | 9.10 | - | 2.41 | - | - | 9.55 | 8.97 | 16.99 | 13.56 | 3.32 | 11.11 | 8.92 | 8.95 | 5.27 | - | - | - | - | - | - |
| 18-Mar-96 | 12.44 | 18.03 | - | 17.87 | 19.66 | 20.24 | 20.21 | - | 13.37 | - | - | 12.10 | 19.39 | 15.22 | 24.54 | 6.13 | 11.95 | 14.47 | 9.42 | 9.01 | - | - | - | - | - | - |
| 16-Apr-96 | 13.65 | 18.83 | - | 18.13 | 19.47 | 20.26 | 20.07 | - | 13.36 | - | - | 13.42 | 19.51 | 15.58 | 24.44 | 6.93 | 12.63 | 15.07 | 10.12 | 9.69 | - | - | - | - | - | - |
| 10-May-96 | 13.75 | 19.47 | - | 18.98 | 22.01 | 22.58 | 22.60 | - | 15.78 | - | - | 13.30 | 21.55 | 15.77 | 26.93 | 6.94 | 12.98 | 15.90 | 10.40 | 10.24 | - | - | - | - | - | - |
| 17-Jun-96 | 13.88 | 17.40 | - | 17.40 | 18.21 | 18.61 | 18.73 | - | 11.96 | - | - | 13.40 | 18.13 | 16.00 | 23.15 | 5.03 | 13.51 | 13.96 | 10.90 | 9.98 | - | - | - | - | - | - |
| 16-Jul-96 | 15.51 | 20.71 | - | 20.07 | 24.41 | 24.30 | 24.93 | - | 17.91 | - | - | 14.60 | 23.55 | 17.26 | 29.05 | 6.65 | 15.90 | 17.21 | 11.93 | 12.43 | - | - | - | - | - | - |
| 21-Aug-96 | 16.51 | 21.80 | - | 22.24 | 26.99 | 26.77 | 27.51 | - | 20.46 | - | - | 16.17 | 26.27 | 19.18 | 31.93 | 8.47 | 16.58 | 19.43 | 13.40 | 14.53 | - | - | - | - | - | - |
| 17-Sep-96 | 17.06 | 22.06 | - | 20.61 | 28.02 | 27.15 | 28.53 | - | 21.27 | - | - | 16.94 | 26.81 | 20.13 | 32.63 | 7.52 | 16.80 | 19.30 | 14.02 | 14.86 | - | - | - | - | - | - |
| 30-Sep-96 | 17.17 | 22.24 | - | 23.32 | 27.04 | 27.46 | 27.61 | - | 20.68 | - | - | 17.08 | 27.01 | 20.19 | 32.45 | 8.70 | 16.89 | 19.84 | 14.26 | 14.97 | - | - | - | - | - | - |
| 15-Nov-96 | 16.38 | 22.02 | - | 20.76 | 26.48 | 26.85 | 27.00 | - | 19.84 | - | - | 17.00 | 25.71 | 20.63 | 31.37 | 6.61 | 16.42 | 18.38 | 14.20 | 13.85 | - | - | - | - | - | - |
| 24-Feb-97 | 12.41 | 18.71 | - | 18.61 | 20.48 | 20.82 | 21.02 | - | 14.17 | - | - | 12.83 | 19.79 | 18.43 | 25.33 | 4.35 | 14.85 | 14.33 | 11.18 | 9.71 | - | - | - | - | - | - |
| 10-Jun-97 | 12.89 | 14.23 | - | 13.80 | 14.20 | 14.70 | 14.56 | - | 7.97 | - | - | 13.81 | 14.61 | 18.56 | 19.25 | 4.84 | 16.01 | 12.20 | 12.50 | 8.49 | - | - | - | - | - | - |
| 26-Aug-97 | 15.38 | 21.70 | - | 22.61 | 26.10 | 26.56 | 25.84 | - | 19.63 | - | - | 18.53 | 25.58 | 20.31 | 31.13 | 11.71 | 17.10 | 20.16 | 14.30 | 14.13 | - | - | - | - | - | - |
| 25-Nov-97 | 14.42 | 21.50 | - | 19.25 | 24.64 | 25.14 | 24.80 | - | 18.23 | - | - | 16.29 | 24.33 | 20.85 | 29.85 | 7.85 | 16.36 | 17.89 | 13.88 | 11.79 | - | - | - | - | - | - |
| 19-Dec-97 | - | - | - | - | 22.75 | - | 23.28 | - | - | - | - | - | 22.62 | - | 27.90 | - | - | 16.90 | - | - | - | 23.71 | - | - | - | - |
| 16-Feb-98 | 12.60 | 20.13 | - | 18.65 | 23.55 | 23.25 | 24.10 | - | 17.09 | - | - | 14.29 | - | 20.05 | 28.50 | 5.33 | 15.60 | 15.89 | 12.02 | 9.72 | 14.73 | 23.98 | - | - | - | 21.91 |
| 1-Jun-98 | 14.49 | 16.97 | - | 16.61 | 16.51 | 16.90 | 17.00 | - | 10.33 | - | - | 15.75 | - | 20.05 | 21.63 | 7.25 | 14.63 | 14.36 | 12.85 | 9.83 | 15.69 | 17.11 | - | - | - | 14.57 |
| 25-Aug-98 | 17.62 | 22.74 | - | 23.68 | 27.79 | 27.32 | 28.36 | - | 21.14 | - | - | 17.73 | - | 20.89 | 32.46 | 12.67 | 14.32 | 21.19 | 14.29 | 14.97 | 17.56 | 28.22 | - | - | - | 25.72 |
| 16-Nov-98 | 18.42 | 24.59 | 28.36 | 22.20 | 27.57 | 27.32 | 28.10 | 28.29 | 20.99 | 21.19 | 21.05 | 18.23 | - | 21.19 | 32.13 | 12.10 | 14.30 | 20.81 | 14.45 | 14.92 | 17.78 | 28.11 | 24.84 | - | - | 26.32 |
| 15-Feb-99 | 11.97 | 19.02 | 23.94 | 18.27 | 23.20 | 23.94 | 23.71 | 23.75 | 16.75 | 16.72 | 16.54 | 12.35 | - | 17.66 | 27.97 | 5.11 | 12.41 | 15.34 | 10.03 | 9.51 | 13.04 | 23.62 | 20.35 | - | - | 21.94 |
| 11-May-99 | 14.32 | 20.19 | 22.99 | 18.76 | 22.44 | 22.92 | 22.99 | 22.94 | 16.06 | 15.87 | 15.68 | 13.41 | - | 16.56 | 27.31 | 8.50 | 15.82 | 16.94 | 10.82 | 11.11 | 14.03 | 22.91 | 20.62 | - | - | 21.21 |
| 20-Aug-99 | 17.37 | 22.16 | 26.95 | 21.92 | 26.31 | 25.98 | 26.81 | 26.87 | 19.73 | 19.80 | 19.62 | 19.80 | - | 19.65 | 31.04 | 12.04 | 15.00 | 20.46 | 14.25 | 14.40 | 17.18 | 26.81 | 23.93 | 15.05 | 15.37 | 25.80 |
| 25-Oct-99 | 18.48 | 24.73 | 28.77 | 24.40 | 28.05 | 28.02 | 28.49 | 28.44 | 21.56 | 21.36 | 21.11 | 19.00 | - | 20.83 | 32.78 | 13.86 | 16.40 | 22.15 | 15.60 | 16.51 | 18.52 | 28.63 | 25.68 | 16.92 | 17.28 | 26.49 |
| 27-Mar-00 | 12.88 | 20.09 | 26.94 | 19.24 | 26.27 | 25.69 | 26.80 | 26.91 | 19.36 | 19.83 | 19.64 | 14.05 | - | 19.43 | 31.08 | 6.25 | 17.70 | 17.32 | 12.90 | 11.65 | 14.45 | 26.71 | 23.11 | 14.05 | 14.68 | 25.30 |
| 15-Jun-00 | 16.26 | 21.18 | 24.08 | 20.01 | 23.56 | 24.42 | 24.14 | 24.10 | 17.40 | 17.07 | 16.86 | 16.05 | - | 19.53 | 28.42 | 10.15 | 14.74 | 18.55 | 13.36 | 13.11 | 15.82 | 24.10 | 22.02 | 14.14 | 14.96 | 21.70 |
| 4-Oct-00 | 18.15 | 23.24 | 28.92 | 22.12 | 28.42 | 28.02 | 28.95 | 28.92 | 21.93 | 21.88 | 21.69 | - | - | 20.31 | 33.46 | 13.67 | 14.09 | 22.31 | 14.15 | 16.85 | 17.32 | 28.98 | 26.31 | 17.81 | 18.66 | 26.00 |
| 20-Dec-00 | 17.98 | 22.73 | 27.13 | 19.50 | 26.89 | 26.13 | 27.27 | 26.76 | 20.33 | 19.63 | 19.31 | - | - | 19.24 | 32.12 | 12.22 | 13.02 | 20.20 | 13.09 | 15.17 | 16.70 | 27.70 | 26.05 | 16.25 | 17.08 | 25.00 |
| 27-Mar-01 | 16.91 | 21.94 | 28.05 | 20.86 | 27.35 | 27.01 | 27.91 | 28.10 | 20.66 | 21.05 | 20.88 | - | - | 19.19 | 32.07 | 11.91 | 13.74 | 20.85 | 13.63 | 14.96 | 16.81 | 27.86 | 25.24 | 16.40 | 17.23 | 25.70 |
| 28-Jun-01 | 18.02 | 23.49 | 28.58 | 24.14 | 28.11 | 27.51 | 28.52 | 28.25 | 21.59 | 21.23 | 20.97 | - | - | 21.14 | 33.04 | 13.31 | 17.27 | 22.92 | 15.25 | 16.06 | 18.06 | 28.72 | 25.88 | 17.32 | 18.11 | 27.01 |
| 8-Oct-01 | 19.24 | 26.16 | 29.85 | 25.45 | 29.10 | 29.05 | 29.68 | 28.72 | 22.67 | 22.60 | 22.45 | - | - | 21.99 | 34.11 | 15.50 | 18.28 | 23.89 | 17.10 | 18.45 | 19.41 | 29.78 | 27.51 | 19.41 | 20.19 | 28.15 |
| 12-Dec-01 | 16.73 | 22.68 | 26.54 | 20.49 | 25.81 | 24.12 | 26.33 | 26.46 | 19.01 | 19.41 | 19.21 | - | - | 21.58 | 30.43 | 9.71 | 16.50 | 19.00 | 16.00 | 13.67 | 17.89 | 26.34 | 23.66 | 15.05 | 15.86 | 24.44 |
| 2-Apr-02 | 14.98 | 20.47 | 25.78 | 20.61 | 25.33 | 26.38 | 25.84 | 25.59 | 18.71 | 18.56 | 18.34 | - | - | 20.24 | 30.61 | 7.99 | 16.77 | 18.46 | 13.16 | 12.48 | 15.35 | 25.85 | 23.59 | 14.56 | 15.42 | 23.60 |

NOTE: * = City of Portland Datum
btc = below top of casing
bbm = below bench mark
msl = mean sea level

**Willamette River, Portland Harbor Stage, obtained from National Weather Service and adjusted to feet msl - City of Portland datum: December 1995 to December 1997. Post December 1997 River Stage data measured directly from surveyed bench mark located on north end of FAMM Dock.

1=Well casing raised in January 2000. Pre-2000 top of casing elevations are: MW-15-50 (35.15 feet); MW-15-66 (35.36 feet)

**TABLE 2 - Summary of Water Level Measurements and Groundwater Elevations**
Remedial Investigation
NW Natural - Gasco Facility
Portland, Oregon

Project No. 2708

**Groundwater Elevation**

| Date Measured | Groundwater Elevation (feet msl)* | | | | | | | | | | | | | | | | | | | | | | | | | River Stage (feet msl)** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MW-1-22 | MW-2-32 | MW-2-61 | MW-3-26 | MW-3-56 | MW-4-35 | MW-4-57 | MW-4-101 | MW-5-32 | MW-5-100 | MW-5-175 | MW-6-32 | MW-6-61 | MW-8-29 | MW-8-56 | MW-9-29 | MW-10-25 | MW-10-61 | MW-11-32 | MW-12-36 | MW-13-30 | MW-13-61 | MW-14-110 | MW-15-50 | MW-15-66 | |
| 5-Dec-95 | 20.60 | 19.23 | - | 18.53 | 18.28 | 18.42 | 18.14 | - | 18.37 | - | - | 18.80 | 18.73 | 19.34 | 18.52 | 31.45 | 24.24 | 25.91 | 25.70 | 29.32 | - | - | - | - | - | 18.9 |
| 5-Jan-96 | 20.28 | 14.42 | - | 14.64 | 12.22 | 12.07 | 12.15 | - | 12.26 | - | - | 20.67 | 12.92 | 20.08 | 12.39 | 30.32 | 24.02 | 23.01 | 26.20 | 27.87 | - | - | - | - | - | 12.4 |
| 12-Feb-96 | 27.01 | 25.85 | - | 25.59 | 25.44 | 25.45 | 25.43 | - | 25.42 | - | - | 25.96 | 25.53 | 22.10 | 25.57 | 34.33 | 28.11 | 30.41 | 29.44 | 33.42 | - | - | - | - | - | 26.4 |
| 18-Mar-96 | 22.31 | 16.43 | - | 16.24 | 14.41 | 14.30 | 14.32 | - | 14.46 | - | - | 23.41 | 15.11 | 23.87 | 14.59 | 31.52 | 27.27 | 24.86 | 28.97 | 29.68 | - | - | - | - | - | 14.4 |
| 16-Apr-96 | 21.10 | 15.63 | - | 15.98 | 14.60 | 14.28 | 14.46 | - | 14.47 | - | - | 22.09 | 14.99 | 23.51 | 14.69 | 30.72 | 26.59 | 24.26 | 28.27 | 29.00 | - | - | - | - | - | 14.5 |
| 10-May-96 | 21.00 | 14.99 | - | 15.13 | 12.06 | 11.96 | 11.93 | - | 12.05 | - | - | 22.21 | 12.95 | 23.32 | 12.20 | 30.71 | 26.24 | 23.43 | 27.99 | 28.45 | - | - | - | - | - | 11.6 |
| 17-Jun-96 | 20.87 | 17.06 | - | 16.71 | 15.86 | 15.93 | 15.80 | - | 15.87 | - | - | 22.11 | 16.37 | 23.09 | 15.98 | 32.62 | 25.71 | 25.37 | 27.49 | 28.71 | - | - | - | - | - | 15.7 |
| 16-Jul-96 | 19.24 | 13.75 | - | 14.04 | 9.66 | 10.24 | 9.60 | - | 9.92 | - | - | 20.91 | 10.95 | 21.83 | 10.08 | 31.00 | 23.32 | 22.12 | 26.46 | 26.26 | - | - | - | - | - | - |
| 21-Aug-96 | 18.24 | 12.66 | - | 11.87 | 7.08 | 7.77 | 7.02 | - | 7.37 | - | - | 19.34 | 8.23 | 19.91 | 7.20 | 29.18 | 22.64 | 19.90 | 24.99 | 24.16 | - | - | - | - | - | 6.6 |
| 17-Sep-96 | 17.69 | 12.40 | - | 13.50 | 6.05 | 7.39 | 6.00 | - | 6.56 | - | - | 18.57 | 7.69 | 18.96 | 6.50 | 30.13 | 22.42 | 20.03 | 24.37 | 23.83 | - | - | - | - | - | 5.8 |
| 30-Sep-96 | 17.58 | 12.22 | - | 10.79 | 7.03 | 7.08 | 6.92 | - | 7.15 | - | - | 18.43 | 7.49 | 18.90 | 6.68 | 28.95 | 22.33 | 19.49 | 24.13 | 23.72 | - | - | - | - | - | 5.4 |
| 15-Nov-96 | 18.37 | 12.44 | - | 13.35 | 7.59 | 7.69 | 7.53 | - | 7.99 | - | - | 18.51 | 8.79 | 18.46 | 7.76 | 31.04 | 22.80 | 20.95 | 24.19 | 24.84 | - | - | - | - | - | 7.2 |
| 24-Feb-97 | 22.34 | 15.75 | - | 15.50 | 13.59 | 13.72 | 13.51 | - | 13.66 | - | - | 22.68 | 14.71 | 20.66 | 13.80 | 33.30 | 24.37 | 25.00 | 27.21 | 28.98 | - | - | - | - | - | 13.6 |
| 10-Jun-97 | 21.86 | 20.23 | - | 20.31 | 19.87 | 19.84 | 19.97 | - | 19.86 | - | - | 21.70 | 19.89 | 20.53 | 19.88 | 32.81 | 23.21 | 27.13 | 25.89 | 30.20 | - | - | - | - | - | 19.8 |
| 26-Aug-97 | 19.37 | 12.76 | - | 11.50 | 7.97 | 7.98 | 8.69 | - | 8.20 | - | - | 16.98 | 8.92 | 18.78 | 8.00 | 25.94 | 22.12 | 19.17 | 24.09 | 24.56 | - | - | - | - | - | 7.9 |
| 25-Nov-97 | 20.33 | 12.96 | - | 14.86 | 9.43 | 9.40 | 9.73 | - | 9.60 | - | - | 19.22 | 10.17 | 18.24 | 9.28 | 29.80 | 22.86 | 21.44 | 24.51 | 26.90 | - | - | - | - | - | 8.72 |
| 19-Dec-97 | - | - | - | - | 11.32 | - | 11.25 | - | - | - | - | - | 11.88 | - | 11.23 | - | - | 22.43 | - | - | - | 11.07 | - | - | - | - |
| 16-Feb-98 | 22.15 | 14.33 | - | 15.46 | 10.52 | 11.29 | 10.43 | - | 10.74 | - | - | 21.22 | - | 19.04 | 10.63 | 32.32 | 23.62 | 23.44 | 26.37 | 28.97 | 20.13 | 10.80 | - | - | - | 10.21 |
| 1-Jun-98 | 20.26 | 17.49 | - | 17.50 | 17.56 | 17.64 | 17.53 | - | 17.50 | - | - | 19.76 | - | 19.04 | 17.50 | 30.40 | 24.59 | 24.97 | 25.54 | 28.86 | 19.17 | 17.67 | - | - | - | 17.55 |
| 25-Aug-98 | 17.13 | 11.72 | - | 10.43 | 6.28 | 7.22 | 6.17 | - | 6.69 | - | - | 17.78 | - | 18.20 | 6.67 | 24.98 | 24.90 | 18.14 | 24.10 | 23.72 | 17.30 | 6.56 | - | - | - | 6.40 |
| 16-Nov-98 | 16.33 | 9.87 | 6.05 | 11.91 | 6.50 | 7.22 | 6.43 | 6.07 | 6.84 | 6.12 | 6.14 | 17.28 | - | 17.90 | 7.00 | 25.55 | 24.92 | 18.52 | 23.94 | 23.77 | 17.08 | 6.67 | 12.57 | - | - | 5.80 |
| 15-Feb-99 | 22.78 | 15.44 | 10.47 | 15.84 | 10.87 | 10.60 | 10.82 | 10.61 | 11.08 | 10.59 | 10.65 | 23.16 | - | 21.43 | 11.16 | 32.54 | 26.81 | 23.99 | 28.36 | 29.18 | 21.82 | 11.16 | 17.06 | - | - | 10.18 |
| 11-May-99 | 20.43 | 14.27 | 11.42 | 15.35 | 11.63 | 11.62 | 11.54 | 11.42 | 11.77 | 11.44 | 11.51 | 22.10 | - | 22.53 | 11.82 | 29.15 | 23.40 | 22.39 | 27.57 | 27.58 | 20.83 | 11.87 | 16.79 | - | - | 10.91 |
| 20-Aug-99 | 17.38 | 12.30 | 7.46 | 12.19 | 7.76 | 8.56 | 7.72 | 7.49 | 8.10 | 7.51 | 7.57 | 15.71 | - | 19.44 | 8.09 | 25.61 | 24.22 | 18.87 | 24.14 | 24.29 | 17.68 | 7.97 | 13.48 | 20.10 | 19.99 | 6.32 |
| 25-Oct-99 | 16.27 | 9.73 | 5.64 | 9.71 | 6.02 | 6.52 | 6.04 | 5.92 | 6.27 | 5.95 | 6.08 | 16.51 | - | 18.26 | 6.35 | 23.79 | 22.82 | 17.18 | 22.79 | 22.18 | 16.34 | 6.15 | 11.73 | 18.23 | 18.08 | 5.63 |
| 27-Mar-00 | 21.87 | 14.37 | 7.47 | 14.87 | 7.80 | 8.85 | 7.73 | 7.45 | 8.47 | 7.48 | 7.55 | 21.46 | - | 19.66 | 8.05 | 31.40 | 21.52 | 22.01 | 25.49 | 27.04 | 20.41 | 8.07 | 14.30 | 21.92 | 21.38 | 6.82 |
| 15-Jun-00 | 18.49 | 13.28 | 10.33 | 14.10 | 10.51 | 10.12 | 10.39 | 10.26 | 10.43 | 10.24 | 10.33 | 19.46 | - | 19.56 | 10.71 | 27.50 | 24.48 | 20.78 | 25.03 | 25.58 | 19.04 | 10.68 | 15.39 | 21.83 | 21.10 | 10.42 |
| 4-Oct-00 | 16.60 | 11.22 | 5.49 | 11.99 | 5.65 | 6.52 | 5.58 | 5.44 | 5.90 | 5.43 | 5.50 | - | - | 18.78 | 5.67 | 23.98 | 25.13 | 17.02 | 24.24 | 21.84 | 17.54 | 5.80 | 11.10 | 18.16 | 17.40 | 6.12 |
| 20-Dec-00 | 16.77 | 11.73 | 7.28 | 14.61 | 7.18 | 8.41 | 7.26 | 7.60 | 7.50 | 7.68 | 7.88 | - | - | 19.85 | 7.01 | 25.43 | 26.20 | 19.13 | 25.30 | 23.52 | 18.16 | 7.08 | 11.36 | 19.72 | 18.98 | 7.12 |
| 27-Mar-01 | 17.84 | 12.52 | 6.36 | 13.25 | 6.72 | 7.53 | 6.62 | 6.26 | 7.17 | 6.26 | 6.31 | - | - | 19.90 | 7.06 | 25.74 | 25.48 | 18.48 | 24.76 | 23.73 | 18.05 | 6.92 | 12.17 | 19.57 | 18.83 | 6.42 |
| 28-Jun-01 | 16.73 | 10.97 | 5.83 | 9.97 | 5.96 | 7.03 | 6.01 | 6.11 | 6.24 | 6.08 | 6.22 | - | - | 17.95 | 6.09 | 24.34 | 21.95 | 16.41 | 23.14 | 22.63 | 16.80 | 6.06 | 11.53 | 18.65 | 17.95 | 5.11 |
| 8-Oct-01 | 15.51 | 8.30 | 4.56 | 8.66 | 4.97 | 5.49 | 4.85 | 5.64 | 5.16 | 4.71 | 4.74 | - | - | 17.10 | 5.02 | 22.15 | 20.94 | 15.44 | 21.29 | 20.24 | 15.45 | 5.00 | 9.90 | 16.56 | 15.87 | 3.97 |
| 12-Dec-01 | 18.02 | 11.78 | 7.87 | 13.62 | 8.26 | 10.42 | 8.20 | 7.90 | 8.82 | 7.90 | 7.98 | - | - | 17.51 | 8.70 | 27.94 | 22.72 | 20.33 | 22.39 | 25.02 | 16.97 | 8.44 | 13.75 | 20.92 | 20.20 | 7.68 |
| 2-Apr-02 | 19.77 | 13.99 | 8.63 | 13.50 | 8.74 | 8.16 | 8.69 | 8.77 | 9.12 | 8.75 | 8.85 | - | - | 18.85 | 8.52 | 29.66 | 22.45 | 20.87 | 25.23 | 26.21 | 19.51 | 8.93 | 13.82 | 21.41 | 20.64 | 8.52 |

NOTE: * = City of Portland Datum
msl = mean sea level

**Willamette River, Portland Harbor Stage, obtained from National Weather Service and adjusted to feet msl - City of Portland datum: December 1995 to December 1997. Post December 1997 River Stage data measured directly from surveyed bench mark located on north end of FAMM Dock.

1=Well casing raised in January 2000. Pre-2000 top of casing elevations are: MW-15-50 (35.15 feet); MW-15-66 (35.36 feet)



SCOEPA00010093

**TABLE 3**
**Summary of Analytical Results for Groundwater Samples: Monitoring Wells**
**Detected Volatile Organic Compounds by EPA Method 8260**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Well Number | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Analytical Results – ug/l (ppb) VOCs by EPA Method 8260 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Aromatic VOCs (AVOCs) | | | | | Halogenated VOCs (HVOCs) | | | | | | |
| | | | | Benzene | Ethylbenzene | Toluene | Xylenes | Naphthalene | 1,1-DCE | cis-1,2-DCE | trans-1,2-DCE | TCE | Vinyl Chloride | Other VOCs | Total AVOCs | Total HVOCs |
| WS-8-33 | 5237-011009-107 | 9-Oct-01 | 23-33 | **107.** | 27.9 | ND> 10. | ND> 20. | **841.** | ND> 10. | ND> 10. | ND> 10. | ND> 10. | ND> 12. | 1,2,4-TMB = 18.8 | 994.7 | ND |
| | 5237-011213-105 | 13-Dec-01 | | 68. | 29.6 | ND> 5. | 23.2 | 455. | ND> 5. | ND> 5. | ND> 5. | ND> 5. | ND> 6. | 1,2,4-TMB = 23.1 | 598.9 | ND |
| | 5237-020403-105 | 3-Apr-02 | | **89.1** | 19.5 | 2.07 | 20.48 | 327. | ND> 1. | ND> | ND> 1. | ND> 1. | ND> 1.2 | 1,2,4-TMB = 9.56; 1,3,5-TMB=2.49; IPB=2.38 | 472.6 | ND |
| | 5237-020403-106 (dup) | 3-Apr-02 | | **87.4** | 18. | 2.14 | 18.5 | 216. | ND> 1. | ND> | ND> 1. | ND> 1. | ND> 1.2 | 1,2,4-TMB = 7.78; 1,3,5-TMB=2.16; IPB=2.12 | 354.1 | ND |
| WS-8-59 | 5237-011008-104 | 8-Oct-01 | 49-59 | 14.7 | ND> 1. | ND> 1. | ND> 2. | 38.9 | ND> 1. | 251. | ND> 1. | ND> 1. | 92.4 | ND | 53.6 | 343.4 |
| | 5237-011008-105 (dup) | 8-Oct-01 | | 21.4 | ND> 1. | 2.02 | ND> 2. | 49.9 | ND> 1. | 345. | ND> 1. | ND> 1. | 129. | ND | 73.3 | 474. |
| | 5237-011212-103 | 12-Dec-01 | | 26.8 | ND> 1. | 1.27 | 2.66 | 13.9 | ND> 1.5 | 409. | 2.2 | 3.53 | 332. | ND | 44.6 | 746.7 |
| | 5237-011212-104 (dup) | 12-Dec-01 | | 27. | ND> 1. | 1.32 | 2.57 | 12.4 | 1.03 | 398. | 2.15 | 3.39 | 306. | ND | 43.3 | 710.6 |
| | 5237-020403-104 | 3-Apr-02 | | 13. | ND> 1. | ND> 1. | 1.11 | ND> 2. | ND> 1. | 99.6 | ND> 1. | ND> 1. | 136. | ND | 14.1 | 235.6 |
| WS-9-34 | 5237-011008-102 | 8-Oct-01 | 24-34 | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 5. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| | 5237-011212-101 | 12-Dec-01 | | ND> 1. | ND> 1. | ND> 1. | ND> 2. | 2.04 | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | 2. | ND |
| | 5237-020402-101 | 2-Apr-02 | | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| Quality Control Samples | | | | | | | | | | | | | | | | |
| Trip Blanks | 5237-011008-101 | 8-Oct-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 5. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| | 5237-011212-100 | 12-Dec-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| | 5237-011213-106 | 13-Dec-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| | 5237-011009-106 | 9-Oct-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| | 5237-020402-100 | 2-Apr-02 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| | 5237-020403-103 | 3-Apr-02 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| Water EB | 5237-011008-103 | 8-Oct-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 5. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | acetone = 149.0 | ND | ND |
| | 5237-011212-102 | 12-Dec-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | acetone = 54.7 | ND | ND |
| | 5237-020402-102 | 2-Apr-02 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | 71. [3] | 29,000. [3] | 200,000. [3] | # | 620. [4] | # | 11,600. [4] | 140,000. [3] | 81. [3] | 525. [3] | # | # | # |

Note:
# = not established
AVOCs = aromatic volatile organic compounds
bgs = below ground surface
DCB = dichlorobenzene
DCE = dichloroethene
EB = equipment blanks
EPA = U.S. Environmental Protection Agency
HVOCs = halogenated volatile organic compounds
IPB = isopropylbenzene
ND = not detected above detection limit indicated
ppb = parts per billion
TCE = trichloroethene
TMB = trimethylbenzene
ug/l = micrograms/liter
VOCs = volatile organic compounds

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Human Fish Consumption Criteria of AWQC
3 = Reference Level based on Lowest Observable Health Effect Level for Freshwater, as provided within NOAA Screening Quick Reference Tables, updated September 1999
**Bold** = Detected above lowest identified AWQC

**TABLE 4**
**Summary of Analytical Results for Groundwater Samples: Monitoring Wells**
**Polynuclear Aromatic Hydrocarbons by EPA Method 8270 SIM**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| PAHs by EPA Method 8270 (SIM) | | | | Analytical Results ug/l (ppb) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Carcinogenic PAHs | | | | | | | Non-carcinogenic PAHs | | | | | | | | | |
| Well Number | HAI Sample Number[1] | Sample Date | Screen Interval (feet bgs) | Benzo (a) anthracene | Benzo (b) fluoranthene | Benzo (k) fluoranthene | Benzo (a) pyrene | Chrysene | Dibenzo (a,h) anthracene | Indeno (1,2,3-cd) pyrene | Acenaphthene | Acenaphthylene | Anthracene | Benzo (g,h,i) perylene | Fluoranthene | Fluorene | Naphthalene | Phenanthrene | Pyrene | Total PAHs |
| WS-8-33 | 5237-011009-107 | 9-Oct-01 | 23-33 | **0.55** | **0.19** | ND> 0.1 | **0.27** | **0.6** | ND> 0.1 | **0.11** | 98.7 | 1.17 | 8.42 | 0.15 | 7.83 | 32.5 | 485. | 85. | 7.65 | 728.1 |
| | 5237-011213-105 | 13-Dec-01 | | **0.25** | **0.1** | ND> 0.1 | **0.27** | **0.3** | ND> 0.1 | **0.11** | 105. | 2.35 | 11.9 | ND> 0.1 | 7.35 | 31.9 | 287. | 70.5 | 7.15 | 524.2 |
| | 5237-020403-105 | 3-Apr-02 | | **0.31** | ND> 0.1 | ND> 0.1 | ND> 0.1 | **0.42** | ND> 0.1 | ND> 0.1 | 91.6 | 1.01 | 6.43 | ND> 0.1 | 7.18 | 18.4 | 110. | 34.1 | 5.16 | 274.6 |
| | 5237-020403-106 (dup) | 3-Apr-02 | | **0.32** | ND> 0.1 | ND> 0.1 | ND> 0.1 | **0.44** | ND> 0.1 | ND> 0.1 | 84. | 1.39 | 7.14 | ND> 0.1 | 8.2 | 19.5 | 101. | 33.8 | 6.38 | 262.2 |
| WS-8-59 | 5237-011008-104 | 8-Oct-01 | 49-59 | **0.25** | ND> 0.1 | ND> 0.1 | ND> 0.1 | **0.29** | ND> 0.1 | ND> 0.1 | 18.5 | 0.38 | 4.2 | ND> 0.1 | 5.8 | 7.9 | 22.7 | 31.8 | 6.4 | 98.2 |
| | 5237-011008-105 (dup) | 8-Oct-01 | | **0.2** | ND> 0.1 | ND> 0.1 | ND> 0.1 | **0.24** | ND> 0.1 | ND> 0.1 | 18.9 | 0.39 | 4.1 | ND> 0.1 | 5.5 | 7.9 | 22.5 | 29.8 | 6.3 | 95.8 |
| | 5237-011212-103 | 12-Dec-01 | | **0.32** | **0.1** | **0.1** | **0.14** | **0.41** | ND> 0.1 | ND> 0.1 | 12.9 | 0.24 | 2.97 | 0.1 | 4.72 | 4.77 | 10.5 | 22.8 | 5.07 | 65.1 |
| | 5237-011212-104 (dup) | 12-Dec-01 | | **0.23** | ND> 0.1 | ND> 0.1 | ND> 0.1 | **0.29** | ND> 0.1 | ND> 0.1 | 12.6 | 0.23 | 2.94 | ND> 0.1 | 4.46 | 5.13 | 10.8 | 21.8 | 4.49 | 63. |
| | 5237-020403-104 | 3-Apr-02 | | **0.16** | ND> 0.1 | ND> 0.1 | ND> 0.1 | **0.24** | ND> 0.1 | ND> 0.1 | 5.03 | ND> 0.1 | 1.91 | ND> 0.1 | 3.5 | 2.34 | 1.13 | 9.9 | 2.57 | 26.8 |
| WS-9-34 | 5237-011008-102 | 8-Oct-01 | 24-34 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | 2.07 | 0.15 | ND> 0.1 | ND> 0.1 | 0.36 | 0.18 | 0.45 | ND> 0.1 | 0.38 | 3.6 |
| | 5237-011212-101 | 12-Dec-01 | | **0.11** | **0.1** | **0.1** | **0.15** | **0.17** | ND> 0.1 | **0.12** | 17.8 | 0.33 | 0.33 | 0.17 | 1.91 | 6.43 | 0.4 | 2.45 | 1.74 | 32.3 |
| | 5237-020402-101 | 2-Apr-02 | | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | 17.5 | 0.19 | 0.44 | ND> 0.1 | 1.59 | 1.8 | ND> 0.1 | 4.81 | ND> 0.1 | 26.3 |
| Quality Control Samples | | | | | | | | | | | | | | | | | | | | |
| Trip Blanks | 5237-011008-101 | 8-Oct-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-011212-100 | 12-Dec-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-011213-106 | 13-Dec-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-011009-106 | 9-Oct-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-020402-100 | 2-Apr-02 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-020403-103 | 3-Apr-02 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Water EB | 5237-011008-103 | 8-Oct-01 | NA | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND |
| | 5237-011212-102 | 12-Dec-01 | NA | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND |
| | 5237-020402-102 | 2-Apr-02 | NA | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | 0.049 [3] | 0.049 [2] | 0.049 [3] | 0.049 [3] | 0.049 [3] | 0.049 [3] | 0.049 [3] | 2,700. [2] | # | 110,000. [3] | # | 370. [3] | 14,000. [3] | 620. [4] | # | 11,000. [2] | # |

Note:
# = not established
bgs = below ground surface
EB = equipment blanks
EPA = U.S. Environmental Protection Agency
ND = not detected above detection limit indicated
PAHs = polynuclear aromatic hydrocarbons
ppb = parts per billion
ug/l = micrograms per liter

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC
4 = Reference Level based on Lowest Observable Health Effect Level for Freshwater, as provided within NOAA Screening Quick Reference Tables, updated September 1999
**Bold** = Detected above lowest identified AWQC



SCOEPA00010095

**TABLE 5**
**Summary of Analytical Results for Groundwater Samples: Monitoring Wells**
**Detected Semi-Volatile Organic Compounds by EPA Method 8270C**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| SVOCs by EPA Method 8270 | | | | Analytical Results ug/l (ppb) | | | |
|---|---|---|---|---|---|---|---|
| Well Number | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Carbazole | Dibenzofuran | 2-Methylnaphthalene | PAHs |
| WS-8-33 | 5237-011009-107 | 9-Oct-01 | 23-33 | 14.7 | 4.26 | 59.2 | See Table 2 |
| | 5237-011213-105 | 13-Dec-01 | | 45.2 | 3.97 | 65.8 | See Table 2 |
| | 5237-020403-105 | 3-Apr-02 | | 11.5 | 2.12 | 5.48 | See Table 2 |
| | 5237-020403-106 (dup) | 3-Apr-02 | | - | - | - | See Table 2 |
| WS-8-59 | 5237-011008-104 | 8-Oct-01 | 49-59 | ND> 4. | ND> 2. | 6.74 | See Table 2 |
| | 5237-011008-105 (dup) | 8-Oct-01 | | ND> 4. | ND> 2. | 7.17 | See Table 2 |
| | 5237-011212-103 | 12-Dec-01 | | ND> 4. | ND> 2. | ND> 2. | See Table 2 |
| | 5237-011212-104 (dup) | 12-Dec-01 | | ND> 4. | ND> 2. | ND> 2. | See Table 2 |
| | 5237-020403-104 | 3-Apr-02 | | ND> 8. | ND> 4. | ND> 4. | See Table 2 |
| WS-9-34 | 5237-011008-102 | 8-Oct-01 | 24-34 | ND> 4. | ND> 2. | ND> 2. | See Table 2 |
| | 5237-011212-101 | 12-Dec-01 | | ND> 4. | ND> 2. | ND> 2. | See Table 2 |
| | 5237-020402-101 | 2-Apr-02 | | ND> 8. | ND> 4. | ND> 4. | See Table 2 |
| Quality Control Samples | | | | | | | |
| Trip Blanks | 5237-011008-101 | 8-Oct-01 | NA | - | - | - | - |
| | 5237-011212-100 | 12-Dec-01 | NA | - | - | - | - |
| | 5237-011009-106 | 9-Oct-01 | NA | - | - | - | - |
| | 5237-011213-106 | 13-Dec-01 | NA | - | - | - | - |
| Water EB | 5237-011008-103 | 8-Oct-01 | NA | ND> 4. | ND> 2. | ND> 2. | See Table 2 |
| | 5237-011212-102 | 12-Dec-01 | NA | ND> 4. | ND> 2. | ND> 2. | See Table 2 |
| | 5237-020402-102 | 2-Apr-02 | NA | - | - | - | See Table 2 |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | # | # | # | # |

Note:
bgs = below ground surface
EB = equipment blanks
EPA = U.S. Environmental Protection Agency
ND = Not detected above detection limit indicated
PAHs = polynuclear aromatic hydrocarbons
ppb = parts per billion
ug/l = micrograms/liter
# = not established

1 = Ambient Water Quality Criteria (EPA 822-Z-99-001)



SCOEPA00010096

**TABLE 6**
**Summary of Analytical Results for Groundwater Samples: Monitoring Wells**
**Metals and Cyanide**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Well Number | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Analytical Results – mg/l (ppm) Total Metals by EPA Methods 6010, 200.7 and/or 7000 Series | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Antimony | Antimony, Diss | Arsenic | Arsenic, Diss | Barium | Barium, Diss | Cadmium | Cadmium, Diss | Chromium | Chromium, Diss | Cobalt | Cobalt, Diss | Copper | Copper, Diss | Iron | Iron, Diss | Lead | Lead, Diss |
| WS-8-33 | 5237-011009-107 | 9-Oct-01 | 23-33 | ND> 0.003 | - | **0.0063** | - | 0.184 | - | ND> 0.001 | - | 0.0069 | - | 0.0041 | - | **0.0264** | - | 117. | - | **0.0082** | - |
| | 5237-011213-105 | 13-Dec-01 | | ND> 0.005 | - | **0.0162** | - | 0.142 | - | ND> 0.002 | - | 0.005 | - | 0.005 | - | 0.005 | - | 76.6 | - | ND> 0.005 | - |
| | 5237-020403-105 | 3-Apr-02 | | ND> 0.005 | ND> 0.005 | **0.018** | 0.0148 | 0.115 | 0.104 | ND> 0.005 | ND> 0.002 | ND> 0.005 | ND> 0.005 | ND> 0.005 | ND> 0.005 | ND> 0.005 | ND> 0.015 | 90.9 | 81.5 | ND> 0.005 | ND> 0.01 |
| | 5237-020403-106 (dup) | 3-Apr-02 | | ND> 0.005 | - | **0.0174** | - | 0.114 | - | ND> 0.002 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | 89.6 | - | ND> 0.005 | - |
| WS-8-59 | 5237-011008-104 | 8-Oct-01 | 49-59 | ND> 0.003 | - | ND> 0.005 | - | 0.153 | - | ND> 0.001 | - | ND> 0.005 | - | ND> 0.001 | - | 0.0055 | - | 49.6 | - | ND> 0.005 | - |
| | 5237-011008-105 (dup) | 8-Oct-01 | | ND> 0.003 | - | ND> 0.005 | - | 0.142 | - | ND> 0.001 | - | ND> 0.005 | - | ND> 0.001 | - | 0.0037 | - | 47. | - | ND> 0.005 | - |
| | 5237-011212-103 | 12-Dec-01 | | ND> 0.005 | - | ND> 0.005 | - | 0.123 | - | ND> 0.002 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | 48.1 | - | ND> 0.005 | - |
| | 5237-011212-104 (dup) | 12-Dec-01 | | ND> 0.005 | - | ND> 0.005 | - | 0.119 | - | ND> 0.002 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | 47.2 | - | ND> 0.005 | - |
| | 5237-020403-104 | 3-Apr-02 | | ND> 0.005 | - | ND> 0.005 | - | 0.0931 | - | ND> 0.002 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | 46.8 | - | ND> 0.005 | - |
| WS-9-34 | 5237-011008-102 | 8-Oct-01 | 24-34 | ND> 0.003 | - | ND> 0.005 | - | 0.246 | - | ND> 0.001 | - | ND> 0.005 | - | 0.0281 | - | 0.0074 | - | 33.9 | - | ND> 0.005 | - |
| | 5237-011212-101 | 12-Dec-01 | | 0.0067 | 0.0108 | **0.0607** | ND> 0.005 | 0.923 | 0.0348 | ND> 0.002 | ND> 0.002 | **0.0207** | ND> 0.005 | 0.0437 | 0.0112 | **0.0431** | ND> 0.005 | 188. | 88. | **0.197** | ND> 0.005 |
| | 5237-020402-101 | 2-Apr-02 | | ND> 0.005 | 0.0086 | **0.038** | 0.007 | 0.607 | 0.0467 | ND> 0.002 | ND> 0.002 | **0.0187** | ND> 0.005 | 0.0273 | 0.0132 | **0.0391** | ND> 0.015 | 150. | 37.7 | **0.0948** | ND> 0.01 |
| Quality Control Samples | | | | | | | | | | | | | | | | | | | | | |
| Trip Blanks | 5237-011008-101 | 8-Oct-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-011009-106 | 9-Oct-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-011212-100 | 12-Dec-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-011213-106 | 13-Dec-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-020402-100 | 2-Apr-02 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-020403-103 | 3-Apr-02 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Water EB | 5237-011212-102 | 12-Dec-01 | NA | ND> 0.003 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.002 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | 0.0222 | - | ND> 0.005 | - |
| | 5237-011008-103 | 8-Oct-01 | NA | ND> 0.003 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.001 | - | ND> 0.005 | - | ND> 0.001 | - | ND> 0.001 | - | 0.0417 | - | ND> 0.005 | - |
| | 5237-020402-102 | 2-Apr-02 | NA | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.002 | - | ND> 0.005 | - | ND> 0.005 | - | 0.0052 | - | 0.142 | - | ND> 0.005 | - |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | 4.3 [3] | | 0.00014 [3] | | # | | 0.002 [2] | | 0.011 [2] | | # | | 0.009 [2] | | # | | 0.0025 | [2] |

Note:
# = not established
bgs = below ground surface
Diss = dissolved
EB = equipment blank
EPA = U.S. Environmental Protection Agency
mg/l = milligrams/liter
ND = not detected above detection limit indicated
ppm = parts per million

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC

**Bold** = Detected above lowest identified AWQC



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**TABLE 6**
**Summary of Preliminary Analytical Results for Groundwater Samples: Monitoring Wells**
**Metals and Cyanide**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Well Number | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Analytical Results – mg/l (ppm) | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Total Metals by EPA Methods 6010, 200.7 and/or 7000 Series | | | | | | | | | | | | | | | | EPA 9010 B | | EPA 9010 B | |
| | | | | Magnesium | Magnesium, Diss | Manganese | Manganese, Diss | Nickel | Nickel, Diss | Selenium | Selenium, Diss | Silver | Silver, Diss | Titanium | Titanium, Diss | Vanadium | Vanadium, Diss | Zinc | Zinc, Diss | Total Cyanide | | Amenable Cyanide | |
| WS-8-33 | 5237-011009-107 | 9-Oct-01 | 23-33 | 27.2 | - | 5.07 | - | 0.0039 | - | ND> 0.005 | - | ND> 0.0019 | - | 0.766 | - | 0.0397 | - | 0.0496 | - | ND> 0.02 | | ND> 0.02 | |
| | 5237-011213-105 | 13-Dec-01 | | 30. | - | 5.57 | - | ND> 0.005 | - | 0.0063 | - | ND> 0.005 | - | 0.0762 | - | 0.0059 | - | 0.0147 | - | **0.854** | | ND> 0.02 | |
| | 5237-020403-105 | 3-Apr-02 | | 21.8 | 19.9 | 4.88 | 4.51 | ND> 0.005 | ND> 0.005 | ND> 0.005 | **0.0084** | ND> 0.005 | ND> 0.005 | 0.022 | ND> 0.01 | ND> 0.005 | ND> 0.005 | 0.0243 | ND> 0.015 | **0.416** | | 0.064 | |
| | 5237-020403-106 (dup) | 3-Apr-02 | | 21.5 | - | 4.85 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | 0.013 | - | ND> 0.005 | - | ND> 0.005 | - | **0.615** | | 0.183 | |
| WS-8-59 | 5237-011008-104 | 8-Oct-01 | 49-59 | ND> 0.05 | - | 2.85 | - | ND> 0.003 | - | ND> 0.005 | - | ND> 0.0019 | - | 0.564 | - | 0.0233 | - | 0.0307 | - | **0.468** | | ND> 0.02 | |
| | 5237-011008-105 (dup) | 8-Oct-01 | | ND> 0.05 | - | 2.84 | - | ND> 0.003 | - | ND> 0.005 | - | ND> 0.0019 | - | 0.448 | - | 0.0173 | - | 0.0236 | - | **0.456** | | ND> 0.02 | |
| | 5237-011212-103 | 12-Dec-01 | | 54.7 | - | 1.83 | - | 0.0056 | - | ND> 0.005 | - | ND> 0.005 | - | 0.169 | - | 0.0084 | - | 0.0104 | - | **0.725** | | 0.263 | |
| | 5237-011212-104 (dup) | 12-Dec-01 | | 54.2 | - | 1.83 | - | 0.0055 | - | ND> 0.005 | - | ND> 0.005 | - | 0.132 | - | 0.0066 | - | 0.0094 | - | **0.066** | | ND> 0.02 | |
| | 5237-020403-104 | 3-Apr-02 | | 39.9 | - | 3.33 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | 0.0694 | - | ND> 0.005 | - | **0.0086** | - | **1.42** | | ND> 0.4 | |
| WS-9-34 | 5237-011008-102 | 8-Oct-01 | 24-34 | 53.3 | - | 4.31 | - | ND> 0.003 | - | ND> 0.005 | - | ND> 0.0019 | - | 0.0055 | - | ND> 0.001 | - | 0.0055 | - | **0.14** | | ND> 0.02 | |
| | 5237-011212-101 | 12-Dec-01 | | 60.2 | 15.6 | 7.1 | 2.24 | 0.0369 | 0.006 | ND> 0.005 | ND> 0.005 | ND> 0.005 | ND> 0.005 | 0.217 | ND> 0.001 | 0.0548 | ND> 0.005 | **0.376** | 0.0155 | **0.074** | | ND> 0.02 | |
| | 5237-020402-101 | 2-Apr-02 | | 45.5 | 22.7 | 4.35 | 2.59 | 0.0229 | 0.0087 | ND> 0.005 | **0.0054** | ND> 0.005 | ND> 0.005 | 0.254 | ND> 0.01 | 0.0482 | ND> 0.005 | **0.197** | ND> 0.015 | **0.11** | | ND> 0.04 | |
| Quality Control Samples | | | | | | | | | | | | | | | | | | | | | | | |
| Trip Blanks | 5237-011008-101 | 8-Oct-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | - | |
| | 5237-011009-106 | 9-Oct-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | - | |
| | 5237-011212-100 | 12-Dec-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | - | |
| | 5237-011213-106 | 13-Dec-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | - | |
| | 5237-020402-100 | 2-Apr-02 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | - | |
| | 5237-020403-103 | 3-Apr-02 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | - | |
| Water Eq. Blanks | 5237-011212-102 | 8-Oct-01 | NA | 0.05 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.01 | - | ND> 0.005 | - | ND> 0.01 | - | ND> 0.02 | | ND> 0.02 | |
| | 5237-011008-103 | 12-Dec-01 | NA | 0.0775 | - | ND> 0.005 | - | ND> 0.003 | - | ND> 0.005 | - | ND> 0.0019 | - | ND> 0.001 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.02 | | ND> 0.02 | |
| | 5237-020402-102 | 2-Apr-02 | NA | ND> 0.05 | - | 0.0059 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.01 | - | ND> 0.005 | - | 0.0359 | - | ND> 0.04 | | - | |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | # | # | # | # | 0.052 [2] | | 0.005 [1] | | 0.003 [3] | | # | # | # | # | 0.12 [1] | | 0.005 [2] | | | |

Note:
# = not established
bgs = below ground surface
Diss = dissolved
EB = equipment blank
EPA = U.S. Environmental Protection Agency
mg/l = milligrams/liter
ND = not detected above detection limit indicated
ppm = parts per million

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC

**Bold** = Detected above lowest identified AWQC



SCOEPA00010098

Willamette River

Former Western Transportation
Docks and Structures
(1930-1950)

SD-062 SD-063 SD-064 SD-065 SD-067 SD-068 SD-069 SD-070 SD-072 SD-075 SD-077

MW-2 MW-3 MW-4 MW-5 MW-6 MW-8 MW-9 MW-10 MW-11 MW-12 MW-13 MW-14 MW-15

P-1 P-2 P-3 P-4 P-5 P-6 P-7 P-8 P-9 P-10 P-11

WS8-59 WS8-33 WS9-34

B-1-8 B-2-8 B-3-8 B-4-8 B-5-8 B-HQ-8 B-1 B-3 B-32 B-33 B-34 B-35 B-SU-8 B-101-8 B-102-8

GP-25 GP-26 RP-01 GP-27 RP-06 GP-11

WS-1 WS-2 WS-3 W-3-81 WS-4 WS-5 WS-6 WS-7

RP-03 (abandoned) RP-03R

1981 Chromic / Nitric Acid Spill Location

1984 TCE Spill Location

1997 Caustic Solution Spill Location

WS10-30 location (approximate)

Wastewater Treatment Plant Spill Locations

NW Natural

Wacker Siltronic

Utility Easement

NW St. Helens Road

PZ-02

N

**LEGEND**

- Site Boundary
- Existing Structure or Feature
- Railroad Tracks
- Proposed Push Probe Boring Location
- Existing Monitoring Well Location
- EPA Sediment Sampe Location
- Select Boring Location (pre-2001)
- Push Probe Boring Location (HAI, 2001)
- Combined Stormwater / Process Effluent Sewer Line
- Stormwater Sewer Line
- Abandoned Utility Line
- Fire Water Line
- Olympic Petroleum Lines (2-14-inch)
- Natural Gas Line (16-inch/10-inch)

Note: Locations are approximate: Survey of 2001 sample locations not finalized

0 250 500
Approximate Scale in Feet

**Figure 1**

**Monitoring Well and Push Probe Location Map**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

**HAHN & ASSOCIATES, INC.**
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717

**May 2002**

**Project No. 5237**

SCOEPA00010099

Willamette River

River Elevation Measure Point

SD-062 SD-063 SD-064 SD-065 SD-067 SD-068 SD-069 SD-070 SD-072 SD-075 SD-077

P-1 P-2 P-3 P-4 P-5 P-6 P-7 P-8 P-9 P-10 P-11

WS8-59 WS8-33 WS9-34

MW-1 MW-2 MW-3 MW-4 MW-5 MW-6 MW-8 MW-9 MW-10 MW-11 MW-12 MW-13 MW-14 MW-15

8.52 13.99 13.50 8.16 9.12 18.85 19.51 29.66 22.45 25.23 26.21 8.33 10.11

B-1 B-1-8 B-2-8 B-3 B-3-8 B-4-8 B-5-8 B-32 B-33 B-34 B-35 B-SU-8 B-101-8 B-102-8 B-HQ-8

GP-25 GP-26 RP-01 GP-27 RP-06 GP-11

WS-1 WS-2 WS-3 WS-4 WS-5 WS-6 WS-7 W-3-81

RP-03 (abandoned) RP-03R PZ-02

1981 Chromic / Nitric Acid Spill Location

1984 TCE Spill Location

1997 Caustic Solution Spill Location

NW Natural

Wacker Siltronic

Utility Easement

NW St. Helens Road

16 12 16 12 20 16 24 24

N

**LEGEND**

- Site Boundary
- Existing Structure or Feature
- Railroad Tracks
- Existing Monitoring Well Location
- EPA Sediment Sampe Location
- Select Boring Location (pre-2001)
- Push Probe Boring Location (HAI, 2001)
- 4.58 Groundwater Elevation (feet MSL)
- Groundwater Elevation Isocontour - Contour Interval: 1.00 feet

0 250 500

Approximate Scale in Feet

**Figure 2**

**Groundwater Elevation Map - Shallow Wells (22 to 36 feet bgs)**
**April 2, 2002**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

**HAHN & ASSOCIATES, INC.**
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717

**May 2002**

**Project No. 5237**

SCOEPA00010100

Willamette River

SD-062 SD-063 SD-064 SD-065 SD-067 SD-068 SD-069 SD-070 SD-072 SD-075 SD-077

MW-2 8.63 MW-3 8.74 MW-4 8.69 MW-5 MW-8 8.52 MW-13 8.93 MW-6 NW Natural MW-10 20.87 MW-15 20.64 MW-9 MW-12

P-1 P-2 P-3 P-4 P-5 P-6 P-7 P-8 P-9 P-10 P-11 WS8-59 7.95 WS8-33 WS9-34

B-32 B-33 B-34 B-35 B-1-8 B-2-8 B-4-8 B-3-8 B-1 B-3 B-5-8 B-101-8 B-102-8 B-HQ-8 B-SU-8

1981 Chromic / Nitric Acid Spill Location
1984 TCE Spill Location
1997 Caustic Solution Spill Location

12 12 16 20

MW11 MW-14

GP-25 GP-26 RP-01 GP-27 RP-06

Wacker Siltronic

Utility Easement

WS-1 WS-2 WS-3 W-3-81 WS-4 WS-5 WS-6 WS-7 GP-11

RP-03 (abandoned) RP-03R PZ-02

NW St. Helens Road

N

LEGEND

- Site Boundary
- Existing Structure or Feature
- Railroad Tracks
- Existing Monitoring Well Location
- EPA Sediment Sampe Location
- Select Boring Location (pre-2001)
- Push Probe Boring Location (HAI, 2001)
- 4.58 Groundwater Elevation (feet MSL)
- Groundwater Elevation Isocontour - Contour Interval: 1.00 feet

0 250 500
Approximate Scale in Feet

**Figure 3**

**Groundwater Elevation Map - Intermediate Wells (50 to 61 feet bgs)**
**April 2, 2002**

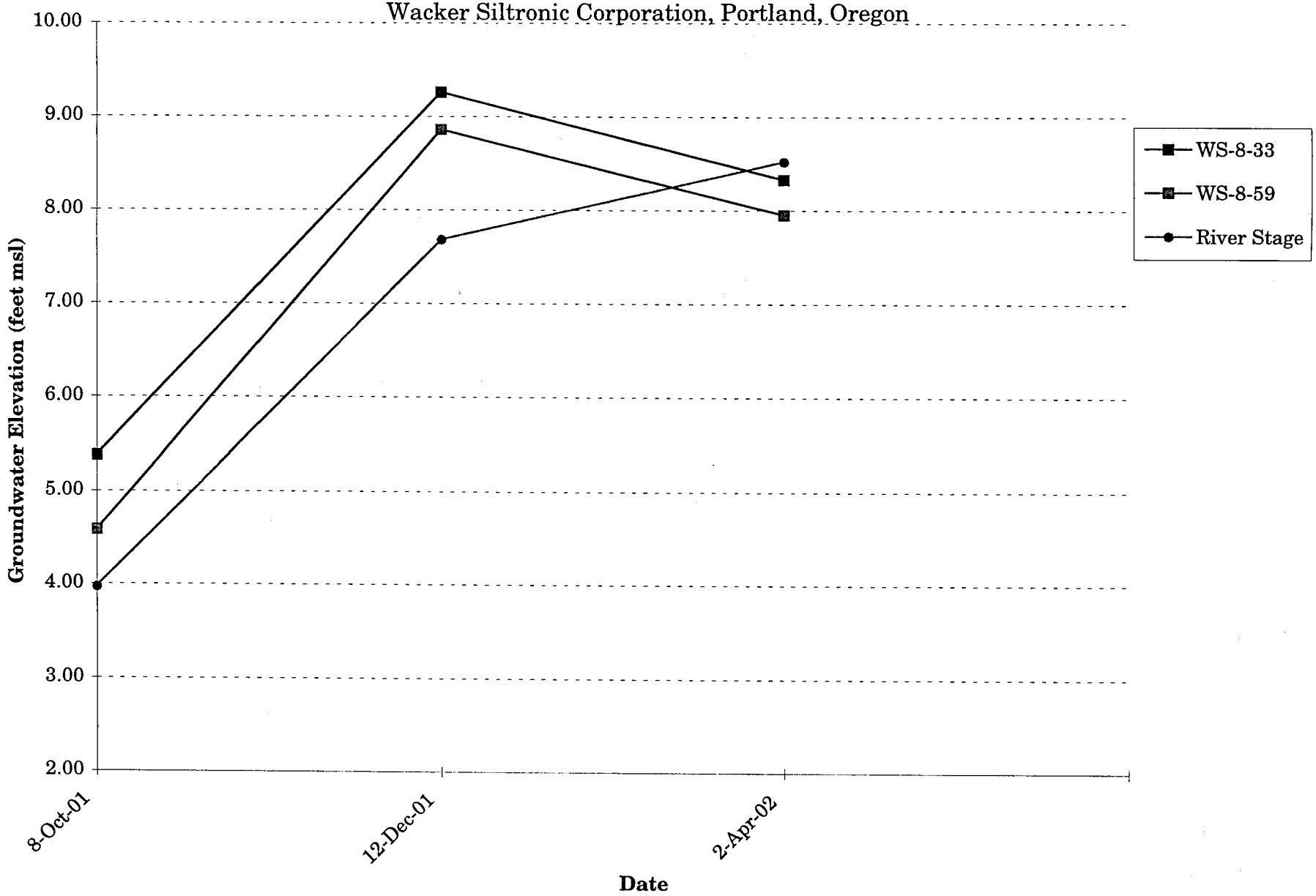
Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon


**HAHN & ASSOCIATES, INC.**
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717


**May 2002**

**Project No. 5237**

**Figure 4**
**Groundwater Hydrograph**
**WS-8 Series Monitoring Wells**
Wacker Siltronic Corporation, Portland, Oregon

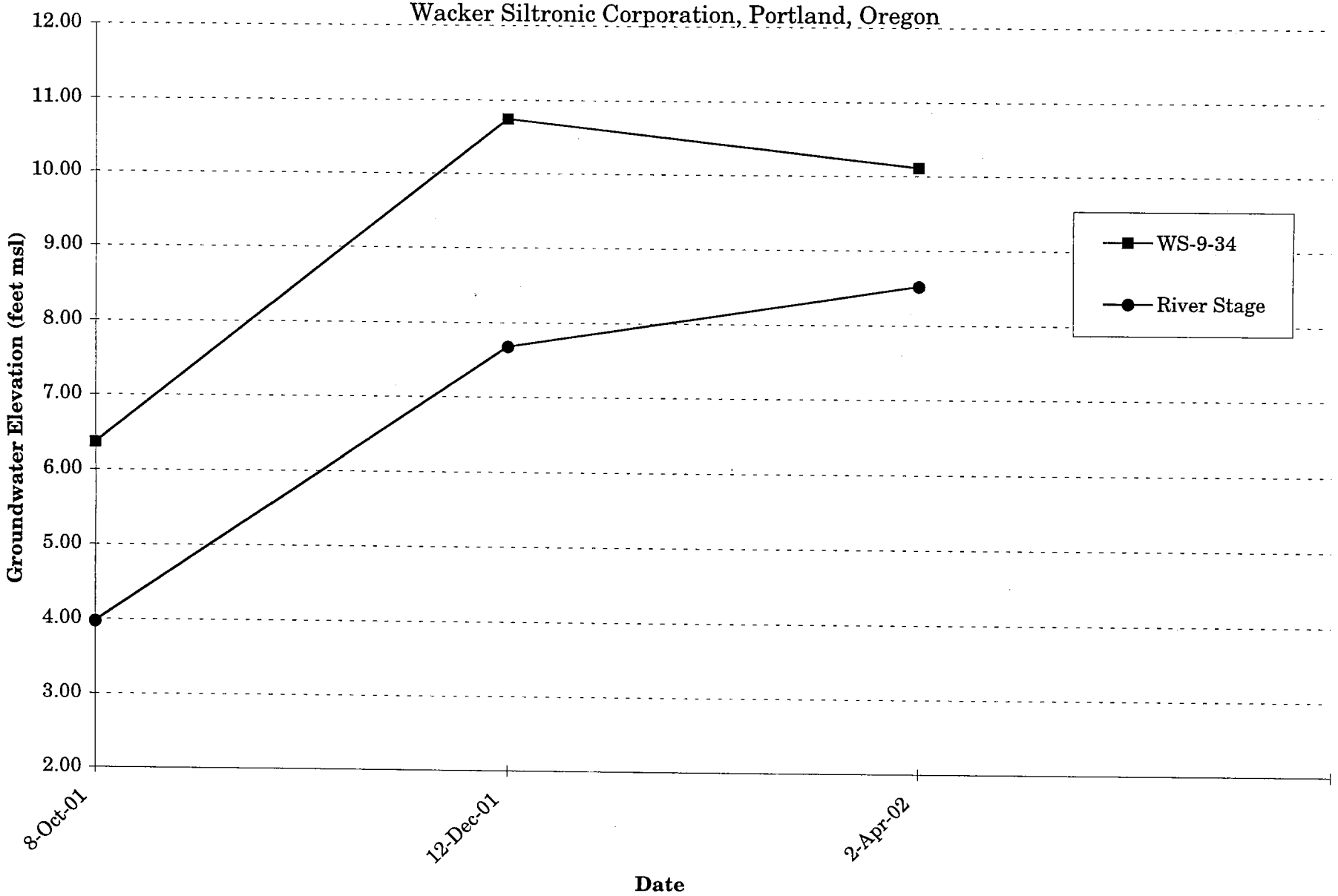



Updated: 5/13/02 RBE
File Name: 5237 GW Elevations ; Hydrograph - WS-8 Series

Project No. 5237
HAHN AND ASSOCIATES, INC.

SCOEPA00010102

**Figure 5**
**Groundwater Hydrograph**
**Well WS-9-34**
Wacker Siltronic Corporation, Portland, Oregon




Updated: 5/13/02 MSM
File Name: 5237 GW Elevations ; Hydrograph - WS-9-34

Project No. 2708
HAHN AND ASSOCIATES, INC.

SCOEPA00010103

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Chris
Tom
MFA

**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL CONSULTANTS

April 15, 2002

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland OR 97201-4987

HAI Project No. 5237

SUBJECT: March 2002 Progress Report for Remedial Investigation (RI) Activities, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. Blischke:

Hahn and Associates, Inc. (HAI) has prepared this Progress Report summarizing RI work activities that have occurred relating to the Wacker Siltronic Corporation (Wacker) property during the month of March 2002. RI field activities for the site are being conducted as per both the approved *Final Focused Remedial Investigation (RI) Work Plan*[1] (RI Work Plan), as well as the approved *Supplemental RI Work Plan* [2]. This Progress Report has been prepared as per an Order (DEQ No. ECVC-NWR-00-27) issued jointly to both NW Natural and Wacker by the Oregon Department of Environmental Quality (ODEQ), dated October 4, 2000. As per the referenced Order, monthly progress reports are to be prepared by the 15th day of each month, with the reporting to continue for the duration of the project.

**Summary of Activities in March 2002**

In correspondence dated January 7, 2002, the ODEQ provided comments resulting from review of HAI's November 20, 2001 *Data Package for Focused Remedial Investigation*. These comments identified a termination point for Phase I RI activities (completion of the off-site drainage ditch survey). The ODEQ also requested the submittal of a Work Plan addendum to address Phase II investigatory activities at the site, with a submittal date of March 8, 2002, as extended by the ODEQ in correspondence dated February 6, 2002 (Blischke to Wyatt).

Representatives of NW Natural, Wacker, and ODEQ met on March 1, 2002 to discuss the Phase II RI activities requested by the ODEQ. As agreed during the meeting, Wacker prepared a Work Plan to further investigate the migration of trichloroethene (TCE)-related impacts identified during the Phase I RI, while NW Natural prepared a Work Plan to further investigate the migration of impacts potentially attributable to former Pacific Gas & Coke operations (PG&C). Wacker's Work Plan, as well as responses to

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[1] Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1, 2001.

[2] Hahn and Associates, Inc. (2002). *Supplemental Remedial Investigation Work Plan, Wacker Siltronic Corporation,, 7200 NW Front Avenue, Portland, Oregon.* March 7, 2002.

ODEQ's comment letter, were provided to the ODEQ in correspondence dated March 6, 2002 (Futornick to Blischke). NW Natural's Work Plan, as well as responses to ODEQ's January 7, 2002 comment letter, were provided to the ODEQ in correspondence dated March 7, 2002 (Ede to Blischke).

Both the NW Natural and the Wacker Work Plan Addendums were approved for implementation by the ODEQ in correspondence dated March 15, 2002 (Eric Blischke to Bob Wyatt and Cathryn Young). Field activities associated with the Work Plan Addendums were conducted by HAI (PG&C-related) on March 18, 2002 and by Limno-Tech, Inc. (TCE-related) on March 19 through March 22, 2002.

As included within the HAI-prepared March 7, 2002 Work Plan Addendum, field activities relating to investigation of potential PG&C impacts involved the installation of one push probe boring (P-1A) for the purpose of collecting groundwater samples adjacent to the location of the formerly installed P-1 boring (Figure 1). The ODEQ had requested the collection of groundwater samples at this location to more thoroughly evaluate potential groundwater discharges to the Willamette River since a thin layer of weathered tar and associated naphthalene were identified immediately above the historical ground surface (i.e., silt unit) at this location.

As described in NW Natural's responses to ODEQ's January 7, 2002 correspondence, the semi-solid tar identified at the P-1 boring location is likely the result of historical discharges associated with the former tar ponds, and therefore is not indicative of on-going product migration to the river, nor does it alter the conceptual contaminant migration model for the site. However, groundwater sampling at the P-1 location was proposed in the Work Plan Addendum to confirm that no localized contaminant transport is occurring.

Analytical results of the groundwater samples collected from temporary well points installed in boring P-1A during the supplemental investigation are summarized on Tables 1 through 4. As indicated on these tables, one groundwater sample was collected across a depth interval of 24 to 28 feet below ground surface (bgs) within the Surficial Fill water-bearing zone (immediately above the weathered tar zone), while two groundwater samples were collected across a depth interval of 54 to 58 feet bgs within the Alluvial Sand WBZ. A boring log that describes hydrogeological conditions encountered at the P-1A location, as well as results of contaminant field screening, is attached.

As summarized on Tables 1 and 2, and as depicted on the cross-section presented in Figure 2, analyses of groundwater samples from both the Surficial Fill and the Alluvial Sand water-bearing zones (WBZs) at the P-1A location did not identify the presence of benzene (or carcinogenic PAHs) at concentrations greater than analytical method detection limits. Further, with the exception of cyanide and zinc, all other analyzed constituents were either non-detect or were reported at concentrations below levels established for the protection of surface water-related aquatic life and human health through the Ambient Water Quality Criteria (AWQC). Cyanide and zinc detections at P-1A, although greater than the AWQC, were consistent with detections at other locations, and as such, the detection of cyanide in groundwater at P-1A is not indicative of a preferential zone of migration. Although not relevant to groundwater, we have used the AWQC as a very conservative screen with



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regard to the potential for groundwater discharge to impact surface water, assuming zero dilution in the receiving surface water body.

Based on results of the P-1A investigatory activities described above, further supplemental investigation associated with potential PG&C-related impacts is not warranted at this time. A full reporting and evaluation of the results of NW Natural's investigatory activities will be included within the Phase I Site Characterization Summary Report and the Technical Memorandum on Source Control Measures, both of which are due to the ODEQ within 90 days after completion of the Phase I RI activities. NW Natural understands that results of Wacker's TCE-related investigation activities will be documented by Wacker to be submitted independently by them to the ODEQ.

Additional activities completed during March 2002 included submittal of NW Natural's responses (Ede to Blischke, 3/21/02) to ODEQ comments provided within their March 15, 2002 approval of the RI Work Plan Addendums. Finally, in correspondence dated March 28, 2002 (Blischke to Wyatt and Young), the ODEQ requested that water level monitoring activities be conducted by either NW Natural (assuming access is provided) or by Wacker at Wacker-owned monitoring wells WS-1 through WS-5, and WS-10 during the planned April 2, 2002 area-wide sampling event.

**Anticipated / Completed Activities in April and May 2002**

The third quarterly groundwater monitoring event associated with the three monitoring wells installed in September 2001 at the Wacker property (WS-8-33, WS-8-59, and WS-9-34) was initiated by HAI on April 2, 2002. These sampling activities were conducted synchronously with sampling activities conducted at the adjacent NW Natural property, and were coordinated with area-wide water level monitoring activities conducted by others at nearby Rhone-Poulenc / Aventis and Atofina wells and within Wacker wells that pre-date initiation of source control investigation activities (i.e., wells WS-1 through WS-5, and WS-10). Further, as requested by the ODEQ in correspondence dated March 28, 2002 (Blischke to Wyatt and Young), to assist Wacker in their TCE investigation, groundwater samples collected from select wells at the adjacent NW Natural – Gasco site during April 2002 will include analysis for TCE and it's primary degradation products.

Remaining Phase I RI data collection tasks to be completed at the site include: 1) completion of a continuous short-term (48 hours) groundwater elevation monitoring event; 2) an inspection and survey of the base of the drainage ditch located immediately west and south of the Wacker property; and 3) the final groundwater sampling event in late June 2002. Task 1, which still needs DEQ approval, will be scheduled for completion prior to the final (June 2002) groundwater sampling event, while Task 2 will require receipt of access approval from the Burlington Northern Santa Fe Railroad Company (BNSF), the owner of the right-of-way through which the ditch runs.

Access to the BNSF property was officially requested in correspondence dated November 16, 2001. In early April 2002, the request was modified to reduce the area requiring access (i.e., no access to Rhone-Poulenc / Aventis wells) in an effort to simplify BNSF's access approval process. At this time, no Access Agreement has yet been proposed by BNSF's



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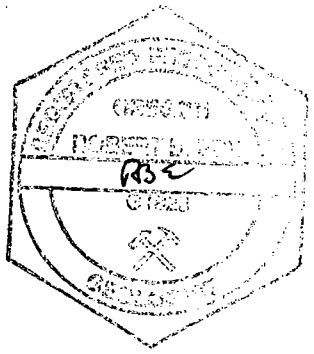
representatives (The Staubach Company, Inc.). Due to continued difficulties in gaining off-site access for completion of the remaining Phase I RI task (off-site ditch survey), a second 45-day extension to the February 22, 2002 field work completion deadline is requested, with a new completion date to be established as May 23, 2002. Task 2 will be scheduled for completion as soon as possible after receipt of approved access from BNSF.

Should you have any questions, please contact the undersigned.

Sincerely,

Robert Ede, R.G.
Associate



c: Mr. Bob Wyatt, NW Natural
Ms. Patty Dost, Schwabe, Williamson & Wyatt
Mr. Carl Stivers, Anchor Environmental, L.L.C.
Ms. Cathryn Young, Wacker Siltronic Corporation



SCOEPA00010108

(30)

**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL CONSULTANTS

March 14, 2002

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland OR 97201-4987

HAI Project No. 5237

SUBJECT: February 2002 Progress Report for Remedial Investigation (RI) Activities, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. Blischke:

Hahn and Associates, Inc. (HAI) has prepared this Progress Report summarizing RI work activities that have occurred relating to the Wacker Siltronic Corporation (Wacker) property during the month of February 2002. RI field activities are being conducted as per the approved *Final Focused Remedial Investigation (RI) Work Plan*[1] (RI Work Plan) prepared for the site. This Progress Report has been prepared as per an Order (DEQ No. ECVC-NWR-00-27) issued jointly to both NW Natural and Wacker by the Oregon Department of Environmental Quality (ODEQ), dated October 4, 2000. As per the referenced Order, monthly progress reports are to be prepared by the 15th day of each month, with the reporting to continue for the duration of the project.

As required by the ODEQ Order, as modified by extensions granted within correspondence dated October 23, 2001 and December 21, 2001 (Mr. Eric Blischke to Mr. Bob Wyatt), Phase I RI site characterization activities are to be completed 240 days from receipt of Work Plan approval. With approval of the RI Work Plan by the ODEQ on June 26, 2001, this equated to an original Phase I field work completion date of February 22, 2002.

**Summary of Activities in February 2002**

In correspondence dated January 7, 2002, the ODEQ provided comments resulting from review of HAI's November 20, 2001 *Data Package for Focused Remedial Investigation*. These comments identified a termination point for Phase I RI activities (completion of the off-site drainage ditch survey). ODEQ also requested the submittal of a Work Plan addendum to address Phase II investigatory activities at the site on or before February 6, 2002.

Due to continued difficulties in gaining off-site access for completion of the remaining Phase I RI task (off-site ditch survey), in correspondence dated February 15, 2002, (Ede to Blischke), a 45-day extension to the February 22, 2002 field work completion deadline was requested, with a new completion date established as April 8, 2002.

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[1] Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1, 2001.

In correspondence dated February 6, 2002 (Blischke to Wyatt), the ODEQ granted a 30-day extension for responding to the ODEQ's January 7, 2002 request for Work Plan Addendum submittal. With the extension, the revised date for Work Plan Addendum submittal to the ODEQ is March 8, 2002. The Work Plan Addendum was submitted to the ODEQ on March 7, 2002.

In correspondence dated February 15, 2002 (Ede to Blischke), a Supplemental Work Plan to address remaining groundwater monitoring activities at Wacker, including the implementation of a short-term continuous water level monitoring event, was provided to the ODEQ for review as specified under Section 9.2.5 of the RI Work Plan. With regard to this Work Plan, and as was discussed during a recent telephone conversation, we have determined that collection of water level data at the Rhone-Poulenc/Aventis wells would result in generation of waste water that may contain a hazardous waste or contain a hazardous substance not attributable to any activity by NW Natural / Gasco. We understand that DEQ concurs that the water level data collection activities related to these wells, although included within the February 15, 2002 Supplemental Work Plan, need not be performed. NW Natural is presently awaiting ODEQ approval of the Supplemental Work Plan prior to implementation.

On February 20, 2002, HAI completed slug testing activities on newly-installed wells WS-8-33, WS-8-59, and WS-9-34 at the Wacker property. Slug tests were conducted as specified within Section 9.2.6 of the RI Work Plan. Results of the slug testing activities will be included within the Phase I Site Characterization Summary Report, due to the ODEQ within 90 days after completion of the Phase I RI activities.

**Anticipated Activities in March and April 2002**

Representatives of NW Natural, Wacker, and ODEQ met on March 1, 2002 to discuss Phase II RI activities requested by the ODEQ in correspondence dated January 7, 2002. As agreed during the meeting, Wacker would prepare a Work Plan to further investigate the migration of trichloroethene (TCE)-related impacts identified during the Phase I RI, while NW Natural would prepare a Work Plan to further investigate the migration of impacts potentially attributable to former Pacific Gas & Coke operations. NW Natural's Work Plan, along with a detailed response to ODEQ's January 7, 2002 comment letter, was provided to the ODEQ in correspondence dated March 7, 2002 (Ede to Blischke).

Assuming approval of NW Natural's March 7, 2002 Work Plan is received from the ODEQ with sufficient lead time, then the proposed activities are scheduled to commence on March 18, 2002, with the field work anticipated to require one day to complete.

Remaining Phase I RI tasks to be completed at the site include: 1) completion of a continuous short-term (48 hours) groundwater elevation monitoring event; and 2) an inspection and survey of the base of the drainage ditch located immediately west and south of the Wacker property. Task 1 will be scheduled for completion once ODEQ approval of the February 15, 2002 Supplemental Work Plan is received, while Tasks 2 will require receipt of access approval from the BNSF, the owner of the right-of-way through which the ditch



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runs. Access to the BNSF property was officially requested in correspondence dated November 16, 2001. BNSF has not yet granted NW Natural access to their property. Task 2 will be scheduled for completion as soon as possible after receipt of approved access from BNSF.

Should you have any questions, please contact the undersigned.

Sincerely,

Robert Ede, R.G.
Associate

c: Mr. Bob Wyatt, NW Natural
Ms. Patty Dost, Schwabe, Williamson & Wyatt
Mr. Carl Stivers, Anchor Environmental, L.L.C.
Ms. Cathryn Young, Wacker Siltronic Corporation



SCOEPA00010112

(31)

**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL CONSULTANTS

February 15, 2002

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland OR 97201-4987

HAI Project No. 5237

SUBJECT: January 2002 Progress Report for Remedial Investigation (RI) Activities, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. Blischke:

Hahn and Associates, Inc. (HAI) has prepared this Progress Report summarizing RI work activities that have occurred relating to the Wacker Siltronic Corporation (Wacker) property during the month of January 2002. RI field activities are being conducted as per the approved *Final Focused Remedial Investigation (RI) Work Plan*[1] (RI Work Plan) prepared for the site. This Progress Report has been prepared as per an Order (DEQ No. ECVC-NWR-00-27) issued jointly to both NW Natural and Wacker by the Oregon Department of Environmental Quality (ODEQ), dated October 4, 2000.

As per the referenced Order, monthly progress reports are to be prepared by the 15th day of each month, with the reporting to continue for the duration of the project.

**Summary of Activities in January 2002**

As previously reported, the second quarterly groundwater monitoring event associated with the three monitoring wells installed in September 2001 at the Wacker property (WS-8-33, WS-8-59, and WS-9-34) was conducted by HAI on December 12 and 13, 2001. Final laboratory reports documenting analytical results of the groundwater samples collected from the indicated wells were received by HAI in January 2002. A summary of the results of the December 2001 analyses, as well as results from the previous sampling event (October 2001), is provided on Tables 1 through 4. As indicated on the referenced Tables, few compounds were identified in groundwater at concentrations exceeding conservative screening levels (Ambient Water Quality Criteria).

In correspondence dated January 7, 2002, the ODEQ provided comments resulting from review of HAI's November 20, 2001 *Data Package for Focused Remedial Investigation*. These comments identified a termination point for Phase I RI activities (completion of the off-site drainage ditch survey). ODEQ also requested the submittal of a Work Plan addendum to address Phase II investigatory activities at the site.

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[1] Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1, 2001.

**Anticipated Activities in February and March 2002**

In correspondence dated February 6, 2002 (Blischke to Wyatt), the ODEQ granted a 30-day extension for responding to the ODEQ's January 7, 2002 request for Work Plan Addendum submittal. With the extension, the revised date for Work Plan Addendum submittal to the ODEQ is March 8, 2002.

As required by ODEQ Order No. ECVC-NWR-00-27, as modified by the extensions granted within correspondence dated October 23, 2001 and December 21, 2001 (Mr. Eric Blischke to Mr. Bob Wyatt), site characterization activities are to be completed 240 days from receipt of Work Plan approval. With approval of the RI Work Plan by the ODEQ on June 26, 2001, this equates to a Phase I field work completion date of February 22, 2002.

Remaining Phase I RI tasks to be completed at the site include: 1) completion of aquifer slug tests on select newly installed monitoring wells; 2) development and implementation of a plan for conducting a continuous short-term (48 hours) groundwater elevation monitoring event; and 3) an inspection and survey of the base of the drainage ditch located immediately west and south of the Wacker property. Tasks 1 and 2 are scheduled for completion in mid-February 2002.

Tasks 3 will require receipt of access approval from the Burlington Northern and Santa Fe Railroad Company (BNSF), the owner of the right-of-way through which the ditch runs. Access to the BNSF property was officially requested in correspondence dated November 16, 2001. BNSF has not yet granted NW Natural access to their property.

Because access to the BNSF property has not yet been granted, it does not appear probable that Task 3 will be completed by the scheduled Phase I RI completion date of February 22, 2002. As such, a 45-day extension to the scheduled completion date is requested to allow sufficient time to receive access from BNSF and to complete the survey work.

Should you have any questions, please contact the undersigned.

Sincerely,

Robert Ede, R.G.
Associate

c: Mr. Bob Wyatt, NW Natural
Ms. Patty Dost, Schwabe, Williamson & Wyatt
Mr. Carl Stivers, Anchor Environmental, L.L.C.
Ms. Cathryn Young, Wacker Siltronic Corporation



SCOEPA00010115

**TABLE 1**
**Summary of Analytical Results for Groundwater Samples: Monitoring Wells**
**Detected Volatile Organic Compounds by EPA Method 8260**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Well Number | HAI Sample Number | Sample Date | Screen Interval | Analytical Results – ug/l (ppb) VOCs by EPA Method 8260 | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Aromatic VOCs (AVOCs) | | | | | Halogenated VOCs (HVOCs) | | | | | | | |
| | | | (feet bgs) | Benzene | Ethylbenzene | Toluene | Xylene | Naphthalene | 1,1-DCE | cis-1,2-DCE | trans-1,2-DCE | TCE | Vinyl Chloride | Other VOCs | Total AVOCs | Total HVOCs |
| WS-8-33 | 5237-011009-107 | 9-Oct-01 | 23-33 | **107.** | 27.9 | ND> 10. | ND> 20. | **841.** | ND> 10. | ND> 10. | ND> 10. | ND> 10. | ND> 12. | 1,2,4-TMB = 18.8 | 994.7 | ND |
| | 5237-011213-105 | 13-Dec-01 | | 68. | 29.6 | ND> 5. | 23.2 | 455. | ND> 5. | ND> 5. | ND> 5. | ND> 5. | ND> 6. | 1,2,4-TMB = 23.1 | 598.9 | ND |
| WS-8-59 | 5237-011008-104 | 8-Oct-01 | 49-59 | 14.7 | ND> 1. | ND> 1. | ND> 2. | 38.9 | ND> 1. | 251. | ND> 1. | ND> 1. | 92.4 | ND | 53.6 | 343.4 |
| (duplicate) | 5237-011008-105 | | | 21.4 | ND> 1. | 2.02 | ND> 2. | 49.9 | ND> 1. | 345. | ND> 1. | ND> 1. | 129. | ND | 73.3 | 474. |
| | 5237-011212-103 | 12-Dec-01 | | 26.8 | ND> 1. | 1.27 | 2.66 | 13.9 | ND> 1.5 | 409. | 2.2 | 3.53 | 332. | ND | 44.6 | 746.7 |
| (duplicate) | 5237-011212-104 | | | 27. | ND> 1. | 1.32 | 2.57 | 12.4 | 1.03 | 398. | 2.15 | 3.39 | 306. | ND | 43.3 | 710.6 |
| WS-9-34 | 5237-011008-102 | 8-Oct-01 | 24-34 | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 5. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| | 5237-011212-101 | 12-Dec-01 | | ND> 1. | ND> 1. | ND> 1. | ND> 2. | 2.04 | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | 2. | ND |
| Quality Control Samples | | | | | | | | | | | | | | | | |
| Trip Blanks | 5237-011008-101 | 8-Oct-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 5. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| | 5237-011212-100 | 12-Dec-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| | 5237-011213-106 | 13-Dec-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| | 5237-011009-106 | 9-Oct-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| Water EB | 5237-011008-103 | 8-Oct-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 5. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | acetone = 149.0 | ND | ND |
| | 5237-011212-102 | 12-Dec-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | acetone = 54.7 | ND | ND |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | 71. [3] | 29,000. [3] | 200,000. [3] | # | 620. [4] | # | 11,600. [4] | 140,000. [3] | 81. [3] | 525. [3] | # | # | # |

Note:
# = not established
AVOCs = aromatic volatile organic compounds
bgs = below ground surface
DCB = dichlorobenzene
DCE = dichloroethene
EB = equipment bl anks
EPA = U.S. Environmental Protectior ppb = parts per billion
HVOCs = halogenated volatile organi TCE = trichloroethene
ND = not detected above detection limit indicated
ug/l = micrograms/liter
VOCs = volatile organic compounds
HAI = Hahn and Associates, Inc.

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Human Fish Consumption Criteria of AWQC
3 = Reference Level based on Lowest Observable Health Effect Level for Freshwater, as provided within NOAA Screening Quick Reference Tables, updated September 1999
**Bold** = Detected above lowest identified AWQC



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**TABLE 2**
**Summary of Analytical Results for Groundwater Samples: Monitoring Wells**
**Polynuclear Aromatic Hydrocarbons by EPA Method 8270 SIM**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| PAHs by EPA Method 8270 (SIM) | | | | Analytical Results ug/l (ppb) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Carcinogenic PAHs | | | | | | | Non-carcinogenic PAHs | | | | | | | | | | |
| Well Number | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Benzo (a) anthracene | Benzo (b) fluoranthene | Benzo (k) fluoranthene | Benzo (a) pyrene | Chrysene | Dibenzo (a,h) anthracene | Indeno (1,2,3-cd) pyrene | Acenaphthene | Acenaphthylene | Anthracene | Benzo (g,h,i) perylene | Fluoranthene | Fluorene | Naphthalene | Phenanthrene | Pyrene | Total PAHs |
| WS-8-33 | 5237-011009-107 | 9-Oct-01 | 23-33 | **0.55** | **0.19** | ND> 0.1 | **0.27** | **0.6** | ND> 0.1 | **0.11** | 98.7 | 1.17 | 8.42 | 0.15 | 7.83 | 32.5 | 485. | 85. | 7.65 | 728.1 |
| | 5237-011213-105 | 13-Dec-01 | | **0.25** | **0.1** | ND> 0.1 | **0.27** | **0.3** | ND> 0.1 | **0.11** | 105. | 2.35 | 11.9 | ND> 0.1 | 7.35 | 31.9 | 287. | 70.5 | 7.15 | 524.2 |
| WS-8-59 | 5237-011008-104 | 8-Oct-01 | 49-59 | **0.25** | ND> 0.1 | ND> 0.1 | ND> 0.1 | **0.29** | ND> 0.1 | ND> 0.1 | 18.5 | 0.38 | 4.2 | ND> 0.1 | 5.8 | 7.9 | 22.7 | 31.8 | 6.4 | 98.2 |
| (duplicate) | 5237-011008-105 | | | **0.2** | ND> 0.1 | ND> 0.1 | ND> 0.1 | **0.24** | ND> 0.1 | ND> 0.1 | 18.9 | 0.39 | 4.1 | ND> 0.1 | 5.5 | 7.9 | 22.5 | 29.8 | 6.3 | 95.8 |
| | 5237-011212-103 | 12-Dec-01 | | **0.32** | **0.1** | **0.1** | **0.14** | **0.41** | ND> 0.1 | ND> 0.1 | 12.9 | 0.24 | 2.97 | 0.1 | 4.72 | 4.77 | 10.5 | 22.8 | 5.07 | 65.1 |
| (duplicate) | 5237-011212-104 | | | **0.23** | ND> 0.1 | ND> 0.1 | ND> 0.1 | **0.29** | ND> 0.1 | ND> 0.1 | 12.6 | 0.23 | 2.94 | ND> 0.1 | 4.46 | 5.13 | 10.8 | 21.8 | 4.49 | 63. |
| WS-9-34 | 5237-011008-102 | 8-Oct-01 | 24-34 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | 2.07 | 0.15 | ND> 0.1 | ND> 0.1 | 0.36 | 0.18 | 0.45 | ND> 0.1 | 0.38 | 3.6 |
| | 5237-011212-101 | 12-Dec-01 | | **0.11** | **0.1** | **0.1** | **0.15** | **0.17** | ND> 0.1 | **0.12** | 17.8 | 0.33 | 0.33 | 0.17 | 1.91 | 6.43 | 0.4 | 2.45 | 1.74 | 32.3 |
| Quality Control Samples | | | | | | | | | | | | | | | | | | | | | |
| Trip Blanks | 5237-011008-101 | 8-Oct-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND |
| | 5237-011212-100 | 12-Dec-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND |
| | 5237-011213-106 | 13-Dec-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND |
| | 5237-011009-106 | 9-Oct-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND |
| Water EB | 5237-011008-103 | 8-Oct-01 | NA | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND |
| | 5237-011212-102 | 12-Dec-01 | NA | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | 0.049 [3] | 0.049 [3] | 0.049 [3] | 0.049 [3] | 0.049 [3] | 0.049 [3] | 0.049 [3] | 2,700. [2] | # | 110,000. [3] | # | 370 [3] | 14,000. [3] | 620. [4] | # | 11,000. [3] | # | |

Note:
# = not established
bgs = below ground surface
EB = equipment blanks
EPA = U.S. Environmental Protection Agency
ND = not detected above detection limit indicated
PAHs = polynuclear aromatic hydrocarbons
ppb = parts per billion
ug/l = micrograms per liter

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC
4 = Reference Level based on Lowest Observable Health Effect Level for Freshwater, as provided within NOAA Screening Quick Reference Tables, updated September 1999
**Bold** = Detected above lowest identified AWQC



SCOEPA00010117

**TABLE 3**
**Summary of Analytical Results for Groundwater Samples: Monitoring Wells**
**Detected Semi-Volatile Organic Compounds by EPA Method 8270C**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| SVOCs by EPA Method 8270 | | | | Analytical Results ug/l (ppb) | | | |
|---|---|---|---|---|---|---|---|
| Well Number | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Carbazole | Dibenzofuran | 2-Methylnaphthalene | PAHs |
| WS-8-33 | 5237-011009-107 | 9-Oct-01 | 23-33 | 14.7 | 4.26 | 59.2 | See Table 2 |
| | 5237-011213-105 | 13-Dec-01 | | 45.2 | 3.97 | 65.8 | See Table 2 |
| WS-8-59 | 5237-011008-104 | 8-Oct-01 | 49-59 | ND> 4. | ND> 2. | 6.74 | See Table 2 |
| (duplicate) | 5237-011008-105 | | | ND> 4. | ND> 2. | 7.17 | See Table 2 |
| | 5237-011212-103 | 12-Dec-01 | | ND> 4. | ND> 2. | ND> 2. | See Table 2 |
| (duplicate) | 5237-011212-104 | | | ND> 4. | ND> 2. | ND> 2. | See Table 2 |
| WS-9-34 | 5237-011008-102 | 8-Oct-01 | 24-34 | ND> 4. | ND> 2. | ND> 2. | See Table 2 |
| | 5237-011212-101 | 12-Dec-01 | | ND> 4. | ND> 2. | ND> 2. | See Table 2 |
| Quality Control Samples | | | | | | | |
| Trip Blanks | 5237-011008-101 | 8-Oct-01 | NA | - | - | - | See Table 2 |
| | 5237-011212-100 | 12-Dec-01 | NA | - | - | - | See Table 2 |
| | 5237-011009-106 | 9-Oct-01 | NA | - | - | - | See Table 2 |
| | 5237-011213-106 | 13-Dec-01 | NA | - | - | - | See Table 2 |
| Water EB | 5237-011008-103 | 8-Oct-01 | NA | ND> 4. | ND> 2. | ND> 2. | See Table 2 |
| | 5237-011212-102 | 12-Dec-01 | NA | ND> 4. | ND> 2. | ND> 2. | See Table 2 |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | # | # | # | # |

Note:

bgs = below ground surface
EB = equipment blanks
EPA = U.S. Environmental Protection Agency
ND = Not detected above detection limit indicated

PAHs = polynuclear aromatic hydrocarbons
ppb = parts per billion
ug/l = micrograms/liter
# = not established

1 = Ambient Water Quality Criteria (EPA 822-Z-99-001)



SCOEPA00010118

**TABLE 4**
**Summary of Analytical Results for Groundwater Samples: Monitoring Wells**
**Metals and Cyanide**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Well Number | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Analytical Results – mg/l (ppm) Total Metals by EPA Methods 6010, 200.7 and/or 7000 Series | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Antimony | Antimony, Diss | Arsenic | Arsenic, Diss | Barium | Barium, Diss | Cadmium | Cadmium, Diss | Chromium | Chromium, Diss | Cobalt | Cobalt, Diss | Copper | Copper, Diss | Iron | Iron, Diss | Lead | Lead, Diss |
| WS-8-33 | 5237-011009-107 | 9-Oct-01 | 23-33 | ND> 0.003 | - | **0.0063** | - | 0.184 | - | ND> 0.001 | - | 0.0069 | - | 0.0041 | - | **0.0264** | - | 117. | - | **0.0082** | - |
| | 5237-011213-105 | 13-Dec-01 | | ND> 0.005 | - | **0.0162** | - | 0.142 | - | ND> 0.002 | - | 0.005 | - | 0.005 | - | 0.005 | - | 76.6 | - | ND> 0.005 | - |
| WS-8-59 | 5237-011008-104 | 8-Oct-01 | 49-59 | ND> 0.003 | - | ND> 0.005 | - | 0.153 | - | ND> 0.001 | - | ND> 0.005 | - | ND> 0.001 | - | 0.0055 | - | 49.6 | - | ND> 0.005 | - |
| (duplicate) | 5237-011008-105 | | | ND> 0.003 | - | ND> 0.005 | - | 0.142 | - | ND> 0.001 | - | ND> 0.005 | - | ND> 0.001 | - | 0.0037 | - | 47. | - | ND> 0.005 | - |
| | 5237-011212-103 | 12-Dec-01 | | ND> 0.005 | - | ND> 0.005 | - | 0.123 | - | ND> 0.002 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | 48.1 | - | ND> 0.005 | - |
| (duplicate) | 5237-011212-104 | | | ND> 0.005 | - | ND> 0.005 | - | 0.119 | - | ND> 0.002 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | 47.2 | - | ND> 0.005 | - |
| WS-9-34 | 5237-011008-102 | 8-Oct-01 | 24-34 | ND> 0.003 | - | ND> 0.005 | - | 0.246 | - | ND> 0.001 | - | ND> 0.005 | - | 0.0281 | - | 0.0074 | - | 33.9 | - | ND> 0.005 | - |
| | 5237-011212-101 | 12-Dec-01 | | 0.0067 | 0.0108 | **0.0607** | ND> 0.005 | 0.923 | 0.0348 | ND> 0.002 | ND> 0.002 | **0.0207** | ND> 0.005 | 0.0437 | 0.0112 | **0.0431** | ND> 0.005 | 188. | 88. | **0.197** | ND> 0.005 |
| Quality Control Samples | | | | | | | | | | | | | | | | | | | | | |
| Trip Blanks | 5237-011008-101 | 8-Oct-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-011009-106 | 9-Oct-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-011212-100 | 12-Dec-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-011213-106 | 13-Dec-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Water EB | 5237-011212-102 | 12-Dec-01 | NA | ND> 0.003 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.002 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | 0.0222 | - | ND> 0.005 | - |
| | 5237-011008-103 | 8-Oct-01 | NA | ND> 0.003 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.001 | - | ND> 0.005 | - | ND> 0.001 | - | ND> 0.001 | - | 0.0417 | - | ND> 0.005 | - |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | 4.3 [3] | | 0.00014 [2] | | # | | 0.002 [2] | | 0.011 [2] | | # | | 0.009 [3] | | # | | 0.003 | [2] |

Note:
# = not established
bgs = below ground surface
Diss = dissolved
EB = equipment blank
EPA = U.S. Environmental Protection Agency
mg/l = milligrams/liter
ND = not detected above detection limit indicated
ppm = parts per million

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC

**Bold** = Detected above lowest identified AWQC



SCOEPA00010119

**TABLE 4**
**Summary of Preliminary Analytical Results for Groundwater Samples: Monitoring Wells**
**Metals and Cyanide**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Well Number | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Analytical Results – mg/l (ppm) | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Total Metals by EPA Methods 6010, 200.7 and/or 7000 Series | | | | | | | | | | | | | | | | | | EPA 9010 B | EPA 9010 B |
| | | | | Magnesium | Magnesium, Diss | Manganese | Manganese, Diss | Nickel | Nickel, Diss | Selenium | Selenium, Diss | Silver | Silver, Diss | Titanium | Titanium, Diss | Vanadium | Vanadium, Diss | Zinc | Zinc, Diss | Total Cyanide | Amenable Cyanide |
| WS-8-33 | 5237-011009-107 | 9-Oct-01 | 23-33 | 27.2 | - | 5.07 | - | 0.0039 | - | ND> 0.005 | - | ND> 0.0019 | - | 0.766 | - | 0.0397 | - | 0.0496 | - | ND> 0.02 | ND> 0.02 |
| | 5237-011213-105 | 13-Dec-01 | | 30. | - | 5.57 | - | ND> 0.005 | - | 0.0063 | - | ND> 0.005 | - | 0.0762 | - | 0.0059 | - | 0.0147 | - | **0.854** | ND> 0.02 |
| WS-8-59 | 5237-011008-104 | 8-Oct-01 | 49-59 | ND> 0.05 | - | 2.85 | - | ND> 0.003 | - | ND> 0.005 | - | ND> 0.0019 | - | 0.564 | - | 0.0233 | - | 0.0307 | - | **0.468** | ND> 0.02 |
| (duplicate) | 5237-011008-105 | | | ND> 0.05 | - | 2.84 | - | ND> 0.003 | - | ND> 0.005 | - | ND> 0.0019 | - | 0.448 | - | 0.0173 | - | 0.0236 | - | **0.456** | ND> 0.02 |
| | 5237-011212-103 | 12-Dec-01 | | 54.7 | - | 1.83 | - | 0.0056 | - | ND> 0.005 | - | ND> 0.005 | - | 0.169 | - | 0.0084 | - | 0.0104 | - | **0.725** | 0.263 |
| (duplicate) | 5237-011212-104 | | | 54.2 | - | 1.83 | - | 0.0055 | - | ND> 0.005 | - | ND> 0.005 | - | 0.132 | - | 0.0066 | - | 0.0094 | - | **0.066** | ND> 0.02 |
| WS-9-34 | 5237-011008-102 | 8-Oct-01 | 24-34 | 53.3 | - | 4.31 | - | ND> 0.003 | - | ND> 0.005 | - | ND> 0.0019 | - | 0.0055 | - | ND> 0.001 | - | 0.0055 | - | **0.14** | ND> 0.02 |
| | 5237-011212-101 | 12-Dec-01 | | 60.2 | 15.6 | 7.1 | 2.24 | 0.0369 | 0.006 | ND> 0.005 | ND> 0.005 | ND> 0.005 | ND> 0.005 | 0.217 | ND> 0.001 | 0.0548 | ND> 0.005 | **0.376** | 0.0155 | **0.074** | ND> 0.02 |
| Quality Control Samples | | | | | | | | | | | | | | | | | | | | | |
| Trip Blanks | 5237-011008-101 | 8-Oct-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-011009-106 | 9-Oct-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-011212-100 | 12-Dec-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5237-011213-106 | 13-Dec-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Water Eq. Blanks | 5237-011212-102 | 8-Oct-01 | NA | 0.05 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.01 | - | ND> 0.005 | - | ND> 0.01 | - | ND> 0.02 | ND> 0.02 |
| | 5237-011008-103 | 12-Dec-01 | NA | 0.0775 | - | ND> 0.005 | - | ND> 0.003 | - | ND> 0.005 | - | ND> 0.0019 | - | ND> 0.001 | - | ND> 0.005 | - | ND> 0.005 | - | ND> 0.02 | ND> 0.02 |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | # | # | # | # | 0.052 [2] | | 0.005 [2] | | 0.003 [2] | | # | # | # | # | 0.12 [2] | | 0.005 [2] | |

Note:
# = not established
bgs = below ground surface
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EPA = U.S. Environmental Protection Agency
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ND = not detected above detection limit indicated
ppm = parts per million

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC

**Bold** = Detected above lowest identified AWQC



SCOEPA00010120

Return to: Cathryn Young
Central Engineering, MS 30
Wacker Siltronic Corp.
7200 NW Front Avenue
Portland, OR 97210-3676

## STATE OF OREGON WELL OWNERSHIP INFORMATION FORM
## (FILE WITH COUNTY CLERK'S OFFICE)

Pursuant to ORS 537.788, owners of property on which a well is located shall, within 60 days following the construction and/or alteration of a new well or upon property transfer, **record the following information in the property deed records at the appropriate County Clerks Office**. Either the deed recording number or legal description of the property may be used to identify the property.

**Property Owner Name(s):** Wacker Siltronic Corporation

**Mailing Address:** 7200 NW Front Avenue, Portland, OR 97210-3676

**Deed Recording Number (or legal description):** 13 - 1N - 1W Tax Lot: 1200, Book 1404, Page 2180

**Well Identification Number(s):** L52677, L52678, L52679

**Rights and Responsibilities:** Oregon law finds that ownership and the rights to reasonable control of water within this state belongs to the public to be managed by the Water Resources Department. Most uses of water require a water right issued by the Water Resources Department. However, state law allows some uses of groundwater without benefit of a water right. Contact the Department for more information. The Water Resources Department cannot guarantee the presence of water in the desired amount on a specific property.

In addition to the above, owners of properties on which a well is located are responsible for maintaining that well in a proper manner. Some basic requirements are listed below:

1. All wells shall be maintained in a condition where they are not a threat to public health or safety, a source of contamination, or a waste of the groundwater resource.
2. All wells shall be securely covered to prevent any foreign substance from entering the well.
3. All wells shall be equipped with an access port or airline so that static water level information can be determined at any time.
4. Well casing must be protected from damage and meet minimum extension requirements.
5. Wells may only be permanently abandoned by a licensed and bonded well constructor or a landowner with a valid permit and bond. Well abandonment must be carried out in accordance with state rules.

If you would like further information about water rights, maintaining / abandoning your well, or wish to receive a copy of the administrative rules concerning well construction, please contact the Oregon Water Resources Department by phone at (503) 378-8455, or by mail at 158 12th Street NE, Salem, OR 97301-4172.

I have read the above describing my basic rights and responsibilities related to well ownership.

Signature of Property Owner(s): James K Ellis

State of OREGON, County of MULTNOMAH.

This instrument was acknowledged before me on 12/5, 2001 *(date)* by JAMES ELLIS *(name of person(s))* as CEO *type of authority - if applicable)* of WACKER SILTRONIC CORP *(name of party on behalf of whom instrument was executed - if applicable)*

Before Me: Jeanne K. Thompson Seal, if any:
Notary Public for Wacker Siltronic Corporation
My commission expires 10/26/02

OFFICIAL SEAL
JEANNE K. THOMPSON
NOTARY PUBLIC-OREGON
COMMISSION NO. 317345
MY COMMISSION EXPIRES OCT. 26, 2002

**Recording Office Use Only**

Recorded in the County of Multnomah, Oregon
C. Swick, Deputy Clerk
Total : 19.00
2002-000865 01/03/2002 10:08:33am ATKLM
B63 1 REC 5.00 SUR 3.00 DOR 10.00 OLIS 1.00

Oregon
John A. Kitzhaber, M.D., Governor

**Water Resources Department**
Commerce Building
158 12th Street NE
Salem, OR 97301-4172
(503) 378-3739
FAX (503) 378-8130
www.wrd.state.or.us

11/15/2001

Dear Well Owner:

In 1996, the Oregon Water Resources Department implemented a well identification program to comply with Oregon Revised Statute (ORS 537.788 - 537.793). This program links existing or newly constructed wells with Department records. The program facilitates better management of Oregon's ground water resources and provides the public easier access to information about specific wells.

As part of the well identification program, the well constructor attached a tag to your well at the time of completion. The last step of this process requires you to file the enclosed "State of Oregon Well Ownership Information Form" with the county clerk's office in which your well is located.

The form must be completed, signed and notarized prior to recording at the county clerk's office in which the well is located **Please contact your county clerk's office for recording fee information, as well as the deed recording number or the legal description, ie; metes and bounds, township, range, section, 1/4 1/4, tax lot numbers.**

You'll need to indicate at the top left-hand corner of the form who should receive this form after the recording process is completed by your county clerk's office. We recommend that you keep it with your records.

The information below was provided by the well constructor who constructed your well. If any of this information is incorrect, please notify the well constructor, so they may submit correct information to the Water Resources Department. You may, however, proceed with recording the Well Ownership Information Form, unless the Well ID (tag) Number is incorrect. If that is so, please contact our office.

| **Well Tag Number: L 52677** | **Well log Number MULT 65247** | **Start Card Number: 135291** |
|---|---|---|

**Owner's Address:**

WACKER SILTRONIC CORP.
7200 NW FRONT AVE
PORTLAND, OR 97283

**Well Location:** 1.00 N 1.00 W 13 **County:** MULT **Tax-lot:** 1200
**Street of Well:** 7200 NW FRONT AVE

If you have any questions regarding this program, please call (503) 378-3739, extension 260.
Thank you for your cooperation with the Well Identification Program.

Sincerely,

Janet Halladey
Well Identification Program

Enclosure

Revised 10/26/2001

Oregon
John A. Kitzhaber, M.D., Governor

**Water Resources Department**
Commerce Building
158 12th Street NE
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| **Well Tag Number: L 52678** | **Well log Number MULT 65248** | **Start Card Number:** |
|---|---|---|

**Owner's Address:**

WACKER SILTRONIC CORP.
PO BOX 83180
PORTLAND, OR 97283

**Well Location:** 1.00 N 1.00 W 13 **County:** MULT **Tax-lot:** 1200
**Street of Well:** 7200 NW FRONT

If you have any questions regarding this program, please call (503) 378-3739, extension 260.
Thank you for your cooperation with the Well Identification Program.

Sincerely,

Janet Halladey
Well Identification Program

Enclosure

Revised 10/26/2001

Oregon
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11/15/2001

Dear Well Owner:

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The form must be completed, signed and notarized prior to recording at the county clerk's office in which the well is located **Please contact your county clerk's office for recording fee information, as well as the deed recording number or the legal description, ie; metes and bounds, township, range, section, 1/4 1/4, tax lot numbers.**

You'll need to indicate at the top left-hand corner of the form who should receive this form after the recording process is completed by your county clerk's office. We recommend that you keep it with your records.

The information below was provided by the well constructor who constructed your well. If any of this information is incorrect, please notify the well constructor, so they may submit correct information to the Water Resources Department. You may, however, proceed with recording the Well Ownership Information Form, unless the Well ID (tag) Number is incorrect. If that is so, please contact our office.

| **Well Tag Number: L 52679** | **Well log Number MULT 65249** | **Start Card Number:** |
|---|---|---|

**Owner's Address:**

WACKER SILTRONIC CORP.
PO BOX 83180
PORTLAND, OR 97283

**Well Location:** 1.00 N 1.00 W 13 **County:** MULT **Tax-lot:** 1200
**Street of Well:** 7200 NW FRONT

If you have any questions regarding this program, please call (503) 378-3739, extension 260.
Thank you for your cooperation with the Well Identification Program.

Sincerely,

Janet Halladey
Well Identification Program

Enclosure

Revised 10/26/2001

SCOEPA00010124

# *County Clerk Offices*
# *In the State of Oregon*

*The "**Well Ownership Information Form**" that you have signed and had notarized should be mailed to the county recorder for the county in which your well is located. Please contact the appropriate recorder's office below for recording fee information, deed recording number, and metes and bounds, legal description, before mailing them your form and payment.*

**NOTE:** **The following addresses and telephone numbers are subject to change. Please check your local telephone directory assistance if you have problems.**

**Baker County Clerk**
1995 3rd St., Suite 150
Baker City, OR 97814
Ph# (541) 523-8207

**Benton County Clerk**
Courthouse
120 NW 4th St.
Corvallis, OR 97330
Ph# (541) 766-6831

**Clackamas County Clerk**
104 11th St.
Oregon City, OR 97045
Ph# (503) 655-8551

**Clatsop County Clerk**
PO Box 178
749 Commercial
Astoria, OR 97103
Ph# (503) 325-8511

**Columbia County Clerk**
Courthouse
St. Helens, OR 97051-0010
Ph# (503) 397-3796

**Coos County Clerk**
Courthouse
Coquille, OR 97423
Ph# (541) 396-3121, ext. 228

**Crook County Clerk**
300 NE 3rd, Room 23
Prineville, OR 97754
Ph# (541) 447-6553

**Curry County Clerk**
PO Box 746
Gold Beach, OR 97444
Ph# (541) 247-7011, ext. 209

**Deschutes County Clerk**
1340 NW Wall St.
Bend, OR 97701
Ph# (541) 388-6549

**Douglas County Clerk**
PO Box 10
1036 SE Douglas, Room 221
Roseburg, OR 97470-0004
Ph# (541) 440-4323

**Gilliam County Clerk**
PO Box 427
221 S Oregon
Condon, OR 97823-0427
Ph# (541) 384-2311

**Grant County Clerk**
201 S. Humbolt, Suite 290
Canyon City, OR 97820-0039
Ph# (541) 575-1675

**Harney County Clerk**
450 North Buena Vista
Burns, OR 97720
Ph# (541) 573-6641

**Hood River County Recorder**
309 State St.
Hood River, OR 97031-2093
Ph# (541) 386-1442

**Jackson County Clerk**
10 South Oakdale
Medford, OR 97501-2952
Ph# (541) 774-6152

**Jefferson County Clerk**
75 SE "C" Street
Madras, OR 97741
Ph# (541) 475-4451

**Josephine County Clerk**
Courthouse
PO Box 69
Grants Pass, OR 97528-0203
Ph# (541) 474-5240

**Klamath County Clerk**
305 Main St.
Klamath Falls, OR 97601
Ph# (541) 883-5134

**Lake County Clerk**
513 Center
Lakeview, OR 97630-1579
Ph# (541) 947-6006

**Lane County Clerk**
**Lane Co. Deeds & Records**
125 East 8th
Eugene, OR 97401-2671
Ph# (541) 682-3654

**Lincoln County Clerk**
Courthouse Rm 201
225 West Olive St
Newport, OR 97365
Ph# (541) 265-4121

**Linn County Clerk**
PO Box 100
300 4th Avenue SW
Albany, OR 97321
Ph# (541) 967-3829

**Malheur County Clerk**
251 "B" St W., Suite 4
Vale, OR 97918
Ph# (541) 473-5151

**Marion County Clerk**
100 High St. NE, Rm 1331
Salem, OR 97301-3670
Ph# (503) 588-5225

**Morrow County Clerk**
PO Box 338
100 Court St.
Heppner, OR 97836-0338
Ph# (541)676-9061

**Multnomah County Clerk**
PO Box 5007
Portland, OR 97208-5007
Ph# (503) 988-3034

**Polk County Clerk**
850 Main Street
Dallas, OR 97338-3179
Ph# (503) 623-9217

**Sherman County Clerk**
PO Box 365
500 Court St
Moro, OR 97039-0365
Ph# (541) 565-3606

**Tillamook County Clerk**
201 Laurel Avenue
Tillamook, OR 97141
Ph# (503) 842-3402

**Umatilla County Clerk**
PO Box 1227
216 SE 4th
Pendleton, OR 97801
Ph# (541) 278-6236

**Union County Clerk**
1001 4th St., Suite D
La Grande, OR 97850
Ph# (541) 963-1006

**Wallowa County Clerk**
101 S. River, Rm 100
Enterprise, OR 97828-1335
Ph# (541) 426-4543 Ext.15

**Wasco County Clerk**
511 Washington St.
The Dalles, OR 97058
Ph# (541) 296-6159

**Washington County Clerk**
Public Services Building
155 N. 1st St., Suite 130MS9
Hillsboro, OR 97124
Ph# (503) 846-8752

**Wheeler County Clerk**
PO Box 327
701 Adams St.
Fossil, OR 97830-0327
Ph# (541) 763-2400

**Yamhill County Clerk**
535 NE 5th St., Rm 119
McMinnville, OR 97128-4593
Ph# (503) 434-7518

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revised 10/01

Oregon
John A. Kitzhaber, M.D., Governor

**Water Resources Department**
Commerce Building
158 12th Street NE
Salem, OR 97301-4172
(503) 378-3739
FAX (503) 378-8130
www.wrd.state.or.us

Dear Well Owner:

The Oregon Water Resources Department (Department) recently received a well report (well log) or an application for a well identification label for your property. This letter provides information about when a water right is required for using ground water. If you already have a water right for the intended or existing use from the well, have already applied for a water right, or do not exceed the limits listed below, you may disregard this letter.

A water right permit issued by this Department is required for any use of ground water **except** those uses listed below:

- group and single-family domestic use up to 15,000 gallons per day;
- livestock watering;
- watering any lawn and/or non-commercial garden totaling one-half acre or less in area;
- any single industrial or commercial use of up to 5,000 gallons per day;
- down-hole heat exchangers; and
- irrigation of up to 10 acres of school grounds within established critical ground water areas.

If your use of ground water requires a water right permit, you should be aware that there are several areas in the state within which water rights may either not be issued or may only be issued for limited purposes or times. In addition, in all areas of the state, restrictions may also apply based on the location and construction of your well. Please contact your local watermaster for more information.

Use of ground water without a water right when one is required is illegal and could subject the user to civil and criminal penalties.

If you have any questions or need more information, please check our website at *www.wrd.state.or.us* or contact the watermaster for your area. A list of watermasters is on the back of this letter for your convenience.

wrnoticewwoif

# WATERMASTERS BY COUNTY

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| BAKER | RICK LUSK | 8 | 1995 3rd St Suite 180<br>Baker County Courthouse | Baker City | OR | 97814 | 1-541-523-8224 | FAX# 1-541-523-7866 |
| BENTON | BILL FERBER | 16 | 158 12th Street NE | Salem | OR | 97310 | 1-503-378-8455 ext. 375 | FAX# 1-503-378-6203 |
| CLACKAMAS | BILL FERBER | 16 | 158 12th Street NE | Salem | OR | 97310 | 1-503-378-8455 ext. 375 | FAX# 1-503-378-6203 |
| CLATSOP | GREG BEAMAN | 1 | c/o Port of Tillamook Bay<br>4000 Blimp Blvd | Tillamook | OR | 97141 | 1-503-842-2413 X119 asst112 | FAX# 1-503-842-2722<br>PORT FAX# 1-503-842-3680 |
| COLUMBIA | GREG BEAMAN | 1 | c/o Port of Tillamook Bay<br>4000 Blimp Blvd | Tillamook | OR | 97141 | 1-503-842-2413 x119 asst112 | FAX# 1-503-657-2188<br>PORT-503-842-3680 |
| COOS | LLOYD VANGORDON | 19 | Coos Co Annex/290 N Central St | Coquille | OR | 97423 | 1-547-396-3121 X254 | FAX# 1-503-396-6233 |
| CROOK | KYLE GORMAN | 11 | 1340 NW Wall, Suite 100 | Bend | OR | 97701 | 1-541-388-6669 | FAX# 1-541-388-5101 |
| CURRY | LLOYD VANGORDON | 19 | Coos Co Annex/290 N Central St | Coquille | OR | 97423 | 1-541-396-3121 ext. 254 | FAX# 1-541-396-6233 |
| DESCHUTES | KYLE GORMAN | 11 | 1340 NW Wall, Suite 100 | Bend | OR | 97701 | 1-541-388-6669 | FAX# 1-541-388-5101 |
| DOUGLAS | DAVID WILLIAMS | 15 | Douglas County Courthouse, Rm 306 | Roseburg | OR | 97470 | 1-541-440-4255 | FAX# 1-541-440-6264 |
| GILLIAM | VERN CHURCH | 21 | PO BOX 427 | Condon | OR | 97823 | 1-541-384-4207 | FAX# 1-541-384-2167 |
| GRANT | KELLY RISE | 4 | 201 S. Humbolt St, Suite 180<br>Grant County Courthouse | Canyon City | OR | 97820 | 1-541-575-0119 | FAX# 1-541-575-2248 |
| HARNEY | MITCH LEWIS | 10 | Harney County Courthouse<br>PO BOX 699 | Burns | OR | 97720 | 1-541-573-2591 | FAX# 1-541-573-8311 |
| HOOD RIVER | LARRY TOLL | 3 | 421 E 7th Street<br>Courthouse Annex B, Rm. 218 | The Dalles | OR | 97058 | 1-541-298-4110 | FAX# 1-541-298-2459 |
| JACKSON | LARRY MENTEER | 13 | Jackson County Courthouse<br>10 S. OAKSDALE, ROOM 3099 | Medford | OR | 97501 | 1-541-776-7056 | FAX# 1-541-776-7189 |
| JEFFERSON | KYLE GORMAN | 11 | 1340 NW Wall, Suite 100 | Bend | OR | 97701 | 1-541-388-6669 | FAX #1-541-388-5101 |
| JOSEPHINE | BRUCE SUND | 14 | 942 S.W. 6TH ST, Suite E | Grants Pass | OR | 97526 | 1-541-471-2886 | FAX# 1-541-471-2876 |
| KLAMATH | DEL SPARKS | 17 | 5170 Summers Lane | Klamath Falls | OR | 97603 | 1-541-883-4182 ext. 223 | FAX# 1-541-885-3324 |
| LAKE | JEREMY GIFFIN | 12 | 513 Center Street | Lakeview | OR | 97630 | 1-541-947-6038 | FAX# 1-541-947-6063 |
| LANE | MIKE MATTICK | 2 | Central Lane Justice Court<br>220 North Fifth | Springfield | OR | 97477 | 1-541-682-3620 | FAX# 1-541-746-1861 |
| LINCOLN | GREG BEAMAN | 1 | c/o Port of Tillamook Bay<br>4000 Blimp Blvd | Tillamook | OR | 97141 | 1-503-842-2415 x119 asst112 | FAX 1-503-842-2188<br>PORT-503-842-3680 |
| LINN | MIKE MATTICK | 2 | Central Lane Justice Court<br>220 North Fifth | Springfield | OR | 97477 | 1-541-682-3620 | FAX# 1-541-746-1861 |
| MALHEUR | RON JACOBS | 9 | Malheur County Courthouse #4<br>251 B Street West | Vale | OR | 97918 | 1-541-473-5130 | FAX# 1-541-473-5522 |
| MARION | BILL FERBER | 16 | 158 12th Street NE | Salem | OR | 97918 | 1-503-378-8455 ext. 375 | FAX# 1-503-378-6203 |
| MORROW | TONY JUSTUS | 5 | 116 SE Dorion Avenue | Pendleton | OR | 97801 | 1-541-278-5456 ext. 290<br>1-541-276-7851 After 5 pm | FAX# 1-541-278-0287 |
| MULTNOMAH | MIKE MCCORD | 20 | 1678 S Beavercreek Rd | Oregon City | OR | 97045 | 1-503-722-1410 | FAX# 1-503-722-5926 |
| POLK | BILL FERBER | 16 | 158 12th Street NE | Salem | OR | 97310 | 1-503-378-8455 ext. 375 | FAX# 1-503-378-6203 |
| SHERMAN | LARRY TOLL | 3 | Courthouse Annex B, Rm 218<br>421 East Seventh St. | The Dalles | OR | 97058 | 1-541-298-4110 | FAX# 1-541-298-2459 |
| TILLAMOOK | GREG BEAMAN | 1 | c/0 Port of Tillamook Bay<br>4000 Blimp Blvd | Tillamook | OR | 97141 | 1-503-842-2413 X119 asst 112 | FAX# 1-503-842-2722 |
| UMATILLA | TONY JUSTUS | 5 | 116 SE Dorion Avenue | Pendleton | OR | 97801 | 1-541-278-5456 ext. 290<br>1-541-276-7851 After 5 pm | FAX# 1-541-278-0287 |
| UNION | SHAD HATTAN | 6 | 10507 N Mc Alister Road # 3 | La Grande | OR | 97850 | 1-541-963-1031 | FAX# 1-541-963-9637 |
| WALLOWA | SHAD HATTAN | 6 | 10507 N Mc Alister Road # 3 | La Grande | OR | 97850 | 1-541-963-1031 | FAX# 1-541-963-9637 |
| WASCO | LARRY TOLL | 3 | Courthouse Annex B, Rm. 218<br>421 East Seventh St. | The Dalles | OR | 97058 | 1-541-298-4110 | FAX# 1-541-298-2459 |
| WASHINGTON | DARRELL HEDIN | 18 | 111 NE Lincoln #220 | Hillsboro | OR | 97124 | 1-503-846-4881 | FAX# 1-503-846-4887 |
| WHEELER | KELLY RISE | 4 | Grant County Courthouse<br>201 S. Humbolt St, Suite 180 | Canyon City | OR | 97820 | 1-541-575-0119 | FAX# 1-541-575-2248 |
| YAMHILL | BILL FERBER | 16 | 158 12th Street NE | Salem | OR | 97310 | 1-503-378-8455 ext. 375 | FAX# 1-503-378-6203 |

SCOEPA00010128

COPY FOR YOUR INFORMATION

November 23, 2000

TARLOW JORDAN & SCHRADER
ATTORNEYS AT LAW

James E. Benedict
Cable Huston Benedict
Haagensen & Lloyd LLP
1001 SW 5th Ave Ste 2000
Portland OR 97204

Re: **Wacker Siltronic Corporation/Rhone-Poulenc AG**
Our File No. 46454/30046

Dear Jim:

As I mentioned to you during our meeting, Wacker received the enclosed correspondence and forms from the Oregon Water Resources Department. I am forwarding the original material to you for completion and filing on behalf of Rhone-Poulenc. Please send me copies of the final completed documents as they are filed with the State of Oregon.

Very truly yours,

TARLOW JORDAN & SCHRADER

***/s/ CHRISTOPHER L. REIVE***

Christopher L. Reive

Enclosures

cc: Wacker Siltronic Corporation


CHRISTOPHER L. REIVE

*Admitted*
Oregon and Washington

PO BOX 230669
PORTLAND, OREGON 97281
503 598 7373 *facsimile*
888 598 7070 *toll-free*
503 598 7070

*Direct Dial*
(503) 598-5544

*E-mail*
chris.reive@tjslaw.com

10/12/00

# Oregon

John A. Kitzhaber, M.D., Governor

**Water Resources Department**
Commerce Building
158 12th Street NE
Salem, OR 97301-4172
(503) 378-3739
FAX (503) 378-8130

Dear Well Owner:

The Oregon Water Resources Department has implemented a well identification program. This program links existing or newly constructed wells with Department records. The program will facilitate better management of Oregon's groundwater resources and provide the public easier access to information about specific wells.

As part of the identification process, the well constructor attached a tag to your well at the time of completion or alteration.

The last step of this process requires you to file the enclosed State of Oregon Well Ownership Information Form ***with the county in which your well is located.*** **This form should be filed with the property deed records at that local County Clerk's Office.** Please check with the local county offices for recording fee information. The form must be signed and notarized prior to recording. Each property owner listed must provide a notarized signature.

The information below was provided by the well constructor who constructed your well. If the data is incorrect please notify the well constructor, so they may submit the proper information to the Water Resources Department.

| **Well Tag Number:** 41410 | **Start Card Number:** 132140 |
|---|---|

**Owner's Address:**

RHONE-POULENC AG
PO BOX 83180
PORTLAND, OR 97283

**Well Location:** 1.00 N 1.00 W 13

**County:** MULT
**Street of Well:** 7200 NW SAINT HELENS RD
**Tax-lot:** 100

## STATE OF OREGON WELL OWNERSHIP INFORMATION FORM
## (FILE WITH COUNTY CLERK'S OFFICE)

Pursuant to ORS 537.788, owners of property on which a well is located shall, within 60 days following the construction and/or alteration of a new well or upon property transfer, **record the following information in the property deed records at the appropriate County Clerks Office.** Either the deed recording number or legal description of the property may be used to identify the property.

**Property Owner Name(s):** _____

**Mailing Address:** _____

**Deed Recording Number (or legal description):** _____

**Well Identification Number(s):** L41410

**Rights and Responsibilities:** Oregon law finds that ownership and the rights to reasonable control of water within this state belongs to the public to be managed by the Water Resources Department. Most uses of water require a water right issued by the Water Resources Department. However, state law allows some uses of groundwater without benefit of a water right. Contact the Department for more information. The Water Resources Department cannot guarantee the presence of water in the desired amount on a specific property.

In addition to the above, owners of properties on which a well is located are responsible for maintaining that well in a proper manner. Some basic requirements are listed below:

1. All wells shall be maintained in a condition where they are not a threat to public health or safety, a source of contamination, or a waste of the groundwater resource.
2. All wells shall be securely covered to prevent any foreign substance from entering the well.
3. All wells shall be equipped with an access port or airline so that static water level information can be determined at any time.
4. Well casing must be protected from damage and meet minimum extension requirements.
5. Wells may only be permanently abandoned by a licensed and bonded well constructor or a landowner with a valid permit and bond. Well abandonment must be carried out in accordance with state rules.

If you would like further information about water rights, maintaining / abandoning your well, or wish to receive a copy of the administrative rules concerning well construction, please contact the Oregon Water Resources Department by phone at (503) 378-8455, or by mail at 158 12th Street NE, Salem, OR 97301-4172.

I have read the above describing my basic rights and responsibilities related to well ownership.

**Signature of all Property Owners:** _____

_____

Signed or attested before me this _____ day of _____, 20_____,

by _____. State of Oregon, County of _____

*(Name(s) of Person(s))*

_____ My Commission Expires: _____

*(Signature of Notary Public)*

(Notary - Please Place Seal Here)

**Recording Office Use Only**
After Recording return to Property Owner(s)

Oregon
John A. Kitzhaber, M.D., Governor

Water Resources Department
Commerce Building
158 12th Street NE
Salem, OR 97301-4172
(503) 378-3739
FAX (503) 378-8130

10/12/00

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As part of the identification process, the well constructor attached a tag to your well at the time of completion or alteration.

The last step of this process requires you to file the enclosed State of Oregon Well Ownership Information Form ***with the county in which your well is located.*** This form should be filed with the property deed records at that local County Clerk's Office. Please check with the local county offices for recording fee information. The form must be signed and notarized prior to recording. Each property owner listed must provide a notarized signature.

The information below was provided by the well constructor who constructed your well. If the data is incorrect please notify the well constructor, so they may submit the proper information to the Water Resources Department.

| **Well Tag Number:** 41409 | **Start Card Number:** 132141 |
|---|---|

**Owner's Address:**

RHONE-POULENC AG
PO BOX 83180
PORTLAND, OR 97283

**Well Location:** 1.00 N 1.00 W 13

**County:** MULT
**Street of Well:** 7200 NW SAINT HELENS RD
**Tax-lot:** 100

## STATE OF OREGON WELL OWNERSHIP INFORMATION FORM
## (FILE WITH COUNTY CLERK'S OFFICE)

Pursuant to ORS 537.788, owners of property on which a well is located shall, within 60 days following the construction and/or alteration of a new well or upon property transfer, **record the following information in the property deed records at the appropriate County Clerks Office**. Either the deed recording number or legal description of the property may be used to identify the property.

**Property Owner Name(s):** _____

**Mailing Address:** _____

**Deed Recording Number (or legal description):** _____

**Well Identification Number(s):** L41409

**Rights and Responsibilities:** Oregon law finds that ownership and the rights to reasonable control of water within this state belongs to the public to be managed by the Water Resources Department. Most uses of water require a water right issued by the Water Resources Department. However, state law allows some uses of groundwater without benefit of a water right. Contact the Department for more information. The Water Resources Department cannot guarantee the presence of water in the desired amount on a specific property.

In addition to the above, owners of properties on which a well is located are responsible for maintaining that well in a proper manner. Some basic requirements are listed below:

1. All wells shall be maintained in a condition where they are not a threat to public health or safety, a source of contamination, or a waste of the groundwater resource.
2. All wells shall be securely covered to prevent any foreign substance from entering the well.
3. All wells shall be equipped with an access port or airline so that static water level information can be determined at any time.
4. Well casing must be protected from damage and meet minimum extension requirements.
5. Wells may only be permanently abandoned by a licensed and bonded well constructor or a landowner with a valid permit and bond. Well abandonment must be carried out in accordance with state rules.

If you would like further information about water rights, maintaining / abandoning your well, or wish to receive a copy of the administrative rules concerning well construction, please contact the Oregon Water Resources Department by phone at (503) 378-8455, or by mail at 158 12th Street NE, Salem, OR 97301-4172.

I have read the above describing my basic rights and responsibilities related to well ownership.

**Signature of all Property Owners:** _____

_____

Signed or attested before me this _____ day of _____, 20____,

by _____. State of Oregon, County of _____

*(Name(s) of Person(s))*

_____ My Commission Expires: _____

*(Signature of Notary Public)*

(Notary - Please Place Seal Here)

**Recording Office Use Only**
After Recording return to Property Owner(s)

SCOEPA00010133

# *State of Oregon*
# *County Clerk Offices*

NOTE: The following addresses and telephone numbers are subject to change. Please check your local telephone directory assistance if you have problems.

**Baker County Clerk**
1995 3rd Street #150
Baker City, OR 97814
Ph# (541) 523-8207

**Benton County Clerk**
Courthouse-120 NW 4th
Corvallis, OR 97330
Ph# (541) 766-6756

**Clackamas County Clerk**
104 11th St.
Oregon City, OR 97045
Ph# (503) 655-8551

**Clatsop County Clerk**
PO Box 178 - 749 Commercial
Astoria, OR 97103
Ph# (503) 325-8511

**Columbia County Clerk**
Courthouse
St. Helens, OR 97051-0010
Ph# (503) 397-3796

**Coos County Clerk**
Courthouse
Coquille, OR 97423
Ph# (541) 396-3121, ext.223

**Crook County Clerk**
300 NE 3rd, Room 23
Prineville, OR 97754
Ph# (541) 447-6553

**Curry County Clerk**
PO Box 746 - 450 North
Gold Beach, OR 97444
Ph# (541) 247-7011, ext.223

**Deschutes County Clerk**
1340 NW Wall Street
Bend, OR 97701
Ph# (541) 388-6546

**Douglas County Clerk**
PO Box 10
Roseburg, OR 97470-0004
Ph# (541) 440-4322

**Gilliam County Clerk**
PO Box 427 - 221 S Oregon
Condon, OR 97823-0427
Ph# (541) 384-2311

**Grant County Clerk**
201 S. Humboldt, Ste 290
Canyon City, OR 97820-0039
Ph# (541) 575-1675

**Harney County Clerk**
450 North Buena Vista
Burns, OR 97720
Ph# (541) 573-6641

**HoodRiver County Recorder**
309 State Street
Hood River, OR 97031-2093
Ph# (541) 386-1442

**Jackson County Clerk**
10 South Oakdale
Medford, OR 97501-2952
Ph# (541) 776-7181

**Jefferson County Clerk**
75 SE "C" Street
Madras, OR 97741
Ph# (541) 475-4451

**Josephine County Clerk**
PO Box 69 - Courthouse
Grants Pass, OR 97526-0203
Ph# (541) 474-5243

**Klamath County Clerk**
305 Main Street
Klamath Falls, OR 97601
Ph# (541) 883-5134

**Lake County Clerk**
513 Center
Lakeview, OR 97630-1579
Ph# (541) 947-6006

**Lane County Clerk**
125 East 8th
Eugene, OR 97401-2671
Ph# (541) 682-3654

**Lincoln County Clerk**
225 West Olive - Rm. 201
Newport, OR 97365
Ph# (541) 265-4121

# Supplement to DEQ's Strategy Recommendation for the Wacker Siltronic Facility

Prepared for Wacker Siltronic Corporation

March 10, 1999

BRIDGEWATER GROUP, INC.

03/13/00

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SCOEPA00010137

# INTRODUCTION

DEQ premised its request for Wacker Siltronic Corporation (Wacker Siltronic) to conduct a remedial investigation on *suspected* links between specific hazardous substance releases or past operations and contamination documented by EPA in sediments adjacent to the Wacker Siltronic facility. Bridgewater Group, Inc. (Bridgewater Group) has reviewed Wacker Siltronic's permit files, site investigation records, spill cleanup files, and property development history. Our analysis indicates that there are no links between Wacker Siltronic's past or current operations and constituents detected in sediments adjacent to the facility.

Bridgewater Group's analysis is presented in this document. The document includes the following:

- An expanded site history that supplements DEQ's *Strategy Recommendation* and provides additional information on site development and past operations.
- An analysis of why Wacker Siltronic's past or current operations are not the source of the constituents detected in Willamette River sediments above Portland Harbor baseline values



SCOEPA00010138

# SITE DEVELOPMENT HISTORY

## Introduction

This section provides a revised and updated description of the site development history for the Wacker Siltronic facility located at 7200 NW Front Avenue in Portland, Oregon (see Figure 1). The information provided herein is being provided to DEQ to supplement the Wacker Siltronic facility *Strategy Recommendation* and to establish the technical basis for good faith negotiations between Wacker Siltronic and DEQ.

## Pre 1900 - 1978

### Property Ownership

According to a March 7, 1985 document entitled *Site History, Wacker Siltronic Corporation, Portland, Oregon* (Portland Development Commission, 1985), as of 1906 the Spokane, Portland and Seattle Railroad owned all or most of the property now occupied by the Wacker Siltronic facility. In 1962, Victor Rosenfeld and H.A. Andersen purchased the property. In 1964, an interest in the property was conveyed to Gilbert Schnitzer. These parties retained ownership until 1978 when the property was purchased by the Portland Development Commission (PDC).

### Site Activities

Prior to 1900, the property was essentially undisturbed lowlands. A portion of the property contained part of a small, shallow lake known as Doane Lake. The property was swampy and subject to flooding in the winter and spring. A creek ran through the property, which was reported to have contained fish in the early part of the century.

In 1908, the Astoria and Columbia River Railroad constructed a double track railroad bridge across Doane Lake and the Willamette River. The railroad track berm split Doane Lake (see Figure 2).

Railroad construction was the only activity conducted on the property until sometime in the mid-1930's when several small marine terminal operations were active on the property. Western Transportation had five small buildings, two piers, and two storage tanks on the riverbank near the railroad bridge. The structures associated with this operation are shown in Figures 2 and 3.

According to the *Site History*, Western Transportation refueled tugs and moored log rafts and barges along the property waterfront. Access to



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Western Transportation's operation was from the east-southeast on a road under the railroad bridge.

Shell Oil Company had a building and dock near the northern corner of the property (see Figures 2 and 3). Shell shipped a by-product produced by the nearby Portland Gas & Coke (PG&C) facility by barge from its dock.

PG&C built a residual oil gasification facility, known as the GASCO facility, in 1913 (CDM, 1987). The plant produced 570 Btu town gas and pressed lampblack briquettes. In 1923, the gasification process was modified to increase aromatic generation and light oil recovery for motor fuel. Two years later, tar recovery and refining were initiated to provide tar for use as road binder. During the 1930's, the plant was expanded and in 1941 a coking plant began production of electrode grade coke and high Btu gas. The plant was shut down in 1956[1].

As part of PG&C's plant expansions that occurred in the 1930s and early 1940s, four effluent settling basins were installed on the eastern portion of their site. Several of these ponds were located on what is now the Wacker Siltronic property (see Figures 4 and 5). These settling basins received discharges from tar boxes and lampblack thickeners. Periodic flooding such as that which occurred in June 1948 (see Figure 6), may have scoured some of the tars deposited in the ponds (CDM, 1987). Prior to the construction of these ponds, tar may have been discharged directly to the river and to low-lying areas (CDM, 1987). Also, PG&C occasionally cleaned out the ponds and placed the dredged materials in low-lying areas, possibly onto what is now the Wacker Siltronic property (CDM, 1987).

During filling of the adjacent Wacker Siltronic property, the three settling ponds were eliminated and according to CDM (1987), the tar was incorporated into the soil fill material in a low lying area paralleling the northwest boundary of Wacker Siltronic's property (see Figures 7 through 10).

From at least 1952 to the mid-1960s, PG&C also stored lampblack on what is now the Wacker Siltronic property. Lampblack may have been discharged to the river and later to the settling ponds (CDM, 1987). Other wastes such as plant demolition rubble, tank bottom sludges, and other miscellaneous wastes may have been disposed in low-lying areas on what is now the Wacker Siltronic property (CDM, 1987). Wacker Siltronic has encountered demolition debris in several onsite excavations.

According to the *Site History*, PG&C contracted with Jack Eatch Construction Company at the nearby rock quarry to provide fill for the property, construct drainage ditches, and perform some clearing operations. Aerial photographs for the early 1960s through 1967 show how land-clearing operations on the property progressed from west to east (see Figures 8 through 10).

By 1957, the Western Transportation dock and piers were removed (see Figure 7). According to the *Site History*, the Shell Oil facility was abandoned by 1957.

---

[1] PG&C became Northwest Natural Gas, the predecessor to Northwest Natural, in 1958. Northwest Natural Gas constructed a liquefied natural gas storage tank in the late 1960s and most of the old gasification plant facilities were demolished.



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The Wacker Siltronic property apparently remained idle from the late 1950s until May 23, 1966 when filling activities started (see Figures 10 and 11). The purchasers (i.e., Victor Rosenfeld and H.A. Andersen) agreed to fill the property to a minimum elevation of thirty feet by December 31, 1973 and to construct industrial buildings on the site by December 31, 1978.

Approximately 1,500,000 cubic yards of imported material were placed on the property. According to the *Site History*, approximately 700,000 cubic yards of material came from hydraulic dredging of the Willamette River. The remaining material came from the rock quarry located on the other side of Highway 30, immediately west of the property. Figure 11 is an aerial photograph of the property taken in 1971. It shows the berm constructed along the shoreline of the Willamette River, filling of the property with dredged materials, and the turbid discharge of water from the filling operation back into the Willamette River.

The Portland Planning Commission approved the request to fill the site. Site filling was completed by December 6, 1975. By 1973, the structures associated with both the Western Transportation and Shell Oil operations were no longer present at the property (see Figure 12). Also by 1967, an unnamed stream that drained the northeast slopes of the Tualatin Mountains, including the area occupied by the rock quarry, was channelized to route water through a ditch and culverts around the southern edge of the property (see Figure 10). The unnamed stream formerly ran across the northwest portion of the property (see Figure 9).

The DEQ *Strategy Recommendation* states that this ditch receives drainage from the Wacker Siltronic property. Bridgewater Group has reviewed the grading plan for the property and has found that none of the property drains to the ditch. Almost all of the facility storm water is collected and conveyed through the combined effluent outfall which discharges to the Willamette River at the far northwest corner of the property. Storm water from the Fab 2 Building area discharges through a separate outfall located at about the center of the property. Two of the Administration Building downspouts discharge through a separate outfall that runs along the west side of the building. The other two Administration Building downspouts and one catch basin near the main entrance (in the turnaround) discharge to a City of Portland storm water outfall that discharges just downstream of the Railroad Bridge.

As is shown in Figure 13, the property was completely filled and was ready for development by the end of 1977.

# 1978 - Present

## Property Ownership

In 1978, the PDC purchased the property as part of a 360-acre urban renewal project. The area included in the project was characterized by poor access and a lack of major utility services. The City of Portland, through PDC, sold $15 million in urban redevelopment bonds to finance purchase of land,



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improvement and realignment of streets, relocation of an existing gas main, and installation of two major storm sewers that would serve the surrounding area. PDC in turn sold 85 acres to Wacker Siltronic on August 17, 1978 for construction of a new silicon wafer plant. Figure 14 shows the property in October 1978 with preliminary plant construction activities underway.

Wacker Siltronic's purchase came at the end of a two-year process where Wacker Chemie of Munich, Federal Republic of Germany, sought a location in the United States for a new silicon wafer plant. Wacker Siltronic, their transaction lawyers, and their design engineer did not suspect that hazardous substances were present at the site prior to the transaction. Wacker Siltronic consulted with DEQ, the City of Portland, the U.S. Army Corps of Engineers, Port of Portland, and Portland Chamber of Commerce regarding environmental requirements and permits needed for the site. PDC offered no information to the prospective purchaser, Wacker Siltronic, about the presence of hazardous substances. DEQ did not inform Wacker Siltronic about the potential presence of hazardous substances, even after the agency sent a representative to Germany to work with Wacker Siltronic on environmental issues.

Wacker Siltronic did not become aware of the potential presence of coal tar residues on its property until 1984 when the Company announced its intent to construct a large polysilicon production plant in the southern portion of the property. In April of 1985, as part of the preliminary engineering for design and construction of the proposed polysilicon plant, Wacker Siltronic confirmed the presence of petroleum products, polynuclear aromatic hydrocarbons (PAHs), and the pesticide 2,4-D in soil in the proposed construction area (CH2M HILL, 1985a). Later in 1985, Wacker Siltronic collected a series of air samples to ensure that its employees were not being exposed to hazardous vapors (CH2M HILL, 1985b). In June 1985, Walker Siltronic formally notified the U.S. Environmental Protection Agency (EPA) regarding the potential for the property to be a hazardous waste site as required under Section 103(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

## Site Activities

Construction of Wacker Siltronic's new plant began immediately after the property was purchased. Construction was completed in December 1979, and operation began in March 1980.

In 1995, Wacker Siltronic significantly expanded the production capacity of the Portland facility by constructing the Fab 2 Building.

**DEQ's *Strategy Recommendation* states that "...Surface runoff at the southwestern edge of the site is directed along the Burlington Northern Railroad right-of-way via a stormwater catch basin, and discharges to the river about ½ mile to the southeast." This is incorrect. According to a topographical map for the property (see Appendix A), no surface runoff from the southwestern edge of the site drains toward the railroad right-of-way.** All surface runoff is captured onsite and discharged through the combined effluent outfall, the Fab 2 Building stormwater outfall, the Adminstration Building roof drain outfall, or the City of Portland stormwater



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outfall. Koppers Industries discharges stormwater to the ditch the runs along the railroad right-of-way.

## Spills or Releases

DEQ's *Strategy Recommendation* references several spills or releases that occurred after the time that Wacker Siltronic purchased the property. This section provides supplemental information regarding these spills or releases, and the Company's investigation and cleanup activities.

### *1979 Olympic Pipeline Petroleum Release*

Olympic Pipeline operates two product lines that are buried within a utility corridor that transects the Wacker Siltronic property from north to south (see Figure 15). One pipeline conveys diesel and kerosene. The other conveys gasoline.

Wacker Siltronic discovered a petroleum release in February 1979 while excavating the foundation for a clarifier in the wastewater treatment plant area. A sample of diesel obtained from the pipeline was analyzed and found to match a sample collected from the clarifier excavation. Wacker Siltronic notified Olympic Pipeline regarding the potential for a leak in one or both of their product lines. Olympic Pipeline excavated and exposed their pipelines. Holes were discovered in a section of the pipeline and oil was found along a portion of the utility corridor to the northwest and southwest of the clarifier excavation. Wacker or Olympic Pipeline notified DEQ of the release and the agency visited the plant site in February of 1979.

Olympic Pipeline replaced the section of leaking pipeline. They also addressed floating product found in the clarifier and pipeline excavations by excavating a water separation pit southeast of the clarifier excavation and then pumping floating product and water into the pit. Olympic Pipeline then skimmed the floating product from the pit and pumped it into tanker trucks. After completing the skimming operation, Olympic Pipeline backfilled the pit. They also removed residual oil and stained soil remaining in the bottom of the clarifier excavation. Wacker Siltronic does not have a record of any cleanup action or closure report for this release.

### *1980 Chromium Release*

According to DEQ's *Strategy Recommendation*, chromium was found in the Wacker Siltronic wastewater treatment plant concentrated acid system on December 16, 1980. On that date, chromic acid entered a concentrated acid drain. Some of the acid was treated in the neutralization tank and discharged before the acid release was observed. When Wacker Siltronic staff observed a green color in the plant's wastewater, the source of the chromic acid was found and stopped. An estimated 5.5 pounds of chromium was captured within the plant's wastewater treatment plant and taken to the hazardous waste landfill in Arlington, Oregon for disposal. None of the chromic acid was released to soil underlying the wastewater treatment plant. However, approximately 1.3 pounds of chromium was discharged to the Willamette



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River. This one time release is small when compared to the permitted discharge limits specified in Walker Siltronic's NPDES Waste Discharge Permit No. 93450. This permit allows Wacker Siltronic to discharge up to 0.5 pounds per day of total chromium as a monthly average and up to 1 pound per day as a daily maximum. Wacker Siltronic's actual average total chromium discharge is far less than is allowed by its permit. Wacker Siltronic only discharges between 0.02 and 0.03 pounds per day, or 7 to 11 pounds per year.

### *1981 Chromic and Nitric Acid Leak*

According to DEQ's *Strategy Recommedation*, chromic acid was spilled after a tank overflowed. The chromic acid entered a floor drain and sump at the Wacker Siltronic facility.

Bridgewater Group reviewed Wacker Siltronic's spill records and found that the acid etch solution from a rinse operation in the materials characterization production area did enter a floor drain and sump, but there was no release to soil or surfacewater. The sump had a transfer pump that conveyed the acid to a storage tank. When the storage tank was completely filled it overflowed into the secondary containment for the storage tank. Flow into the storage tank and to its secondary containment continued until the source of the leak was discovered. Flow into the tank was stopped before the acid was able to overtop the secondary containment. Wacker Siltronic brought in a tanker truck to remove the acid and rinse water solution. Approximately 6,000 gallons of acid and rinse water solution were treated and disposed at the hazardous waste landfill in Arlington, Oregon.

### *1984 Trichloroethylene Spills*

In December of 1984, two trichloroethylene (TCE) spills occurred from its TCE Stripper. The first spill occurred on December 3, 1984. A solution containing TCE was spilled when a surge tank overflowed. Wacker Siltronic estimated that 0.33 gallons of TCE were spilled. Wacker Siltronic determined that this spill did not exceed reportable quantity requirements. The second spill occurred on December 31, 1984, again due to overflow from a surge tank. Wacker Siltronic estimated that 11.6 gallons of TCE were spilled. This spill was reported to DEQ.

On January 2, 1985, Wacker Siltronic collected soil samples from the area around the TCE Stripper. The sampling results were provided to DEQ. DEQ and Wacker Siltronic agreed to a cleanup plan that included the removal of surface soils from an area immediately around the TCE Stripper and from a second area between the Reverse Osmosis/Deionized Water (RO/DI) Storage Tanks and sidewalks. Between January 14 and 20, 1985 Wacker Siltronic removed 113 cubic yards of soil and then resampled the spill area. Following several months of discussion between DEQ and Wacker Siltronic regarding the completeness of the soil removal action, Wacker Siltronic decided to remove an additional 15 cubic yards of soil on April 10, 1985. The soils from both removal actions were taken to the hazardous waste landfill in Arlington, Oregon. Soil sampling results indicated that TCE concentrations



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were less than 1 mg/kg. Because both TCE spills occurred in essentially the same location, the cleanup action addressed both spills.

Based on these results, DEQ issued a letter to Wacker Siltronic on April 16, 1985 which stated that "... all residue of the TCE spill which occurred at your facility ...has been removed to below background levels (less than one part per million)." In its letter, DEQ approved filling the soil excavations, construction of a spill containment area around the stripper, and Wacker Siltronic's cleanup work.

As of 1988, Wacker Siltronic stopped using TCE at the facility.

### *1987 Organic Wastewater Overflow*

On June 25, 1987, a mixture of weak detergents and surfactants from the organic wastewater system overflowed onto a gravel yard and the main roadway when a wastewater line plugged. The overflow entered a stormwater catch basin and then discharged into the Willamette River through the combined effluent outfall located at the far northwest corner of the property. Wacker Siltronic estimated that the organic wastewater (OWW) flow was 3 to 5 gallons per minute and the pH was neutral (i.e., between 6 and 9). Wacker Siltronic estimates that the total discharge was 2,000 gallons.

Wacker Siltronic collected a soil sample near the catch basin. The soil sample was analyzed for pH, flash point, total metals, cyanide, sulfide, PCBs, phenol, and solvents. An EP Toxicity analysis was also performed on the soil sample. This suite of analyses was selected for purposes of profiling the soil for waste management purposes, in anticipation of the need for soil removal, not because the organic wastewater would have contained these constituents.

Six metals were detected in the soil sample: barium at 71.8 mg/kg, chromium at 9.37 mg/kg, copper at 16.3 mg/kg, lead at 41.9 mg/kg, nickel at 9.61 mg/kg, and zinc at 53.3 mg/kg[2]. No cyanide, sulfide, PCBs, phenol, or solvents were detected.

The only metal detected in the EP Toxicity analysis was barium at 0.276 mg/L.

No cleanup was conducted given the few constituents that were detected and low concentrations of the constituents that were detected.

### *1988 Pentachlorophenol Detection in Wastewater Discharge*

According to DEQ's *Strategy Recommendation*, on January 11, 1988, pentachlorophenol (PCP) was detected in one of Wacker Siltronic's wastewater effluent samples at 0.2 mg/L.

Bridgewater Group reviewed Wacker Siltronic's NPDES Monitoring Reports and related correspondence for 1988. On January 27, 1988 DEQ requested

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[2] These metal concentrations are below DEQ's residential and industrial maximum allowable soil concentrations in Appendix 1, Oregon Soil Cleanup Table in OAR 340-122.



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that Wacker Siltronic sample for PCP in its combined effluent discharge based on the detection of PCP during its annual analysis of toxic organic (TTO) compounds in accordance with permit requirements. On January 29, 1988 Wacker Siltronic collected two samples: RO/DI water and combined effluent. No PCP was detected in the RO/DI water sample at a detection limit of 0.002 mg/L. PCP was detected in the combined effluent sample at a concentration of 0.004 mg/L. Wacker Siltronic sampled the combined effluent for PCP in February, March, and April, and did not detect PCP at a detection limit of 0.005 mg/L. According to a May 5, 1998 letter, DEQ agreed that Wacker Siltronic could discontinue sampling after April.

### *1990 BTEX Discovery*

In June of 1990, Wacker Siltronic installed two geotechnical borings in an area of a proposed manufacturing plant expansion (known as Fab 2). Benzene, toluene, ethylbenzene, and xylenes (BTEX) were found in soil samples collected from the two borings.

In October of 1990, Walker Siltronic retained CH2M HILL to assess the possibility that one or both of the Olympic Pipeline pipelines was the source of BTEX. As was discussed above, an earlier leak had occurred from one of the pipelines in 1979.

CH2M HILL conducted a groundwater and soil gas investigation along a 600-foot length of the utility corridor that contains the pipelines (see Figure 15). BTEX and total petroleum hydrocarbons (TPH) were found at a number of the sampling locations with the highest concentrations detected in groundwater at GW-11 and GW-7. These sampling locations were immediately adjacent to the utility corridor. BTEX and TPH concentrations generally decreased with distance away from the utility corridor, but were found at elevated concentrations (i.e., TPH at 12,040 ug/L and benzene at 5,920 ug/L in groundwater) in the proposed construction area. No free product was found, but a black, viscous substance that CH2M HILL presumed to be coal-tar-derived waste was found in several of the sampling locations. CH2M HILL concluded that the most likely source of the BTEX detected in groundwater was a gasoline leak (CH2M HILL, 1990).

In October, Wacker Siltronic reported the potential leak to Olympic Pipeline and DEQ. Several months later, Olympic Pipeline responded by retaining a contractor to excavate and expose the pipelines. No gasoline smell or leaks were observed. Olympic Pipeline subsequently pressurized the pipelines to 250 pounds per square inch (psi) for eight hours. Although Olympic Pipeline found that the pipelines held the pressurization, they concluded that the test was not conclusive. Olympic Pipeline agreed to pressurize the lines again to substantiate whether there was a leak.

Pressure testing of 2,500-foot sections of both pipelines at 790 psi was conducted February 27, 1991. Olympic Pipeline concluded that neither of the pipelines leaked, but that one of the pipelines ruptured during the test. Olympic Pipeline agreed to replace both pipelines.

In March of 1991, Olympic Pipeline capped the old pipelines in-place. New pipelines were connected and pressure tested at 1,100 psi.



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In 1995, Wacker Siltronic obtained a Petroleum Contaminated Soil Treatment Permit (#PCSLA-NWR-95-004) from DEQ to treat onsite soils excavated from the Fab 2 Building construction site. The permit allowed Wacker Siltronic to treat the soils using thermal treatment and to transport the soils to St. Johns Landfill if TPH as gasoline concentrations were at or below 40 mg/kg and TPH as waste oil, heating oil and heavy oil were at or below 100 mg/kg. In accordance with the DEQ-approved soil management plan, Wacker Siltronic staff determined whether soils were contaminated based on odor and visual staining. When contaminated soils were encountered, the soils were placed into drop boxes and sampled for waste management purposes in accordance with the soil management plan. Wacker Siltronic excavated and treated 5,491 tons of soil in accordance with a DEQ-approved soil management plan. All of the treated soils that were transported to St. Johns Landfill met the treatment requirements in the permit (Wacker Siltronic, 1995a and 1995b). The portion of the property used for soil treatment was cleaned, sampled, and closed in accordance with permit requirements (Wacker Siltronic, 1995b).

### *1991 Weak Acid Storage Tank Leak*

On September 11, 1991 a weak acid storage tank leaked when a valve sheared off. Approximately, 4,000 gallons of weak acid was released to the ground. According to DEQ's Release Report and Evaluation Form for this leak (OERS #91-062), the release consisted of spent, deionized rinsewater. Wacker Siltronic blocked all storm drains to prevent the leak from leaving the wastewater treatment area. The pH of the weak acid at the time of the leak is unknown; the pH of the weak acid varies. According to Wacker Siltronic environmental staff, approximately, 1,000 gallons of the weak acid were recovered. The remainder would have likely neutralized within the soil column and not mobilized any significant quantities of metals. DEQ concluded that the release was not a hazardous waste, did not exceed a reportable quantity, and that no NPDES effluent limits were exceeded. DEQ further concluded that the release required no further investigation, removal, remedial action, or long-term environmental or institutional controls.

### *1997 Caustic Rinse Water Release*

On April 28, 1997, a release of caustic rinse water from an ion-enchange regeneration unit occurred when a flange on the discharge side of a pump failed and allowed rinse water to spray outside a containment area. The area covered by the release was unpaved. The rinse water release wetted the soil and pooled in some locations, but did not runoff from the immediate area. Wacker Siltronic neutralized the spilled rinse water and then cleaned up the spill with a vacuum truck. The recovered rinse water was treated on site in the wastewater treatment plant. The failed equipment was repaired and placed back into service.

Wacker Siltronic calculated that between 36 and 55 pounds of caustic were released, which according to Wacker Siltronic was below the reportable quantity for caustic.

Soil samples were collected to determine if soil cleanup was necessary. Five samples, four from the spill area and one from a control area, were collected



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and analyzed for pH in accordance with EPA SW-846 Method 9045. The sample results for the spill area ranged from 7.4 to 11.3. The pH in the control sample was 7.6.

Based on these results, Wacker Siltronic removed soil surrounding the locations with the highest pH. Soil was excavated to a depth of approximately 6 inches and additional soil samples were collected. The pH of these soil samples was the same as the control sample +/- 0.5 pH unit.

The excavated soils were sent to USA Waste Services, Inc. for disposal under a special waste permit. The soil excavations were backfilled with new gravel.

### *1998 Release During Dredging*

During the summer of 1998, Wacker Siltronic implemented a river bank stabilization project to repair damage caused by the February 1996 flood. The project included the placement of 5,415 cubic yards of Class 500 rock rip rap above ordinary high water (OHW) and 2,300 cubic yards of Class 1000 rock rip rap below OHW along 2,500 feet of the Willamette River shoreline.

An oil sheen was observed on July 29, 1998 when silt was being dredged to be used as backfill behind the rip rap. Figure 15 shows the approximate location where the silt was dredged. Wacker Siltronic notified the Coast Guard. The Coast Guard visually inspected the area and stated that it was under control. No followup was required by the Coast Guard. Wacker Siltronic also notified DEQ and EPA. DEQ stated that the oil sheen was not due to a spill, rather it was due to an existing problem. EPA stated that no followup was required.

Wacker Siltronic instructed the dredging contractor, Advanced American Diving, to place the dredged sediments on the bank and then transfer them into eight, 20-yard, lined drop boxes. The sediments were sampled and profiled for waste management purposes. Approximately, 115 tons of contaminated material, as opposed to the 75.72 tons stated in DEQ's *Strategy Recommendation*, was sent to Arlington for disposal. The sediments were found to contain total petroleum hydrocarbons. The laboratory quantified TPH concentrations falling within the following three hydrocarbon ranges: gasoline at 7.49 to 69 mg/kg, diesel at 399 to 5,810 mg/kg, and heavy oil at 293 to 2,970 mg/kg. According to Philip Neuremburg of North Creek Analytical, the laboratory that performed the TPH analyses, the chromatograms for the samples are consistent with coal tar or creosote standards, not gasoline or diesel standards. TCLP metals, pesticides, VOCs, SVOCs, and herbicides tests were run on a composite sediment sample. Barium was the only metal detected in the TCLP test at a concentration of 0.562 mg/L. No pesticides, VOCs, SVOCs, or herbicides were detected in the TCLP tests.

Bridgewater Group reviewed Wacker Siltronic's spill records and historic petroleum use. As will be discussed in the next section, Wacker Siltronic's past or current operations could not have lead to the contamination found during the 1998 bank stabilization project.



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# DISCUSSION OF CONSTITUENTS DETECTED IN NEAR SHORE SEDIMENTS RELATIVE TO OPERATIONS AT WACKER SILTRONIC

## Introduction

According to DEQ's *Strategy Recommendation*, a number of constituents were detected in seven sediment samples collected proximate to the Wacker Siltronic property above the apparent Portland Harbor sediment baseline maximum values. Figure 16 shows the location of the sediment samples collected adjacent to the property. DEQ's *Strategy Recommendation* asserts that past or current operations conducted by Wacker Siltronic led to the observed exceedances of the apparent harbor baseline maximum sediment concentrations. These exceedances are summarized in Table 1.

This section presents Bridgewater Group's analysis and conclusions regarding the observed sediment quality adjacent to the Wacker Siltronic site. A key outcome of Bridgewater Group's analysis is that there is no link between the constituents detected in Willamette River sediments and past or current operations conducted by Walker Siltronic.

## Metals

According to DEQ's *Strategy Recommendation*, the following metals are present in sediment samples above the harbor baseline values: beryllium, cobalt, iron, manganese, selenium, silver, titanium, vanadium, and zinc. As DEQ states in its *Strategy Recommendation*, the majority of these constituents exceed harbor baseline by less than 20 percent.

The presence of these metals at concentrations above the harbor baseline values is not due to past or present operations conducted by Wacker Siltronic. Silicon wafer production involves a high purity process that is essentially metal-free. Virtually all of Wacker Siltronic's manufacturing processes are metal-free, even the process piping and tanks.

The only metal used in the process is chrome, which is used to test for defects during wafer production. As was discussed in the previous section, Wacker Siltronic is permitted to discharge up to 1 pound per day, on average, of total chromium, but typically only discharges 0.02 to 0.09 pounds per day of total chromium. As DEQ states in its *Strategy Recommendation*, chromium levels in sediments at the Wacker Siltronic facility do not exceed the harbor baseline values.



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DEQ's *Strategy Recommendation* suggests that Wacker Siltronic's facility is a potential source of antimony to Willamette River sediments. Antimony is used during the crystal growing process. It is placed in a furnace and heated along with silicon. Dust emissions from the furnace are captured by a filter collector system. The filtered dusts are managed as a solid waste. No water or scrubbing technology is used in the filter system. Therefore, it is unlikely that antimony would be present in any water-related discharges from the facility.

**While the DEQ Strategy *Recommendation* is correct with respect to Wacker Siltronic's use of chromium and antimony, it is not correct about the Company's use of mercury. Mercury is not used in the process and, therefore, the downstream presence of mercury in sediments at concentrations above harbor baseline values is not associated with Wacker Siltronic's past or current operations.** The only uses of mercury at the facility are in measurement systems, fluorescent lights, and electrical switches. Mercury used in the measurement systems is vacuumed into containers and sent to a mercury refiner for reclamation. Mercury contained in lights and switches is managed as a universal waste and sent offsite.

There are two potential explanations for the presence of certain metals in sediments above harbor baseline values. The first is that sediments transported into the Portland Harbor contain metals at concentrations equal to and greater than those found at the Wacker Siltronic site. Table 2 lists metal concentrations measured by the USGS on suspended sediments at the Willamette River gaging station at Portland (i.e., at the Morrison Bridge). Most of the metals concentrations detected in sediment samples collected adjacent to the Wacker Siltronic site are within the range, and are generally near the lower end of the range, of metals concentrations measured by the USGS.

Second, as was discussed above, the property was filled between 1966 and 1973 with 1,500,000 cubic yards of rock quarry overburden and dredged materials. The overburden was obtained from a rock quarry located across Highway 30 from the property. The overburden itself and any excess rock from the quarry may be a source of some of the metals detected in sediments. For instance, the iron detected in sediments may, in part, have come from the historic rock quarrying operation that drained into an unnamed creek that flowed across the northwest portion of the property before it was filled. Wacker Siltronic has observed iron staining at the City of Portland's stormwater outfall located just downstream of the Railroad Bridge and at the Fab 2 stormwater outfall located near the center of the property. Also, as Figure 11 illustrates, water that drained from the property during filling with dredged materials was turbid. Drainage from the dredge fill operation could have carried fine-grained sediments containing metals back into the river.



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# Semivolatile Organics and PAHs

## Low Molecular Weight Polynuclear Aromatic Hydrocarbons (LPAH)

DEQ has grouped six low molecular weight PAHs into a single chemical category for the purposes of presenting harbor sediment information. LPAH constituents include naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, and anthracene.

DEQ reported that all seven sediment samples collected off the Wacker Siltronic site exceeded the apparent harbor baseline maximum LPAH concentration of 700 μg/kg with surface sediment sample SD070 containing over 100 times the LPAH compared to the harbor baseline value. Downriver sediment samples SD065 and SD067 also exceeded the harbor baseline values by a factor of 237 and 161, respectively.

### *Chemical Background*

While some individual uses and markets for the individual LPAH constituents exist, all LPAH, HPAH, and other semivolatile organic constituents detected in the sediments are major constituents in coal tar; coal tar creosote; and No. 2 diesel and fuel oil (see Table 3). See also discussion under HPAHs, 2-methylnapthalene, and carbazole.

In coal tar, naphthalene is present at an average concentration of 10 percent (100,000 ppm), phenanthrene (5%), fluorene (2%), and anthracene (1.8%). Similar concentrations are observed in coal tar creosote.

Coal tar creosote is the most common form of creosote. It is a thick, oily liquid that is typically amber to black in color, and is a distillation product of coal tar. Coal tar creosote is the most widely used wood preservative in the United States, and is used as a wood preservative and water-proofing agent for railroad ties, telephone poles, marine pilings, and fence posts. It is also a restricted-use pesticide, and is used as an animal and bird repellant, insecticide, animal dip, fungicide, and a pharmaceutical agent for the treatment of psoriasis. About 300 chemicals have been identified in coal tar creosote.

Coal tar and coal tar pitch are the by-products of the high-temperature treatment of coal to make coke or natural gas. They are usually thick, black or dark brown liquids or semi-solids with a naphthalene-like odor. Coal tar products are ingredients in medicines used to treat skin diseases such as psoriasis; they are also used as animal and bird repellants, insecticides, animal dips, and fungicides. Coal tar creosotes, coal tar, and coal tar pitch are similar in composition.

LPAHs are also components (by percent composition) in a number of distillate fuels. Data reported in Composition of Petroleum Mixtures (Total Petroleum Hydrocarbon Criteria Working Group, May 1998) for No. 2 diesel and fuel oil indicates that naphthalene averages 0.22% (2,200



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ppm), acenaphthylene (0.006%), acenaphthene (0.018%), fluorene (0.019%), phenanthrene (0.079%), and anthracene (0.0058%).

### *Assessment of Relevance to Wacker Siltronic Site*

DEQ's *Strategy Recommendation* states that "...Historical operations associated with oil gasification processes at the former GASCO site have resulted in petroleum related contamination at the Wacker site." As was discussed earlier, direct discharges may have occurred to the river prior to when the GASCO plant was expanded in the 1930s. After that, tar was discharged into four settling ponds, three of which were on what is now Wacker Siltronic property. Two of the three sediment sample locations (i.e., SD068 and SD069) where elevated LPAH concentrations were detected are located just offshore of where the ponds were located (see Figure 7). One of the three sediment sampling locations (i.e., SD068) where elevated LPAH concentrations were detected is located about where the former Shell Oil Company dock was located (see Figure 2).

DEQ's *Strategy Recommendation* also states that there may have been spills or waste disposal activities associated with the former Western Transportation facility. Historical releases from this facility may explain the LPAH concentrations detected at sampling locations SD072A (at depth) and SD075 (see Figure 2).

LPAH releases from these historic sources to Willamette River sediments would have decreased in the 1950s when Western Transportation and Shell Oil Company stopped its operations, and in the 1960s when the settling ponds were filled. Subsequent releases would have been further reduced or eliminated in the 1970s when the property was filled with rock quarry overburden and dredged material.

After plant construction in 1978, Wacker Siltronic would not have contributed any additional LPAHs to the Willamette River sediments from its operations. The only source of LPAHs associated with Wacker Siltronic's past and present operations is diesel fuel stored for use in three emergency generators. All of the diesel fuel is stored in aboveground storage tanks that are integral to each generator. Wacker Siltronic has no record of any spill or leak of diesel fuel from its emergency generators.

Therefore, it is Bridgewater Group's conclusion that no link exists between the LPAHs detected in the Willamette River sediments and past or current operations conducted by Wacker Siltronic.

## High Molecular Weight Polynuclear Aromatic Hydrocarbons (HPAH)

DEQ has grouped 10 high molecular weight PAHs into a single chemical category for the purposes of presenting harbor sediment information. HPAH constituents include fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenz(a,h)anthracene, and benzo(g,h,i)perylene.



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DEQ reported that all seven sediment samples collected off the Wacker Siltronic site exceeded the apparent harbor baseline maximum HPAH concentration of 2,400 μg/kg with subsurface sediment sample SD068 contained over 37 times the HPAH compared to the harbor baseline value. Downriver sediment samples SD065 and SD067 also exceeded the apparent harbor baseline values by a factor of 112 and 80, respectively.

### *Chemical Background*

While some individual uses and markets for the individual HPAH constituents exist, all HPAH, LPAH, and other semivolatile organic constituents detected in the sediments are major constituents in coal tar, coal tar creosote, and No. 2 diesel and fuel oil (see Table 3). See also discussion under LPAHs, 2-methylnapthalene, and carbazole.

### *Assessment of Relevance to Wacker Siltronic Site*

The highest HPAH concentrations were detected at sampling locations SD068, SD069, and SD070. As was discussed above, two the these sampling locations are located just offshore of where the settling ponds were located and one of the sample locations is close to the former Shell Oil Company dock.

The next highest HPAH concentrations were detected at sample locations SD072A (at depth) and SD075. DEQ's *Strategy Recommendation* also states that there may have been spills or waste disposal activities associated with the former Western Transportation facility. Historical photographs (see Figures 2 and 3) show that the docks associated with this facility were close to these sampling locations.

HPAH releases from these historic sources to Willamette River sediments would have decreased in the 1950s when Western Transportation and Shell Oil stopped operations, and in the 1960s when the settling ponds were filled. Subsequent releases would have been further reduced or eliminated in the 1970s when the property was filled with rock quarry overburden and dredged material.

After plant construction in 1978, Wacker Siltronic would not have contributed any additional HPAHs to the Willamette River sediments from its operations. The only source of HPAHs associated with Wacker Siltronic's past and present operations is diesel fuel stored for use in three emergency generators. All of the diesel fuel is stored in aboveground storage tanks that are integral to each generator. Wacker Siltronic has no record of any spill or leak of diesel fuel from its emergency generators.

Therefore, it is Bridgewater Group's conclusion that no link exists between the HPAHs detected in the Willamette River sediments and past or current operations conducted by Wacker Siltronic.



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## 2-Methylnaphthalene

2-methylnapthalene was detected above the harbor baseline value of 150 ug/kg in six of the seven sediment samples collected off the Wacker Siltronic facility. The highest 2-methylnaphthalene concentrations were found in the same samples that had elevated LPAH and HPAH concentrations.

### *Chemical Background*

2-methylnapthalene is present in coal tar at up to 1.4 percent (14,000 ppm). During distillation of coal tar, it comprises one of the distillate fractions of coal tar creosote. It is reported in material safety data sheets (MSDS) to be present at 1 to 5 percent (10,000-50,000 ppm) in commercial coal tar creosote treating solutions.

Data reported in *Composition of Petroleum Mixtures* indicates that 2-methylnapthalene is also present in No. 2 diesel fuel at an average concentration of 0.89 percent (8,900 ppm).

### *Assessment of Relevance to Wacker Siltronic Site*

When viewed in the context of the total spectrum of PAHs and semivolatile organics detected in the sediments adjacent to the Wacker Siltronic facility, it appears that 2-methylnapthalene came from the same source(s) as the LPAHs and HPAHs detected in river sediments.

As was discussed above, the only material used by Wacker Siltronic that could be a source of 1-methylnaphthalene is diesel fuel. Wacker Siltronic has no records of any releases or spills of diesel fuel from its emergency generators.

Therefore, it is Bridgewater Group's conclusion that no link exists between the 2-methylnapthalene detected in the Willamette River sediments and past or current operations conducted by Wacker Siltronic.

## Carbazole

Carbazole was detected in six of the seven sediment samples above the harbor baseline of 100 ug/kg. The concentrations reported for all of the surface sediment samples were *estimated* concentrations ranging from 170 to 3,400 ug/kg. The highest carbazole concentrations were detected in the three most downstream sampling locations (i.e., SD068, SD069, and SD070).

### *Chemical Background*

Carbazole is a heterocyclic aromatic compound containing a dibenzopyrrole system, and is produced during coal gasification. Coal tar produced at high temperature contains an average of 1.5% (15,000 ppm) carbazole. Several thousand tons of carbazole are produced each year



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from coal tar and crude oil. It is used widely in synthesis of dyes, pharmaceuticals, and plastics.

Carbazole is also one of the 300+ constituents that comprise creosote used for wood preservation. Depending on the fractionation of the creosote solution, carbazole can comprise up to 1 percent of coal tar creosote.

Data reported in *Composition of Petroleum Mixtures* indicates that mono and di-methyl carbazoles are present in no. 2 diesel fuels at less than 0.001 percent by weight.

### *Assessment of Relevance to Wacker Siltronic Site*

Viewed in the context of the total spectrum of PAHs and semivolatile organics detected in the sediments adjacent to the Wacker Siltronic facility, it appears that carbazole came from the same source(s) as the LPAHs and HPAHs.

Therefore, it is Bridgewater Group's conclusion that no link exists between the carbazole detected in the Willamette River sediments to past or current operations conducted by Wacker Siltronic.

## Dibenzofuran

Dibenzofuran was detected in all seven sediment samples off the Wacker Siltronic site above the harbor baseline value of 100 ug/kg, as well as downriver sediment samples SD065 and SD067. The dibenzofuran concentrations are correlated with total LPAHs and HPAHs, indicating that the dibenzofuran in sediments originated from the same source(s).

### *Chemical Background*

Dibenzofuran (diphenylene oxide) is present in coal tar at up to 1 percent (10,000 ppm). During coal tar distillation, it is recovered in the distillate fractions that comprise coal tar creosote. The only reported use of dibenzofuran as a separate distillate is in insecticides.

Data reported in *Composition of Petroleum Mixtures* does not indicate that dibenzofuran is a constituent in No. 2 diesel fuel.

### *Assessment of Relevance to Wacker Siltronic Site*

When viewed in the context of the total spectrum of PAHs and semivolatile organics detected in the sediments adjacent to the Wacker Siltronic facility, it appears that the dibenzofuran came from the same source(s) as the LPAHs and HPAHs.

Furthermore, Wacker Siltronic has never applied insecticides at the facility.



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Therefore, it is Bridgewater Group's conclusion that no link exists between the dibenzofuran detected in the Willamette River sediments to past or current operations conducted by Wacker Siltronic.

## Pentachlorophenol

Pentachlorophenol (PCP) was detected at concentrations of 7.1 and 6.4 ug/kg at sampling locations SD075 and SD077, respectively. These concentrations are less than the harbor baseline value of < 97ug/kg, as listed in Table F-1, Data Evaluation Summary Table, in the Portland Harbor Sediment Management Plan (PHSMP). The baseline value in the PHSMP is inconsistent with the "detect" value listed in Table 1 of DEQ's Strategy Recommendation.

PCP was also detected in upstream sediment samples SD078, SD080, SD081, and SD088 at concentrations ranging from 4.6 to 11 ug/kg. PCP was detected along with other chlorinated herbicides in a suite of samples collected between River Mile 7 and 7.5.

### *Chemical Background*

PCP is one of the most heavily used pesticides in the U.S. It is used primarily as an industrial wood preservative. It is registered for use by the U.S. Environmental Protection Agency (EPA) as an insecticide (termicide), fungicide, herbicides, molluscide, algicide, disinfectant, and as an ingredient in antifouling paint.

Until the mid-1980s, PCP (sodium pentachlorophenate) was also used in sawmills as a mildew/sap-stain control agent, and as an ingredient in consumer wood-preserving formulations, herbicides, and pesticides.

### *Assessment of Relevance to Wacker Siltronic Site*

Bridgewater Group reviewed Wacker Siltronic's chemical use files and found no records indicating that pentachlorophenol was ever used at the site.

As was discussed earlier, PCP was detected twice in 1988 in Wacker Siltronic's combined effluent. Subsequent sampling of the combined effluent over a period of three months did not detect any PCP. The combined effluent outfall is located at the far northwest corner of the property. Given the location of this outfall and the short period of time over which PCP was present in the discharge, it is unlikely that the combined effluent is the source of the PCP detected in sediments.

Soil samples collected by CH2M HILL in 1985 in the portion of the property where a polysilicon plant was proposed for construction found PCP to be present at 35- to 35.6-feet deep at MW-4, 10- to 11.5-feet deep at MW5, and 15- to 16.5-feet deep at MW-6 (CH2M HILL, 1985a). The detection of PCP at these depths is indicative of a historic source prior to the filling of the property. It does not appear that the PCP present in subsurface soils at these locations is the source of PCP in the Willamette River sediments, however, given that PCP was not detected,



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at a detection limit of 0.001 mg/L, in groundwater samples collected from the monitoring wells in 1985.

Therefore, it is Bridgewater Group's conclusion that no link exists between the PCP detected in Willamette River sediments and past or current operations conducted by Wacker Siltronic.

# Pesticides

2,4-D and 2,4-DB were detected above the harbor baseline value of <3.3 ug/kg at SD075 and SD077, the two sediment samples located at the upstream end of the property. The same two pesticides were detected at similar or higher concentrations in the two sediment samples collected upstream of the property: SD078 and SD080. DEQ's *Strategy Recommendation* states that " ....Due to the presence of the former presticide and herbicide manufacturer, Rhone-Poulenc upstream of the Wacker site, it does not appear that the presence of 2,4-D and 2,4-DB in Willamette River sediments is related to the Wacker site."

## *Chemical Background*

There are many forms or derivatives of 2,4-D including esters, amines, and salts. 2,4-D, a chlorinated phenoxy compound, functions as a systemic herbicide and is used to control many types of broadleaf weeds. It is used in cultivated agriculture, in pasture and rangeland applications, forest management, home, garden, and to control aquatic vegetation. It may be found in emulsion form, in aqueous solutions (salts), and as a dry compound. Commercial names for products containing 2,4-D include Aqua-Kleen, Barrage, Lawn-Keep, Malerbane, Planotox, Plantgard, Savage, Salvo, Weedone, and Weedtrine-II. The product Agent Orange, used extensively throughout Vietnam, was about 50% 2,4-D.

Traditionally, Rhone-Poulenc Ag. Co., has been a primary manufacturer of 2,4-D in the U.S.

2,4-DB is 4-(2,4-dichlorophenoxy)butyric acid. Trade names for products containing 2,4-DB include Butoxone, Butyrac, Butirex, Embutone, Embutox, and Venceweed. 2,4-DB may also be found in formulations with other herbicides such as cyanazine, MCPA, benazolin, linuron, and mecoprop.

2,4-DB is a selective systemic herbicide in the phenoxy family. It is used for the control of many annual and perennial broad-leaved weeds in alfalfa, peanuts, soybeans, and other crops. In the plant, the compound changes to 2,4-D and inhibits growth at the tips of stems and roots.

Traditionally, Rhone-Poulenc Ag. Co., has been a primary manufacturer of 2,4-DB in the U.S.



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### *Assessment of Relevance to Wacker Siltronic Site*

Based on review of Wacker Siltronic's records, Bridgewater Group is in agreement with DEQ. The only pesticide used on a regular basis by Wacker Siltronic is Roundup™. This emergent herbicide is used for brush control. It is applied by a licensed applicator service. Therefore, there is no link between the 2,4-D and 2,4-DB present in Willamette River sediments and past or current operations conducted by Wacker Siltronic.

# Phthalates

Bis(2-ethylhexyl)phthalate was detected at one sediment sampling location (i.e., SD075) at a concentration exceeding the harbor baseline value of 390 ug/kg. Bis(2-ethylhexyl)phthalate was not detected above the harbor baseline value immediately upstream or downstream of the property.

### *Chemical Background*

Di(2-ethylhexyl) phthalate (DEHP), commonly called bis (2-ethylhexyl) phthalate, is a colorless, oily liquid with a slight odor. Patented in 1933, it is primarily used as one of several plasticizers in polyvinyl chloride (PVC) resins for fabricating flexible vinyl products. These PVC resins have been used to manufacture teething rings, pacifiers, soft squeeze toys, balls, shower curtains, raincoats, adhesives, polymeric coatings, components of paper and paperboard, defoaming agents, enclosures for food containers, animal glue, surface lubricants, lead-acid battery separators, and other products that must stay flexible for their lifetime. It is also used to manufacture vinyl gloves used for medical examinations and surgery.

As a non-plasticizer, bis(2-ethylhexyl) phthalate is used as a replacement for polychlorinated biphenyls (PCBs) in dielectric fluids for electric capacitors and transformers. It is also used as a solvent in erasable ink, an acaricide for use in orchards, an inert ingredient in pesticides, a component of cosmetic products, vacuum pump oil; and it is used to detect leaks in respirators and to test air filtration systems.

### *Assessment of Relevance to Wacker Siltronic Site*

**DEQ's *Strategy Recommendation* states that Wacker Siltronic uses dioctylphthalate as a plasticizer. This is incorrect. According to Wacker Siltronic, no phthalates are used anywhere in the manufacturing process.**

In 1985, bis(2-ethylhexyl)phthalate was detected in groundwater at two locations (i.e., MW-2 and MW-4) on the portion of the property where a polysilicon plant was proposed for construction. According to North Creek Analytical laboratory, the bis(2-ethylhexyl)phthalate concentrations that were detected are trace levels that could easily be associated with cross-contamination from field sampling equipment or from sample



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handling in the laboratory. Thus, the bis(2-ethylhexyl)phthalate reportedly detected in groundwater may not have been present. Even if it was present, it does not appear to be the source of the bis(2-ethylhexyl)phthalate detected in Willamette River sediments. The monitoring of groundwater elevations between 1986 and 1998 in this area indicates that groundwater flow is to the southeast and east, away from the Willamette River. Bis(2-ethylhexyl)phthalate was not detected in groundwater in any of the four monitoring wells (i.e., MW-3, MW-5, MW-6 and MW-7) located downgradient from MW-2 and MW-4. Thus, the extent of bis(2-ethylhexyl)phthalate in groundwater, if it was present at all, was limited and it did not migrate offsite in groundwater.

It is important to note that sediment sample SD075 is located downstream of a City of Portland storm drain that discharges just downstream of the Railroad Bridge. Bis(2-ethylhexyl)phthalate is a constituent that is commonly found in sediments adjacent to stormwater discharges. Sampling conducted in 1995 at five stormwater discharge locations in the Willamette River found bis(2-ethylhexyl)phthalate to be present at each location (Port of Portland, 1998).

It is Bridgewater Group's conclusion is that there is no link between the bis(2-ethylhexyl)phthalate detected in one sediment sample and past or current operations conducted by Wacker Siltronic.



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Wacker Siltronic. December 15, 1995 letter to Laurie J. McCulloch DEQ regarding Wacker Siltronic Corporation Petroleum Contaminated Soil Closure Report from Thomas C. McCue, 1995b.





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**Table 1**
**Constituents Reported by DEQ to Exceed Apparent**
**Portland Harbor Baseline Sediment Values**

| Analyte | Downstream | | Adjacent to Wacker Siltronic Site | | | | | | | Upstream | | Harbor Baseline Maximum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SD065 | SD067 | SD068 | SD069 | SD070 | SD072 | SD072A | SD075 | SD077 | SD078 | SD080 | |
| Metals (mg/kg) | | | | | | | | | | | | |
| Beryllium | 0.7 | 0.7 | 0.65 | 0.7 | 0.7 | 0.6 | 0.6 | ***0.9*** | 0.7 | 0.5 | 0.7 | 0.7 |
| Cobalt | 19 | 17.8 | 18.2 | ***21.3*** | ***20.3*** | 18.4 | ***24.6*** | ***23.9*** | ***21.3*** | 15.4 | 18.3 | 19.7 |
| Iron | 43,100 | 43,800 | 44,100 | ***54,200*** | ***53,000*** | ***51,900*** | ***53,900*** | ***64,500*** | ***58,600*** | 41,400 | 44,200 | 45,000 |
| Manganese | 699 | 624 | 681 | 725 | 638 | 591 | ***863*** | ***909*** | 605 | 487 | 693 | 810 |
| Selenium | 11 | ***17*** | 12 | ***17*** | ***17*** | ***16*** | 14 | ***17*** | 14 | 11 | 14 | 15 |
| Silver | 1.0 | 1.2 | 1.2 | ***1.5*** | 1.4 | 1.3 | 1.3 | ***1.7*** | ***1.6*** | 1.0 | 1.2 | 1.4 |
| Titanium | NA | NA | NA | NA | ***2,840*** | ***2,740*** | ***2,850*** | NA | ***3,200*** | NA | NA | 2075 |
| Vanadium | 107 | ***113*** | 110 | ***136*** | ***132*** | ***125*** | ***136*** | ***152*** | ***147*** | 89.1 | 106 | 112 |
| Zinc | 104 | ***150*** | ***134*** | ***144*** | 117 | 113 | ***145*** | ***120*** | ***124*** | 100 | ***131*** | 118 |
| Organics (µg/kg) | | | | | | | | | | | | |
| 2-Methylnaphthalene | ***11,000*** | ***7,600*** | ***2,700*** | ***210*** | ***530*** | 130 | ***980*** | ***180*** | ***430*** | 24 | 19U | 150 |
| Bis(2-ethylhexyl)phthalate | 200U | 200U | 150 | 76 | 94U | 210 | 260 | ***700*** | 180U | 210 | 260 | 390 |
| Cabazole | ***3,600*** | ***1,800*** | ***1,700J*** | ***3,400J*** | ***2,000EJ*** | 86J | ***660*** | ***170J*** | ***700J*** | 40J | 19U | 100 |
| Dibenzofuran | ***1600*** | ***1300*** | ***700*** | ***1,900*** | ***2,600*** | ***220*** | ***3,600*** | ***340*** | ***160*** | 20 | 19U | 100 |
| Pentachlorophenol | 480UJ | 1,000U | 98UJ | 98UJ | 94UJ | 99UJ | 530U | ***7.1*** | ***6.4*** | ***4.6*** | ***11*** | Detect |
| LPAHs | ***165,600*** | ***112,400*** | ***60,430*** | ***65,680*** | ***70,574*** | ***4,995*** | ***31,500*** | ***13,490*** | ***6,860*** | 425 | 337 | 700 |
| HPAHs | ***268,800*** | ***192,000*** | ***89,800*** | ***58,390*** | ***46,990*** | ***8,630*** | ***18,860*** | ***15,260*** | ***9,060*** | ***3,034*** | 2,134 | 2,400 |
| 2,4-D | NA | NA | NA | NA | NA | NA | NA | ***9*** | ***24*** | ***21*** | ***93*** | <3.3 |
| 2,4-DB | NA | NA | NA | NA | NA | NA | NA | ***19*** | ***13*** | ***23*** | ***130*** | <5 |
| | | | | | | | | | | | | |

Notes: Analyte concentrations shown in ***bold italics*** exceed the apparent Portland Harbor Baseline maximum value for that analyte.

J = The analyte was positively identified and detected: however, the concentration in an estimated value because the result is less than the quantitation limit or quality control criteria were not met.

It should be noted that Table 1 of DEQ's *Strategy Recommendation* did not report the "J" data qualifier. Data in the DEQ table is represented as an actual concentration, when, in fact, it is an estimated concentration.



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**Table 2**
**Comparison of Metals Reported by DEQ to Exceed Apparent Portland Harbor Baseline Sediment Concentrations with Metals Concentrations Detected on Suspended in the Portland Harbor**

| Analyte | Adjacent to Wacker Siltronic Site | | | | | | | Concentration on Suspended Sediments in the Portland Harbor[a] | Concentration on Suspended Sediments in the Portland Harbor[b] |
|---|---|---|---|---|---|---|---|---|---|
| | SD068 | SD069 | SD070 | SD072 | SD07A | SD075 | SD077 | | |
| Metals (mg/kg) | | | | | | | | | |
| Beryllium | 0.65 | 0.7 | 0.7 | 0.6 | 0.6 | ***0.9*** | 0.7 | 1.1 – 3.0 | 1.1 – 1.6 |
| Cobalt | 18.2 | ***21.3*** | ***20.3*** | 18.4 | ***24.6*** | ***23.9*** | ***21.3*** | 21 – 32 | 22 -30 |
| Iron | 44,100 | ***54,200*** | ***53,000*** | ***51,900*** | ***53,000*** | ***64,500*** | ***58,900*** | 47,000 – 66,000 | 52,000 – 66,000 |
| Manganese | 681 | 725 | 638 | 591 | ***863*** | ***909*** | 605 | 1,300 – 4,100 | 800 – 3,700 |
| Selenium | 12 | ***17*** | ***17*** | ***16*** | 14 | ***17*** | 14 | 0.1 – 0.6 | 0.1 – 0.6 |
| Silver | 1.2 | ***1.5*** | 1.4 | 1.3 | 1.3 | ***1.7*** | ***1.6*** | <0.1 - <0.5 | <0.5 – 0.9 |
| Titanium | NA | NA | ***2,840*** | ***2,740*** | ***2,850*** | NA | 3,200 | 5,100 – 7,800 | 5,800 – 8,800 |
| Vanadium | 110 | ***136*** | ***132*** | ***125*** | ***136*** | ***152*** | ***147*** | 130 - 190 | 140 – 180 |
| Zinc | ***134*** | ***144*** | 117 | 113 | ***145*** | 120 | ***124*** | 120 - 180 | 38 – 250 |

Notes: Analyte concentrations shown in ***bold italics*** exceed the apparent Portland Harbor Baseline maximum value for that analyte.

[a] Metal concentrations measured by the USGS at the Willamette River at Portland gaging station (USGS, 1995, 1996, 1998)

b Metal concentrations measured by the USGS at the Willamette River at Portland gaging station, unpublished data for 1995 through 1996 provided by Chauncey Anderson

NA = Not analyzed

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**Table 3**
**Comparison of Sediment Sample Results Collected Near the Wacker Siltronic Site to Potential Source Chemicals**

| Constituent | SD068 (%) | SD069 (%) | SD070 (%) | SD072 (%)[a] | SD072A (%) | SD075 (%) | SD077 (%) | No.2 Diesel and Fuel Oil (%)[a] | Creosote (%)[b] | Coal Tar (%)[c] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semivolatile Organics** | | | | | | | | | | |
| 2-Methylnaphthalene | 0.00027 | 0.000021 | 0.000053 | 0.000013 | 0.000098 | 0.000018 | 0.000043 | 0.68-0.89 | 1-6 | 1.4 |
| Carbazole | 0.00017 | 0.00034 | 0.00020 | 0.0000086J | 0.000066 | 0.000017J | 0.00007J | - | ✓ | 1.5 |
| Dibenzofuran | 0.000070 | 0.00019 | 0.00026 | 0.000022 | 0.00036 | 0.000034 | 0.000016 | - | ✓ | 1.0 |
| **LPAHs** | | | | | | | | | | |
| Naphthalene | 0.000079 | 0.000020 | 0.000051 | 0.000021 | 0.000020 | 0.000035 | 0.00003 | 0.026-0.22 | 1-6 | 10 |
| Acenaphthylene | 0.000074 | 0.000018 | 0.0000064 | 0.0000085 | 0.0000011U | 0.000014 | 0.000014 | 0.006 | ✓ | ✚ |
| Acenaphthene | 0.0015D | 0.00056D | 0.0011D | 0.00015 | 0.00072 | 0.00038D | 0.00024D | 0.018 | 1-6 | 1.4 |
| Fluorene | 0.00049D | 0.00067D | 0.0011D | 0.000096 | 0.00050 | 0.00024D | 0.00014 | 0.086 | ✓ | 2.0 |
| Phenanthrene | 0.0033D | 0.0031D | 0.0040D | 0.00018D | 0.0016D | 0.00055D | 0.00022 | 0.079-0.088 | 5-13 | 5.3 |
| Anthracene | 0.00060D | 0.0022D | 0.0008D | 0.000044 | 0.00031 | 0.00013 | 0.000042 | 0.0028-0.0058 | 1-5 | 1.8 |
| **HPAHs** | | | | | | | | | | |
| Fluoranthene | 0.0020D | 0.0022D | 0.0019D | 0.00015D | 0.00072D | 0.00035D | 0.00017D | 0.0014-0.0059 | ✓ | 3.3 |
| Pyrene | 0.0026D | 0.0017D | 0.0017D | 0.00016D | 0.00066 | 0.00033D | 0.00025D | 0.0029-0.0046 | ✓ | 2.1 |
| Benzo(a)anthracene | 0.00063D | 0.00048D | 0.00029D | 0.00007 | 0.00011 | 0.00015 | 0.000074 | 0.000045-0.000096 | ✓ | ✚ |
| Chrysene | 0.00086D | 0.00063D | 0.00032D | 0.00011 | 0.00015 | 0.00017D | 0.000092 | 0.000045-0.00014 | ✓ | 2.0 |
| Benzo(b)fluoranthene | 0.00039D | 0.00019D | 0.00011D | 0.00008 | 0.000046 | 0.00011 | 0.000070 | 0.000031 | ✓ | ✚ |
| Benzo(k)fluoranthene | 0.00054D | 0.00014 | 0.00012 | 0.000063 | 0.000069 | 0.00011 | 0.000067 | Reported with Benzo(b)fluoranthene | ✓ | ✚ |
| Benzo(a)pyrene | 0.00080D | 0.00024D | 0.00014 | 0.000098 | 0.000066 | 0.00013 | 0.000089 | 0.000021-0.00022 | ✓ | ✚ |
| Indeno(1,2,3-cd)pyrene | 0.00042D | 0.00011 | 0.000052 | 0.000056 | 0.000031 | 0.000073 | 0.000038 | 0.000016 | ✓ | ✚ |
| Dibenz(a,h)anthracene | 0.00015 | 0.000039 | 0.000021 | 0.000016 | 0.000011U | 0.000022 | 0.000014 | - | ✓ | ✚ |
| Benzo(g,h,I)perylene | 0.00059DJ | 0.00011 | 0.000046 | 0.000060 | 0.000034 | 0.000081 | 0.000042J | 0.0000057-0.000012 | ✓ | ✚ |

[a]From *Composition of Petroleum Mixtures – Volume 2*, Total Petroleum Hydrocarbon Criteria Working Group, May 1998.

[b]From material safety data sheet (MSDS), Reilly Industries, P2 Creosote Solution, July 1995. ✓ denotes that constituent was listed on MSDS, but percent composition was not listed.

[c]Chemical Process Industries, R. Norris Shreve, McGraw-Hill Book Company, 3rd Ed, 1967. ✚ denotes that constituent is present but percent composition not listed.

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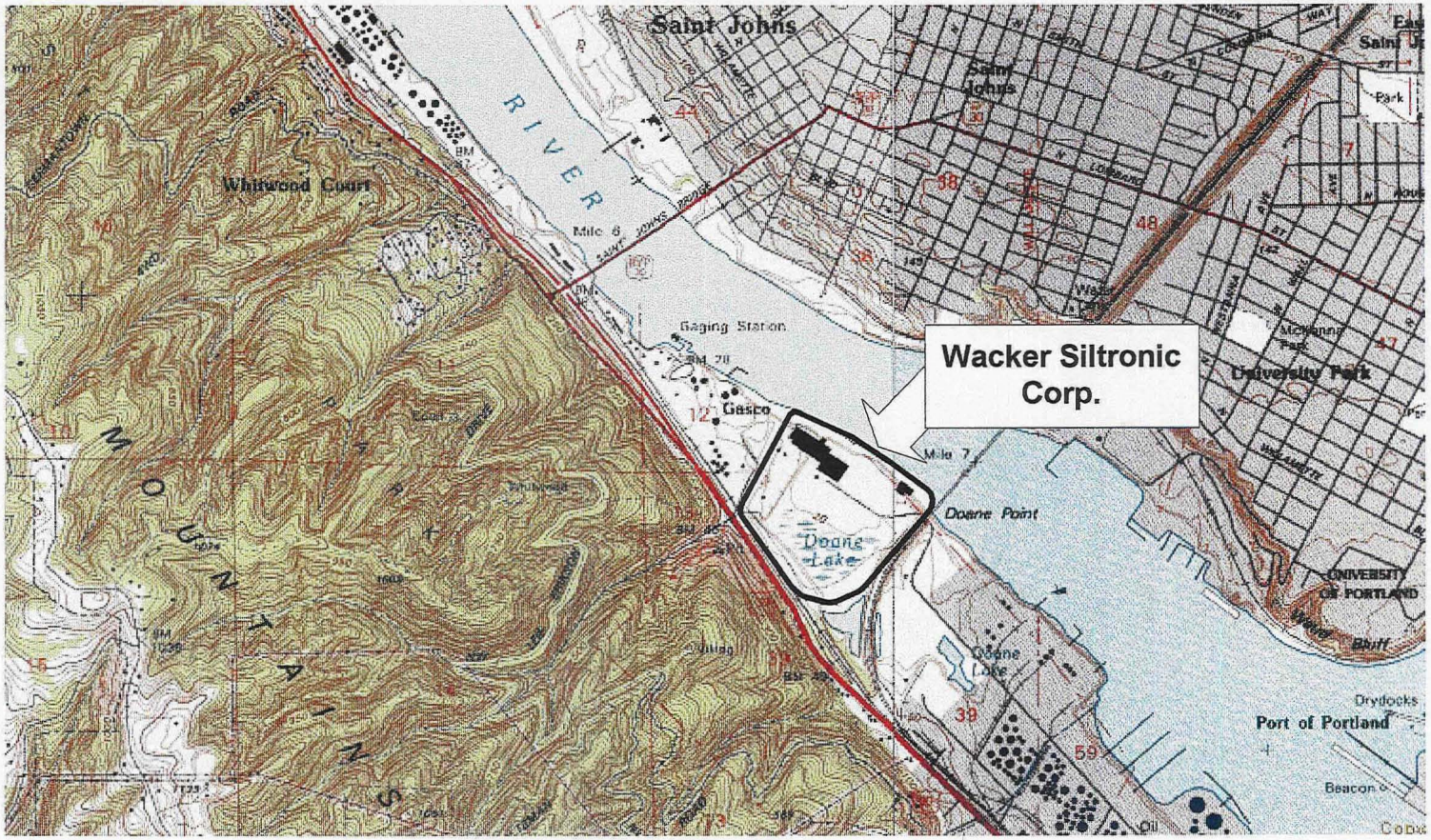


Source: USGS, Linnton and Portland Quadrangles (1990)

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Approximate Scale: 1" = 2325'

**Figure 1**
Location Map
Wacker Siltronic Corp.

BRIDGEWATER GROUP, INC.

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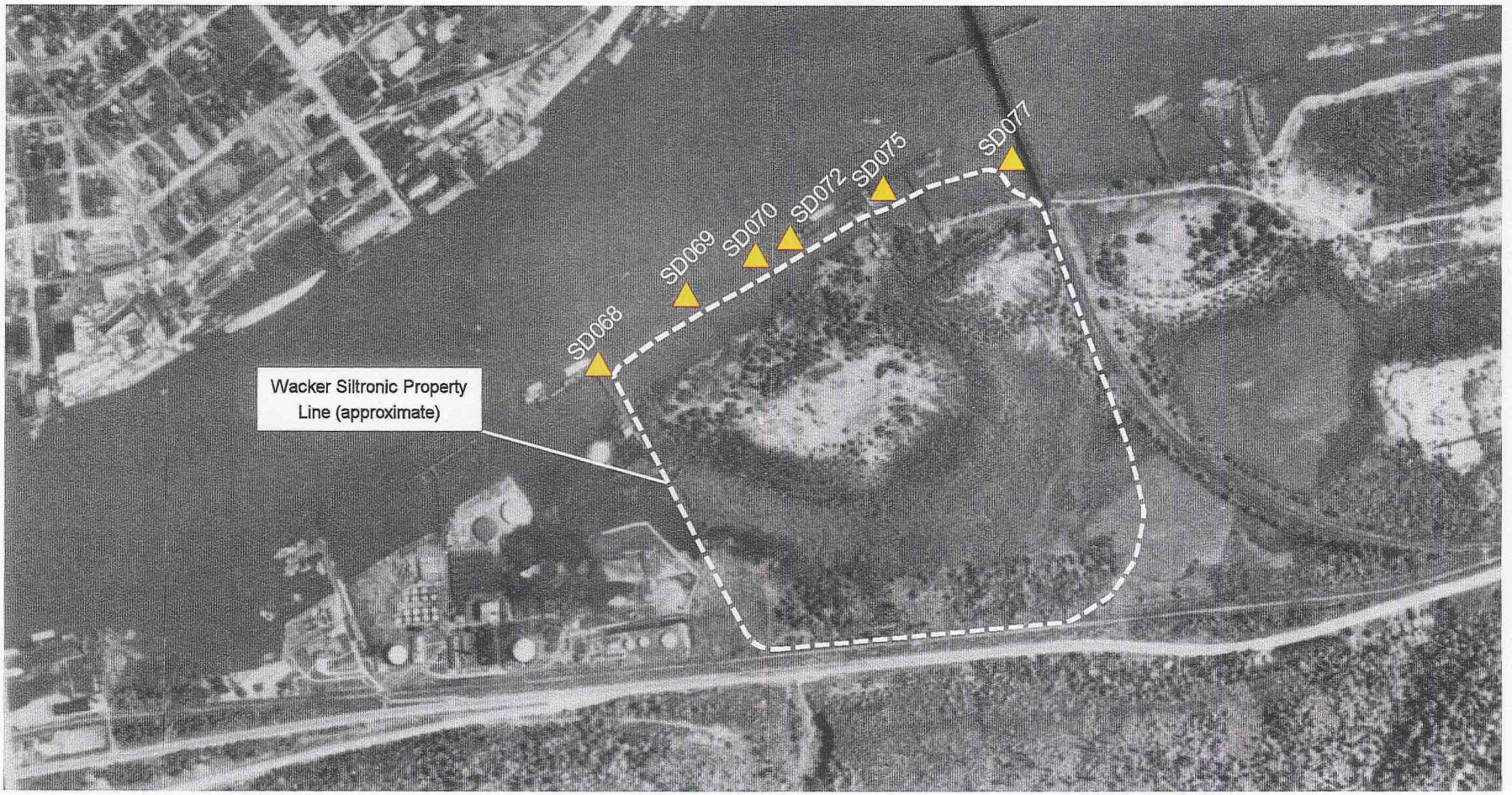


Approximate Location of EPA Sediment Sample Station (SDxxx)

Approximate Scale: 1 inch = 600 feet

**Figure 2**
Historical Aerial Photograph
May 1936

BRIDGEWATER GROUP, INC.

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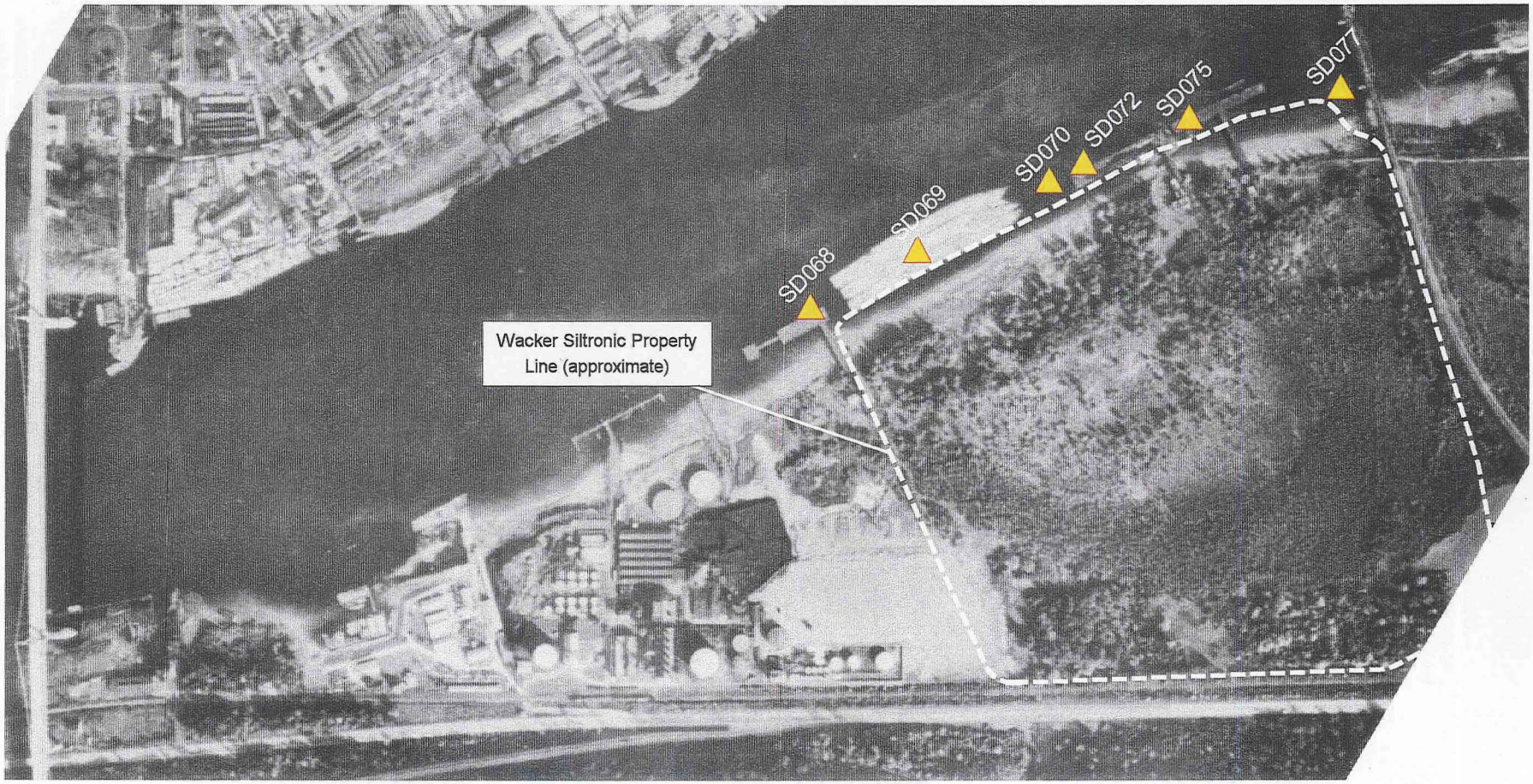


Approximate Location of EPA Sediment Sample Station (SDxxx)

Approximate Scale: 1 inch = 600 feet

**Figure 3**
Historical Aerial Photograph
October 1940

BRIDGEWATER GROUP, INC.

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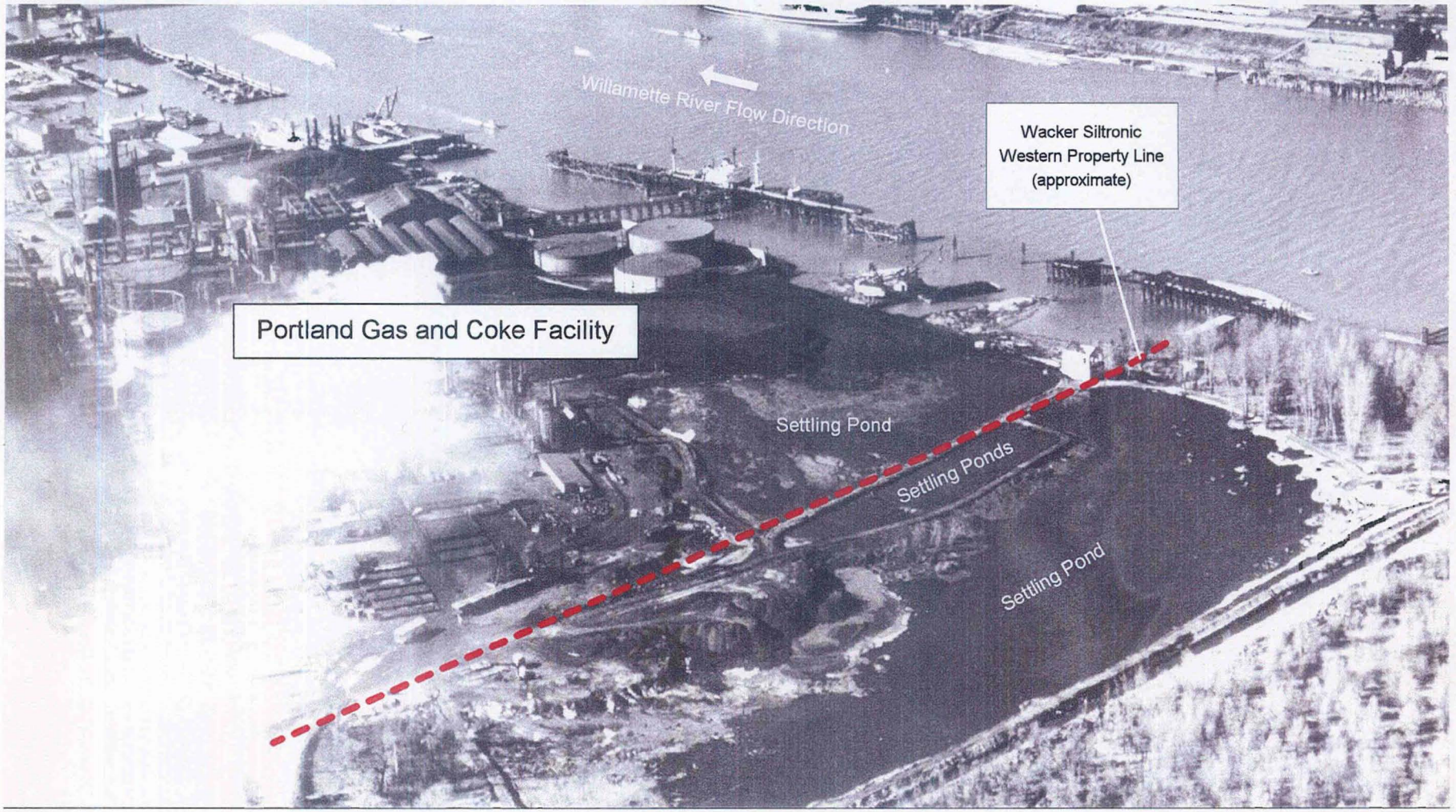


**Figure 4**
Historical Aerial Photograph
April 1952

BRIDGEWATER GROUP, INC.

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**Figure 5**
Historical Aerial Photograph
March 1955

BRIDGEWATER GROUP, INC.

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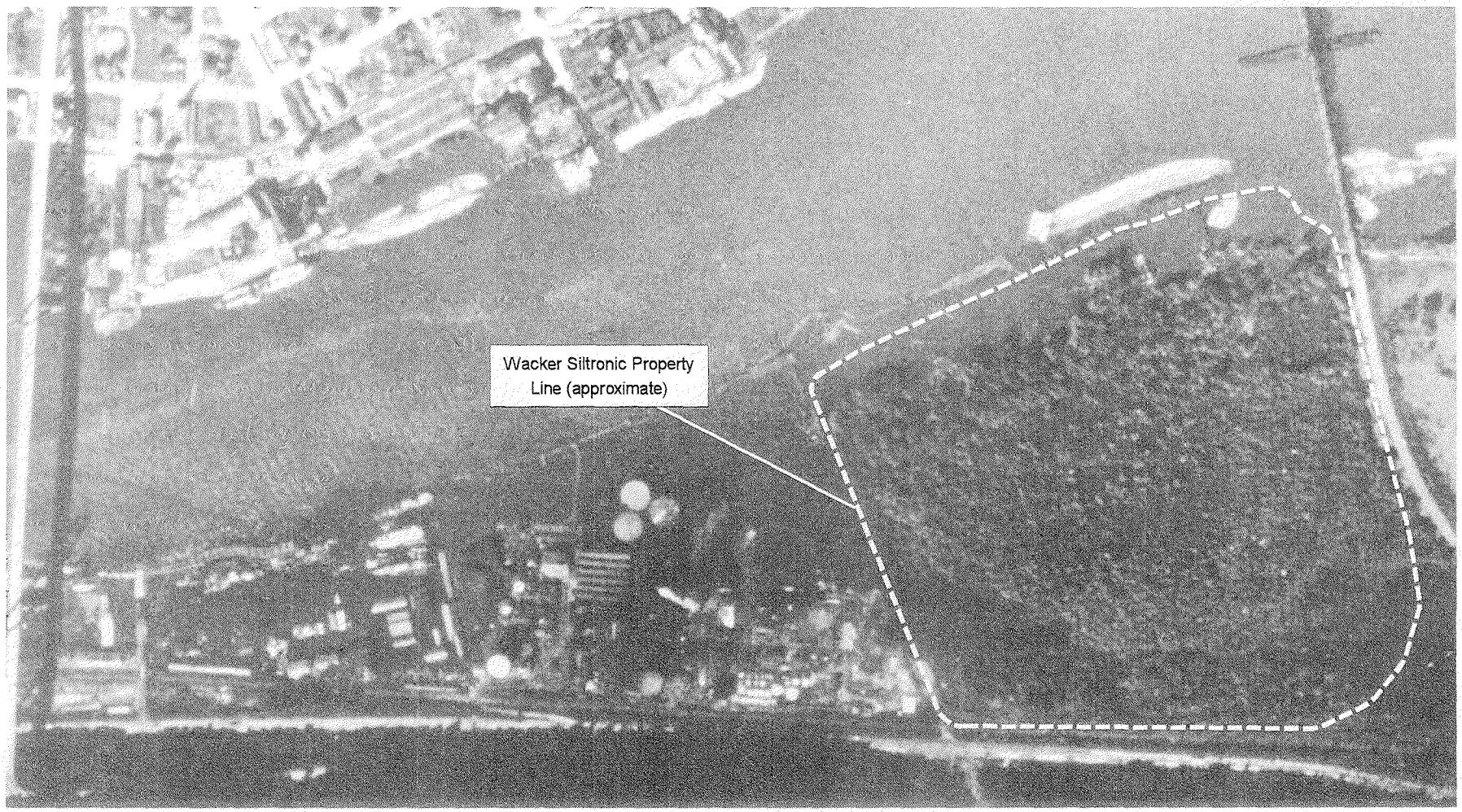


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Approximate Scale: 1 inch = 600 feet

**Figure 6**
Historical Aerial Photograph
June 1948 Flood

BRIDGEWATER GROUP, INC.

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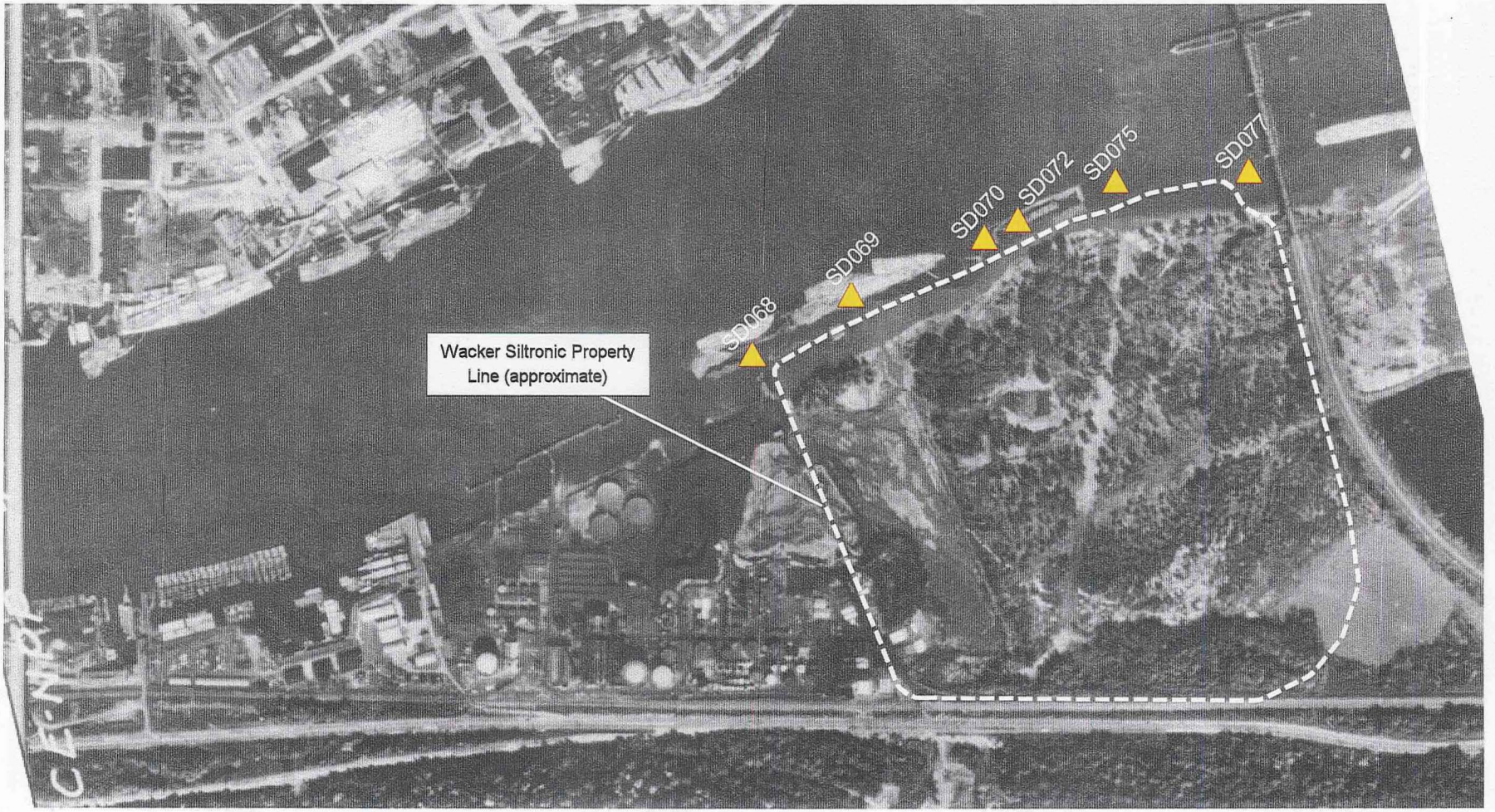



▲ Approximate Location of EPA Sediment Sample Station (SDxxx)

Approximate Scale: 1 inch = 600 feet

**Figure 7**
Historical Aerial Photograph
May 1957

BRIDGEWATER GROUP, INC.

SCOEPA00010172

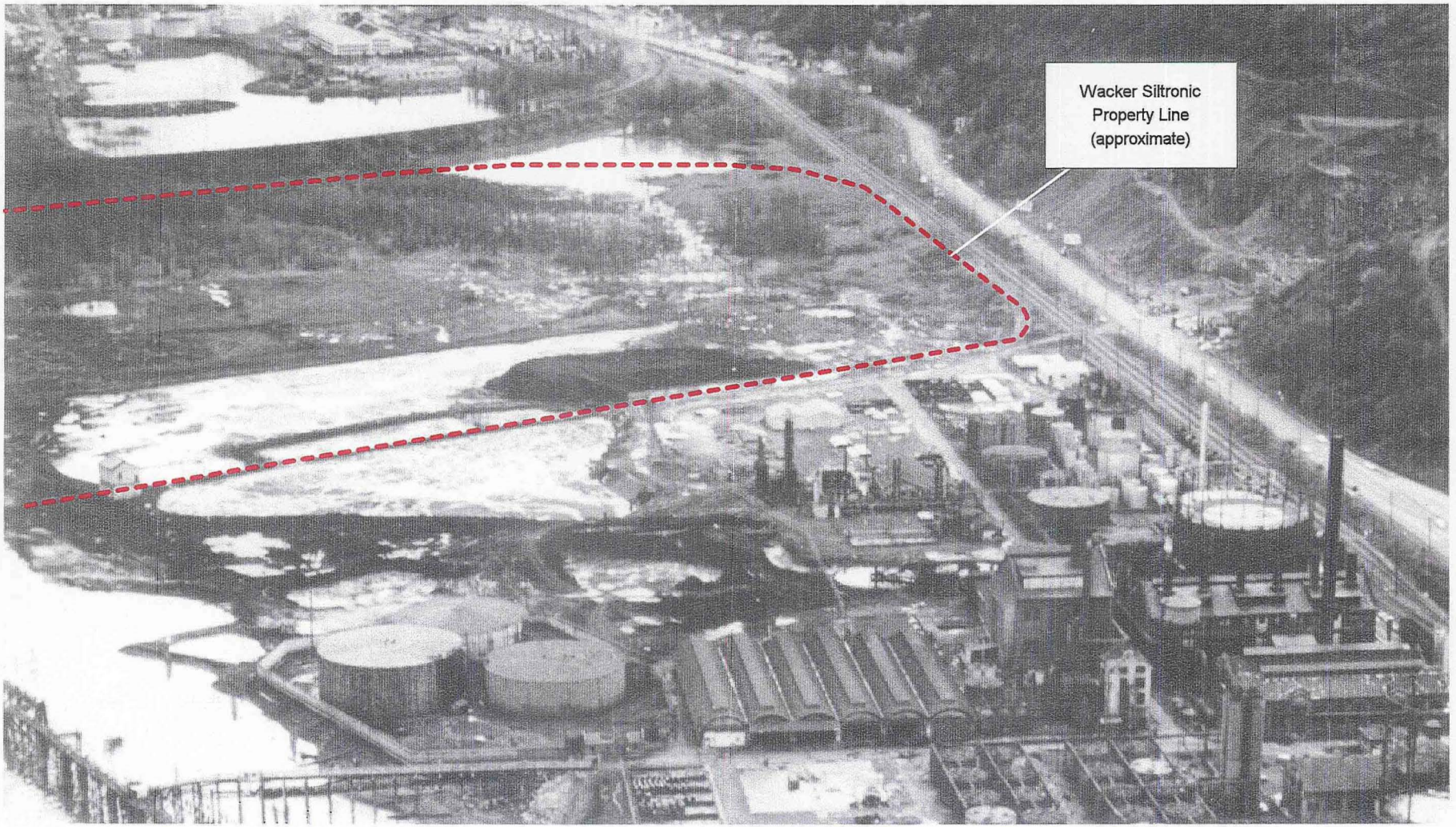
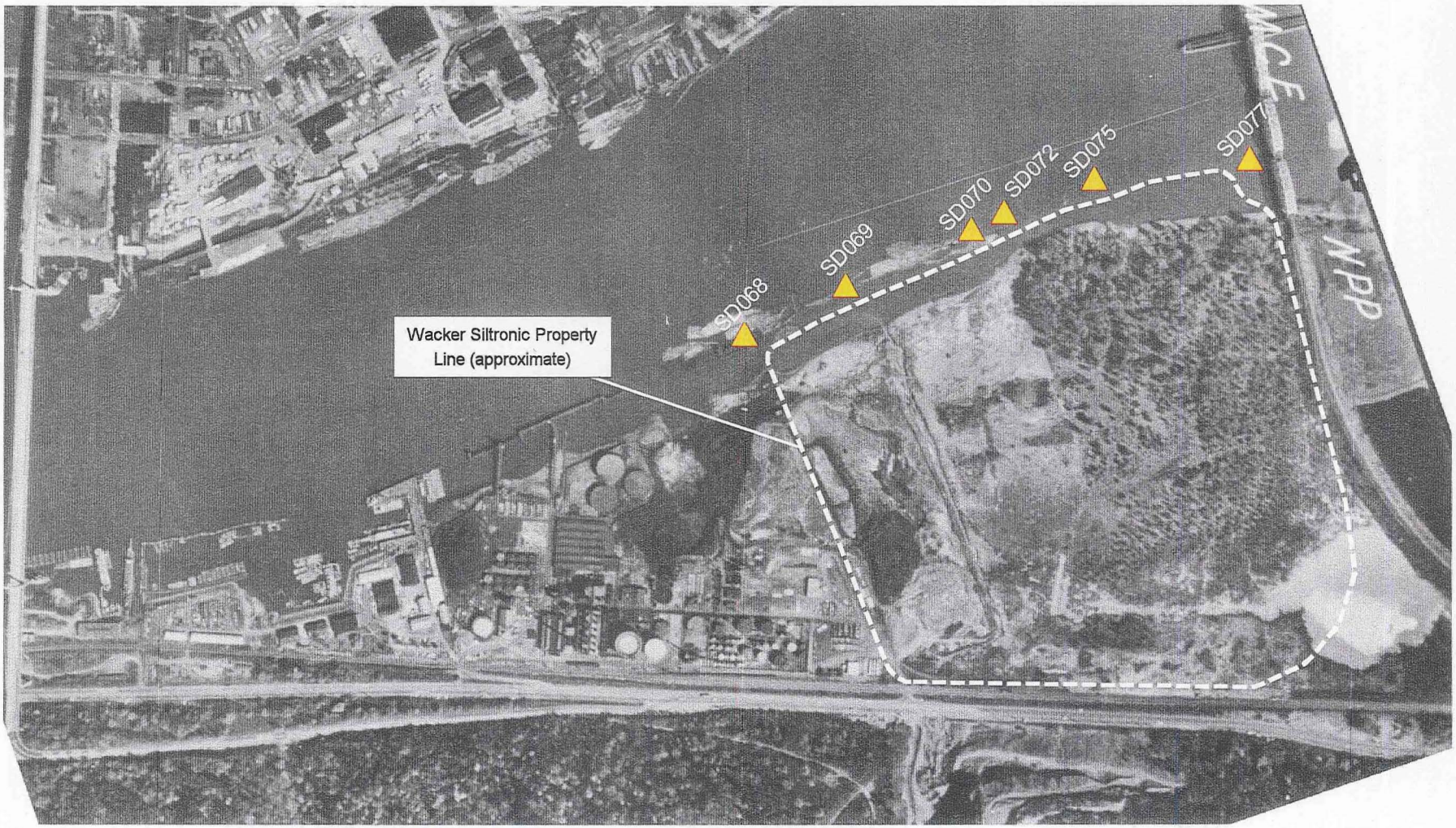



**Figure 8**
Historical Aerial Photograph
March 1961

BRIDGEWATER GROUP, INC.

SCOEPA00010173




Approximate Location of EPA Sediment Sample Station (SDxxx)

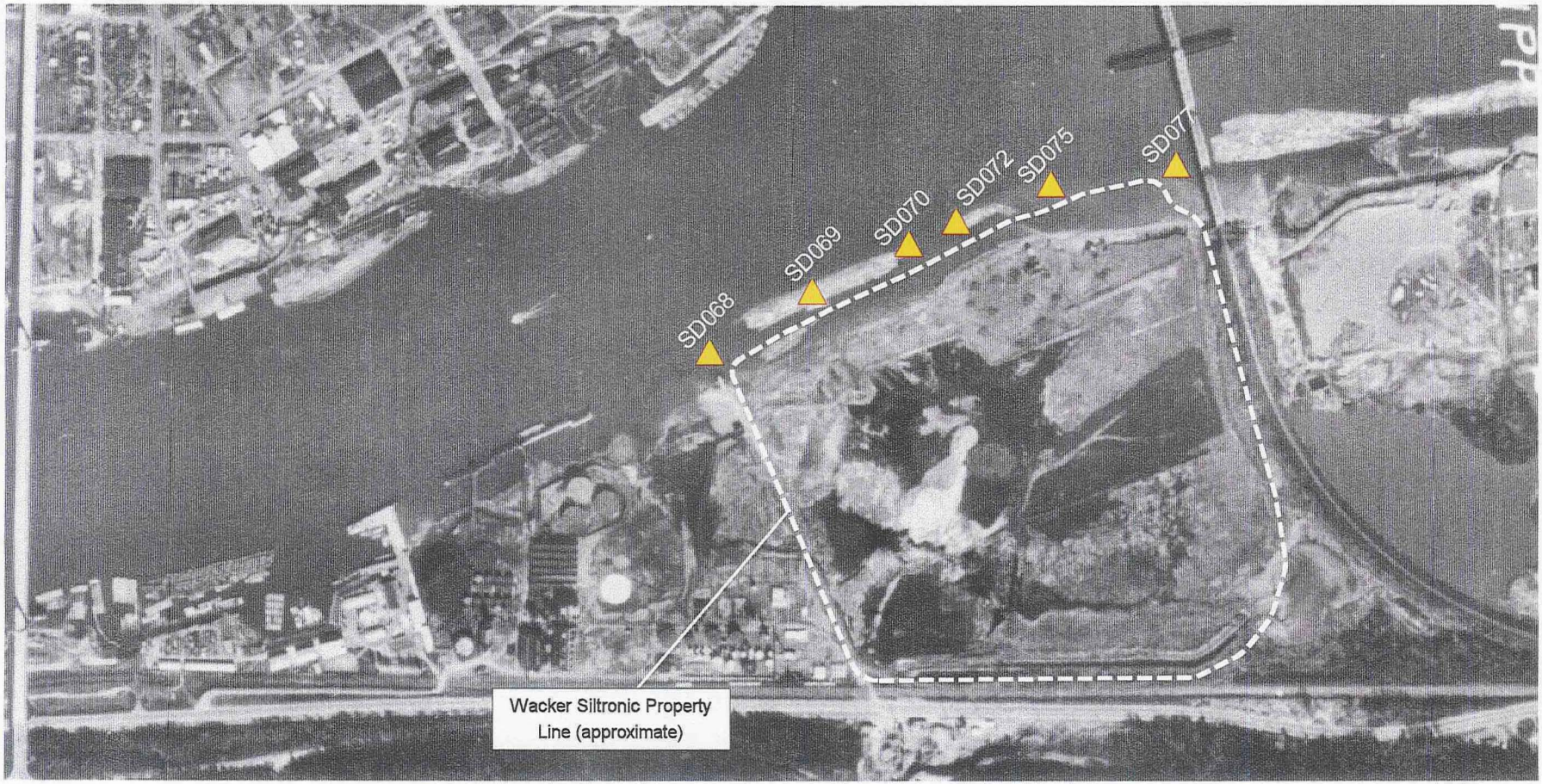
N

Approximate Scale: 1 inch = 600 feet

**Figure 9**
Historical Aerial Photograph
April 1961

BRIDGEWATER GROUP, INC.

SCOEPA00010174



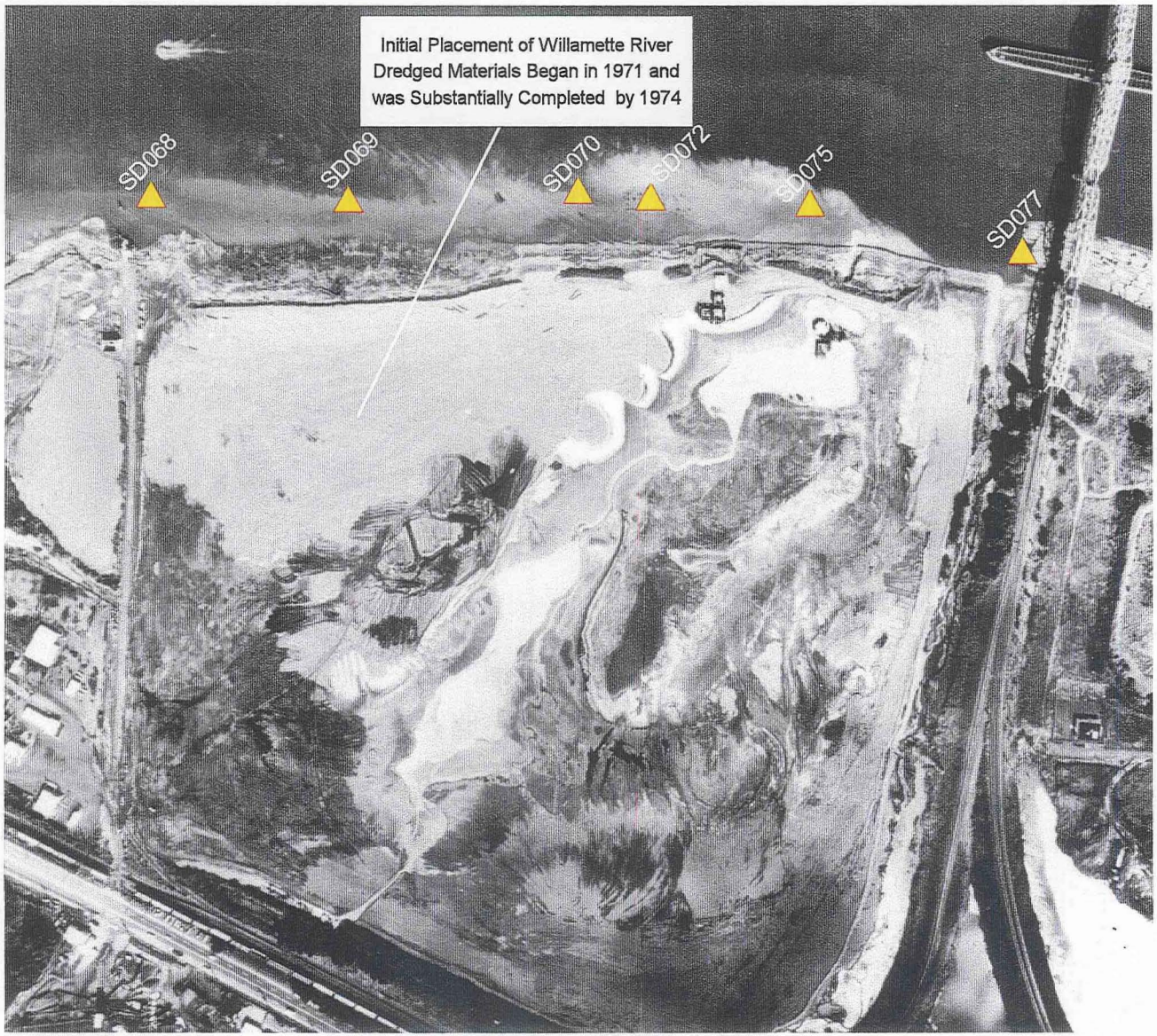

Approximate Location of EPA Sediment Sample Station (SDxxx)

Approximate Scale: 1 inch = 600 feet

**Figure 10**
Historical Aerial Photograph
April 1967

BRIDGEWATER GROUP, INC.

SCOEPA00010175




Approximate Location of EPA Sediment Sample Station (SDxxx)

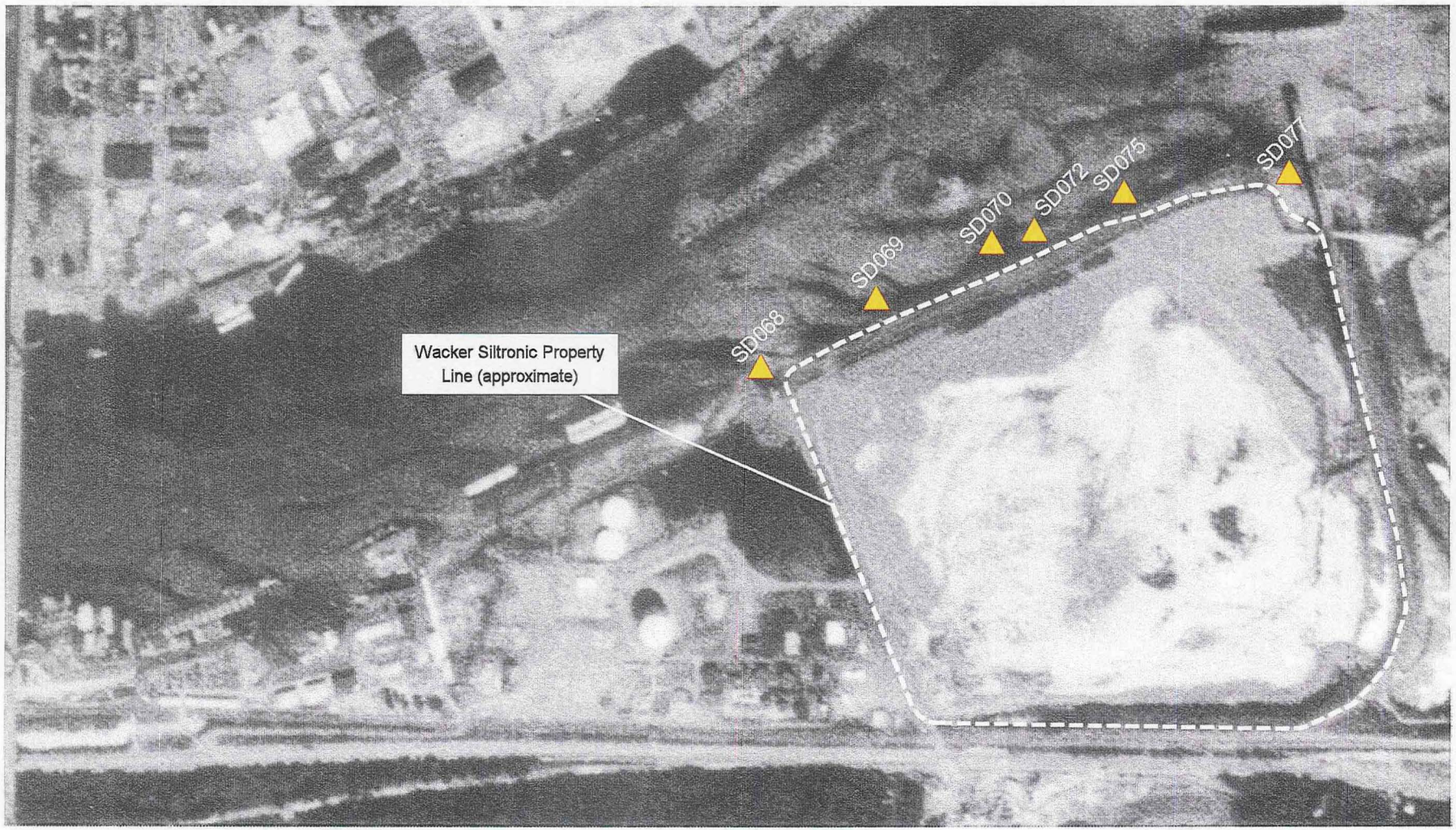
N

Approximate Scale: 1 inch = 420 feet

**Figure 11**
Historical Aerial Photograph
1971

BRIDGEWATER GROUP, INC.

SCOEPA00010176



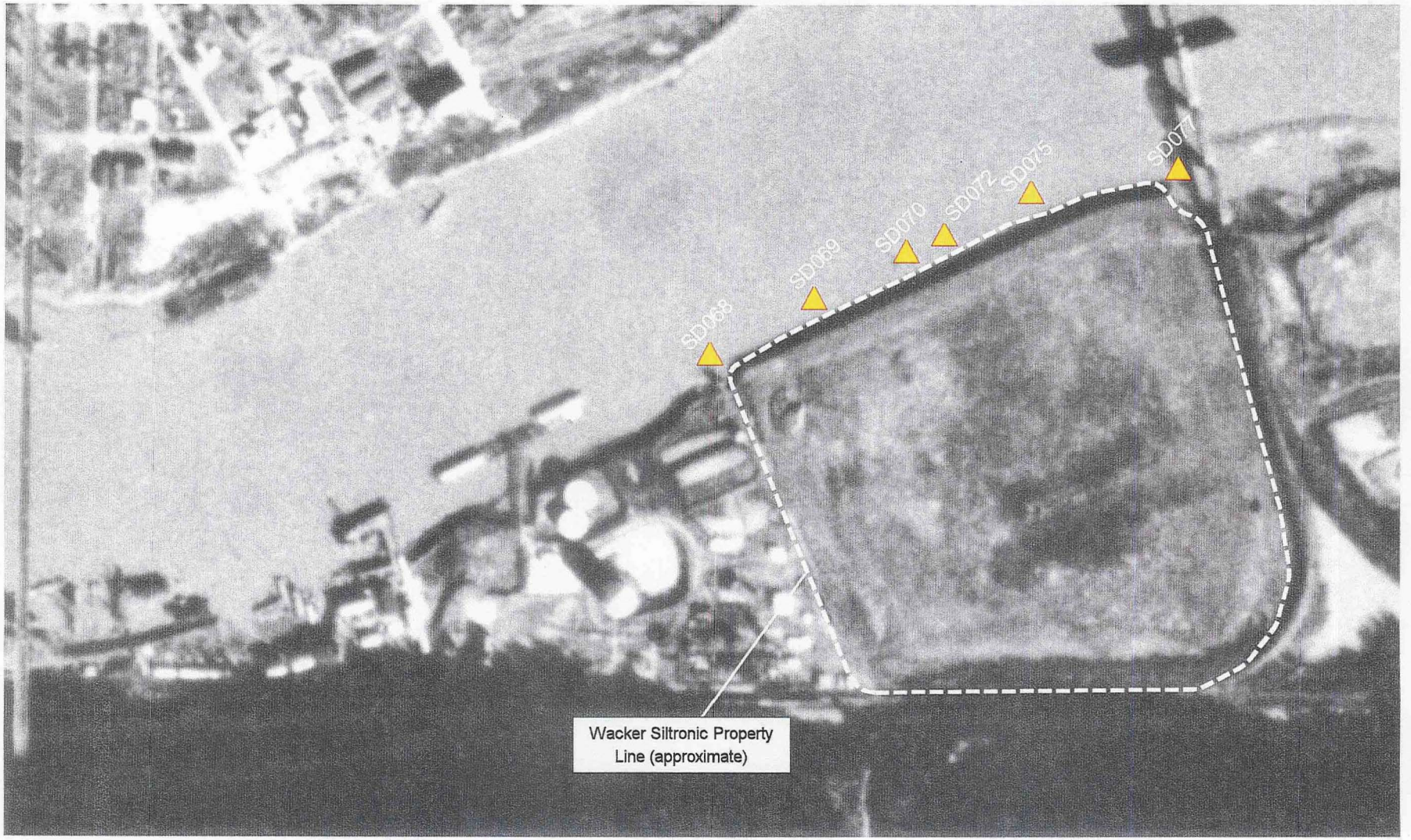

Approximate Location of EPA Sediment Sample Station (SDxxx)

Approximate Scale: 1 inch = 600 feet

**Figure 12**
Historical Aerial Photograph
August 1973

BRIDGEWATER GROUP, INC.

SCOEPA00010177




Approximate Location of EPA Sediment Sample Station (SDxxx)

N

Approximate Scale: 1 inch = 600 feet

**Figure 13**
Historical Aerial Photograph
December 1977

BRIDGEWATER GROUP, INC.

SCOEPA00010178

**Figure 14**
Historical Aerial Photograph
October 1978

BRIDGEWATER GROUP, INC.

SCOEPA00010179

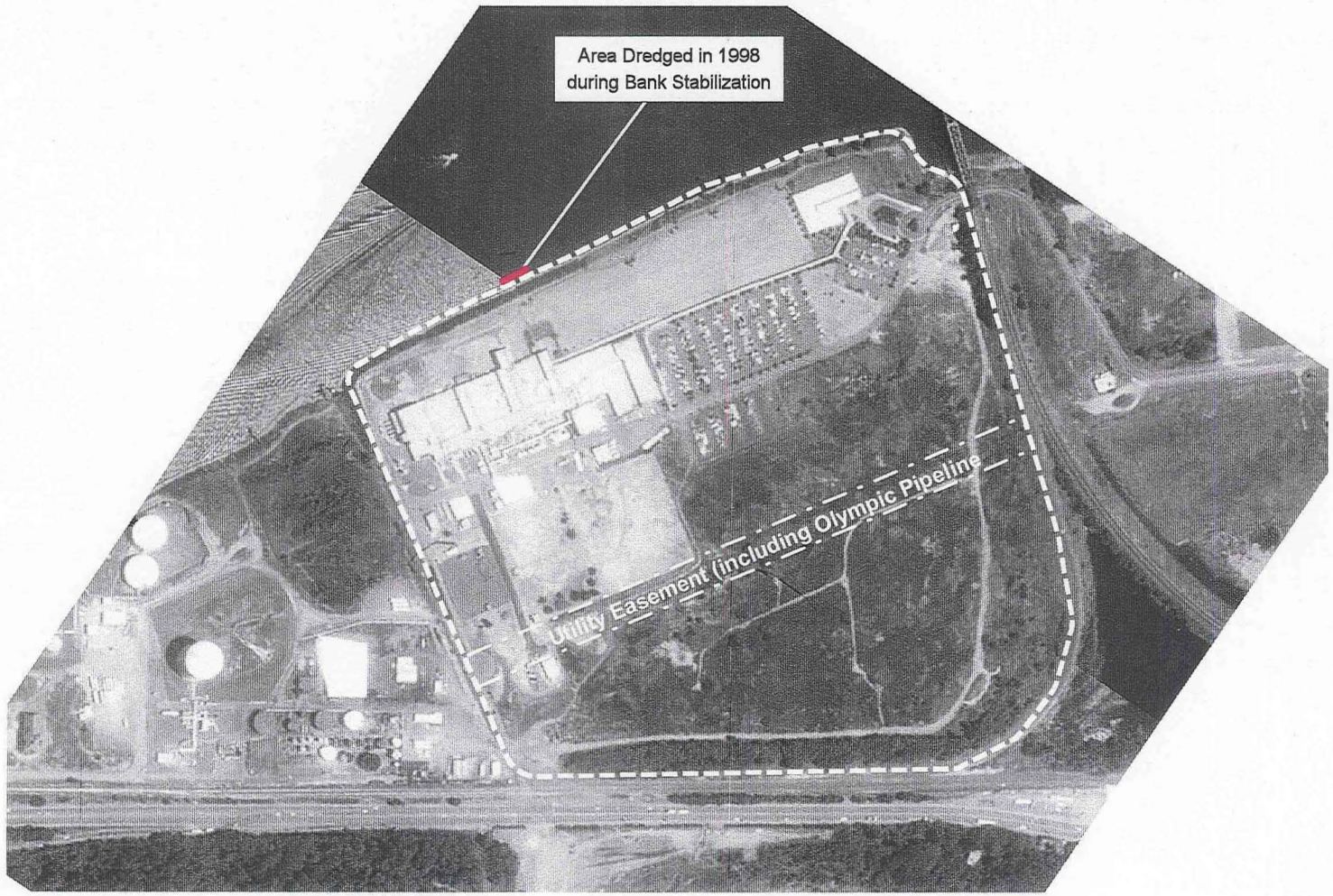
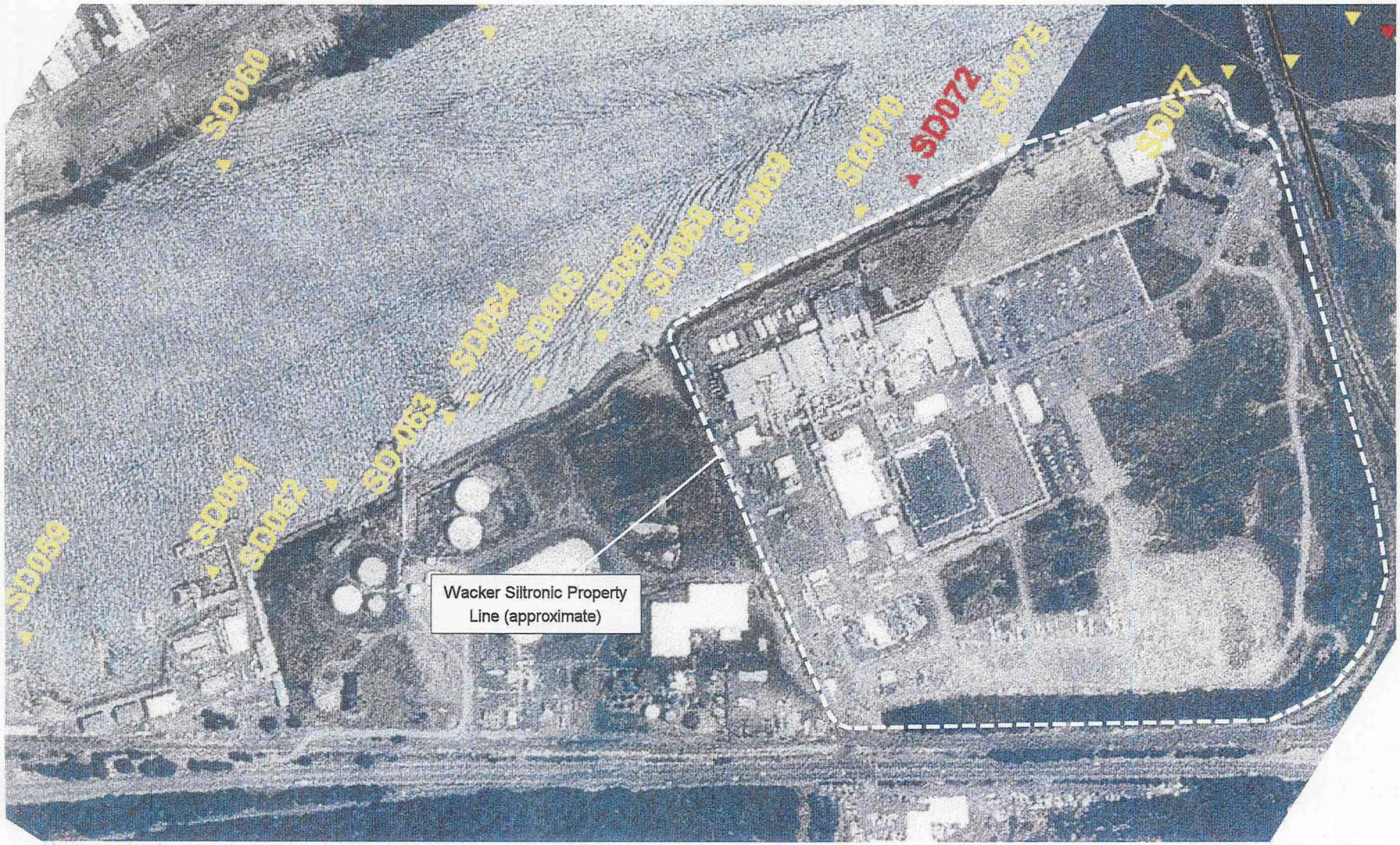



**Figure 15**
Historical Aerial Photo
September 1993

BRIDGEWATER GROUP, INC.

SCOEPA00010180




Source: EPA, May 1998

**Figure 16**
Sediment Sample Locations
Portland Harbor Sediment Investigation

BRIDGEWATER GROUP, INC.

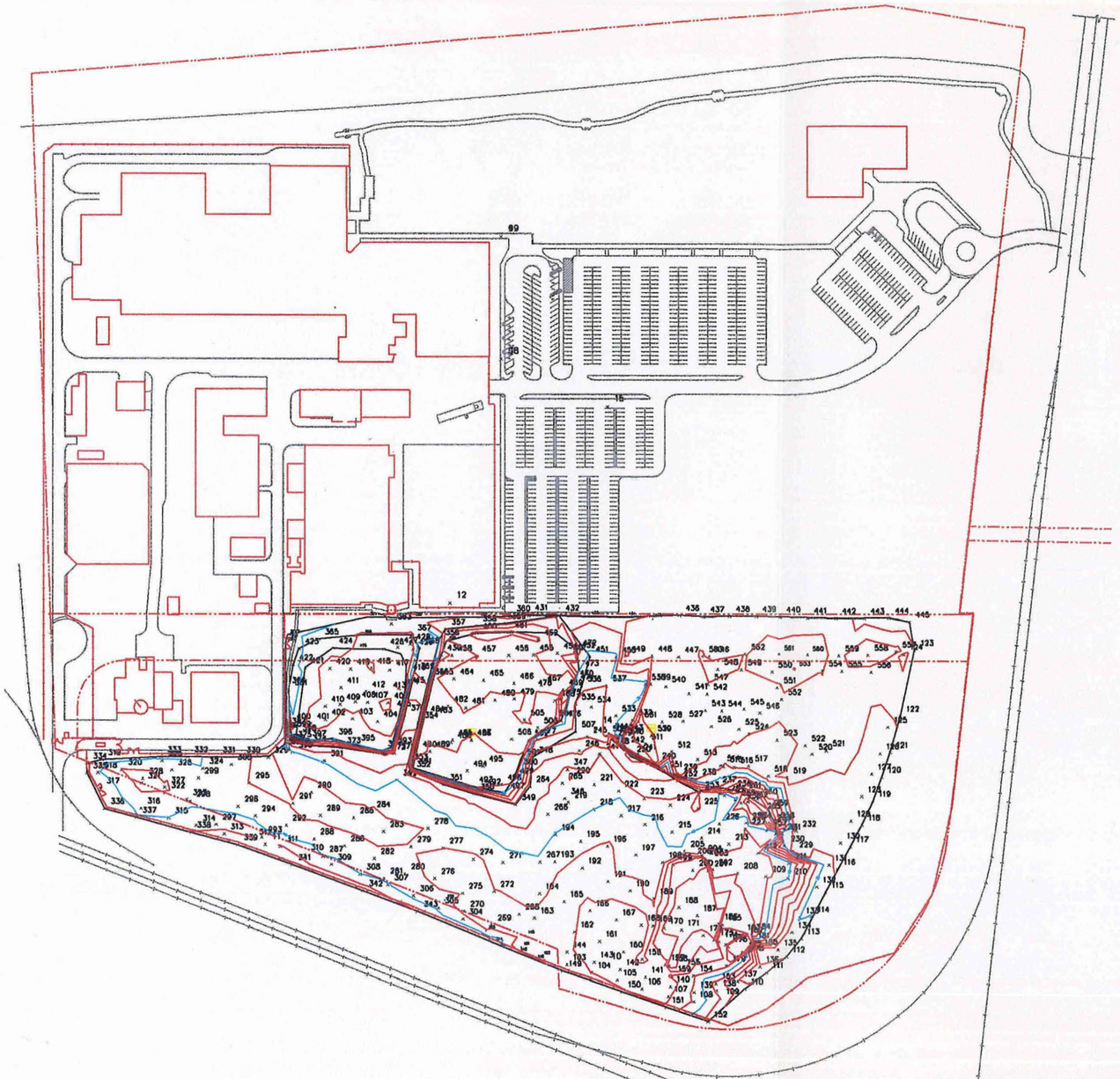
SCOEPA00010181

# APPENDIX A

SCOEPA00010182

# APPENDIX A – SITE GRADING PLAN

03/13/00



# Site Grading Plan

38

WACKER
Wacker Siltronic Corporation

March 13, 2002 ER:010 MWB

Mr. Rob Ede
Hahn and Associates, Inc.
434 NW 6th Avenue, Suite 203
Portland, OR 97209-3600

RE: Supplemental QC data for Catch Basin Sampling

Dear Rob:

Enclosed please find the supplemental QC data for the catch basin sampling that you recently requested. If you have any questions, please contact me at (503) 219-7832.

Sincerely,

WACKER SILTRONIC CORPORATION

Myron Burr, P.E.
Environmental Engineer

Enclosure:
(1) Supplemental QC data for catch basin sampling

C: Cathryn Young, WSC: w/o attachments

Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, OR 97210-3676
Phone (503) 243-2020
TDD (503) 241-7519

A QS-9000 and ISO 14001 Certified Corporation

**Analytical Results for**
**Wacker Siltronic**
**Project Name: None Provided**
**Project Number: 01-71-72**
**Report Date: March 5, 2002**
**Job Number: A10621BI**

**Analytical Results Prepared By:**
**Coffey Laboratories, Inc.**
**12423 NE Whitaker Way**
**Portland, OR 97230**
**(503) 254-1794**
**(503) 254-1452 FAX**

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**Coffey Laboratories, Inc.**
12423 N.E. Whitaker Way • Portland, OR • 97230 • (503) 254-1794 • FAX (503) 254-1452

**Analytical Narrative**

**Coffey Laboratories, Inc.**
12423 N.E. Whitaker Way • Portland, OR • 97230 • (503) 254-1794 • FAX (503) 254-1452

Report Date: March 5, 2002
Job Number: A10621BI
PO Number: 4500075102
Project No: 01-71-72
Project Name: None Provided

Tom Rothschild
Wacker Siltronic
7200 NW Front Avenue
Portland, OR 97210-3676

**Analytical Narrative**

The sample was received on 06/21/01 by Coffey Laboratories, Inc. (CLI) Sample Reception personnel under strict chain of custody protocol. The following information was provided at the time of sample reception:

| Laboratory Sample ID | Field Identification | Matrix | Collection Date | Collection Time |
|---|---|---|---|---|
| A10621BI-1 | 01-71a Catch Basin | Soil | 06/19/01 | 1400 |
| A10621BI-2 | 01-71b Catch Basin | Soil | 06/19/01 | 1400 |
| A10621BI-3 | CLI Composite 1-2 | Soil | 06/19/01 | COMP |
| A10621BI-4 | 01-72 Blank field sample | Water | 06/19/01 | 1400 |

The recommended holding time for each batch of analyses was in accordance with the data quality objectives as specified in the CLI Quality Assurance Plan unless otherwise noted.

Acceptable precision and accuracy were achieved for all analyses associated with this work order as demonstrated by the recoveries of the quality control samples analyzed concurrently with each batch.

The data submitted in this report is for the sole and exclusive use of the above-named client. All samples associated with the work order will be retained a maximum of 15 days from the report date or until the maximum holding time expires. All results pertain only to samples submitted.

Thank you for allowing Coffey Laboratories to be of service to you. If you have questions or need further assistance, please do not hesitate to call our Customer Services Department.

Sincerely,

Technical Services

TS /atc

**Analytical Results**

**Coffey Laboratories, Inc.**
12423 N.E. Whitaker Way • Portland, OR • 97230 • (503) 254-1794 • FAX (503) 254-1452

## Analytical Data

Wacker Siltronic

Job Number: A10621BI
Page Number: 1 of 20

Lab Sample ID: A10621BI-3
Field ID: CLI Composite 1-2
Date/Time: 06/19/01 COMP
Matrix: Soil

EPA Category: Conventional Parameters

| Parameter | Method | Detection Limit | Analytical Result | Units |
|---|---|---|---|---|
| Total Organic Carbon | EPA 415.1 | 0.8 | 13000. E | mg/Kg |
| Total Cyanide | EPA 9010 | 0.25 | 0.4 | mg/Kg |

E means Estimated Concentration

**Coffey Laboratories, Inc.**
12423 N.E. Whitaker Way • Portland, OR • 97230 • (503) 254-1794 • FAX (503) 254-1452

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-3
Field ID: CLI Composite 1-2
Date/Time: 06/19/01 COMP
Matrix: Soil

EPA Category: Metals

| Parameter | Method | Detection Limit | Analytical Result | Units |
|---|---|---|---|---|
| Antimony | EPA 6020 | 0.5 | ND | mg/Kg |
| Arsenic | EPA 6020 | 0.25 | 1.1 | mg/Kg |
| Barium | EPA 6020 | 0.05 | 46. | mg/Kg |
| Cadmium | EPA 6020 | 0.1 | 0.55 | mg/Kg |
| Chromium | EPA 6020 | 0.5 | 13. | mg/Kg |
| Cobalt | EPA 6020 | 0.05 | 4.4 | mg/Kg |
| Copper | EPA 6020 | 0.25 | 32. | mg/Kg |
| Iron | EPA 6010 | 25 | 10000. | mg/Kg |
| Lead | EPA 6020 | 0.1 | 16. | mg/Kg |
| Magnesium | EPA 6010 | 2.5 | 1400. | mg/Kg |
| Manganese | EPA 6010 | 5.0 | 110. | mg/Kg |
| Mercury | EPA 7471 | 0.01 | 0.02 | mg/Kg |
| Nickel | EPA 6020 | 0.25 | 8.3 | mg/Kg |
| Selenium | EPA 6020 | 0.5 | ND | mg/Kg |
| Silver | EPA 6020 | 0.1 | 1.3 | mg/Kg |
| Thallium | EPA 6020 | 0.05 | ND | mg/Kg |
| Titanium | EPA 6020 | 10. | 430. | mg/Kg |
| Vanadium | EPA 6020 | 0.05 | 25. | mg/Kg |
| Zinc | EPA 6020 | 5. | 360. | mg/Kg |

ND means none detected at or above the detection limit listed.



SCOEPA00010193

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-3
Field ID: CLI Composite 1-2
Date/Time: 06/19/01 COMP
Matrix: Soil

EPA Category: Volatile Organics
Analysis Performed: EPA 8260; Volatile Organics by GC/MS.
Analysis Date: 06/26/01
Analyst: MRD

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| Acetone | 5.22 | ND | ND |
| Benzene | 1.74 | ND | ND |
| Bromobenzene | 1.74 | ND | ND |
| Bromochloromethane | 1.74 | ND | ND |
| Bromodichloromethane | 1.74 | ND | ND |
| Bromoform | 1.74 | ND | ND |
| Bromomethane | 1.74 | ND | ND |
| 2-Butanone (MEK) | 1.74 | ND | ND |
| n-Butylbenzene | 1.74 | ND | ND |
| sec-Butylbenzene | 1.74 | ND | ND |
| tert-Butylbenzene | 1.74 | ND | ND |
| Carbon Disulfide | 1.74 | ND | ND |
| Carbon tetrachloride | 1.74 | ND | ND |
| Chlorobenzene | 1.74 | ND | ND |
| Chloroethane | 1.74 | ND | ND |
| 2-Chloroethylvinyl ether | 1.74 | ND | ND |
| Chloroform | 1.74 | ND | ND |
| Chloromethane | 1.74 | ND | ND |
| 2-Chlorotoluene | 1.74 | ND | ND |
| 4-Chlorotoluene | 1.74 | ND | ND |
| 1,2-Dibromo-3-chloropropane | 1.74 | ND | ND |
| Dibromochloromethane | 1.74 | ND | ND |
| 1,2-Dibromoethane | 1.74 | ND | ND |
| Dibromomethane | 1.74 | ND | ND |
| 1,2-Dichlorobenzene | 1.74 | ND | ND |
| 1,3-Dichlorobenzene | 1.74 | ND | ND |
| 1,4-Dichlorobenzene | 1.74 | ND | ND |
| Dichlorodifluoromethane | 1.74 | ND | ND |
| 1,1-Dichloroethane | 1.74 | ND | ND |
| 1,2-Dichloroethane | 1.74 | ND | ND |

Results expressed as mg/kg unless otherwise noted.
ND means none detected at or above the detection limit listed.

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-3
Field ID: CLI Composite 1-2
Date/Time: 06/19/01 COMP
Matrix: Soil

EPA Category: Volatile Organics
Analysis Performed: EPA 8260; Volatile Organics by GC/MS.
Analysis Date: 06/26/01
Analyst: MRD

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| 1,1-Dichloroethene | 1.74 | ND | ND |
| cis-1,2-Dichloroethene | 1.74 | ND | ND |
| trans-1,2-Dichloroethene | 1.74 | ND | ND |
| 1,2-Dichloropropane | 1.74 | ND | ND |
| 1,3-Dichloropropane | 1.74 | ND | ND |
| 2,2-Dichloropropane | 1.74 | ND | ND |
| 1,1-Dichloropropene | 1.74 | ND | ND |
| cis-1,3-Dichloropropene | 1.74 | ND | ND |
| trans-1,3-Dichloropropene | 1.74 | ND | ND |
| Ethylbenzene | 1.74 | ND | ND |
| Hexachlorobutadiene | 1.74 | ND | ND |
| 2-Hexanone | 1.74 | ND | ND |
| Iodomethane | 1.74 | ND | ND |
| Isopropylbenzene | 1.74 | ND | ND |
| 4-Isopropyltoluene | 1.74 | ND | ND |
| 4-Methyl-2-pentanone | 1.74 | ND | ND |
| Methylene chloride | 1.74 | ND | ND |
| Naphthalene | 1.74 | ND | ND |
| n-Propylbenzene | 1.74 | ND | ND |
| Styrene | 1.74 | ND | ND |
| 1,1,1,2-Tetrachloroethane | 1.74 | ND | ND |
| 1,1,2,2-Tetrachloroethane | 1.74 | ND | ND |
| Tetrachloroethene | 1.74 | ND | ND |
| Toluene | 1.74 | ND | 10. |
| 1,2,3-Trichlorobenzene | 1.74 | ND | ND |
| 1,2,4-Trichlorobenzene | 1.74 | ND | ND |
| 1,1,1-Trichloroethane | 1.74 | ND | ND |
| 1,1,2-Trichloroethane | 1.74 | ND | ND |
| Trichloroethene | 1.74 | ND | ND |
| Trichlorofluoromethane | 1.74 | ND | ND |

Results expressed as mg/kg unless otherwise noted.
ND means none detected at or above the detection limit listed.

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-3
Field ID: CLI Composite 1-2
Date/Time: 06/19/01 COMP
Matrix: Soil

EPA Category: Volatile Organics
Analysis Performed: EPA 8260; Volatile Organics by GC/MS.
Analysis Date: 06/26/01
Analyst: MRD

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| 1,2,3-Trichloropropane | 1.74 | ND | ND |
| 1,2,4-Trimethylbenzene | 1.74 | ND | ND |
| 1,3,5-Trimethylbenzene | 1.74 | ND | ND |
| Vinyl acetate | 1.74 | ND | ND |
| Vinyl chloride | 1.74 | ND | ND |
| m,p-Xylene | 3.48 | ND | ND |
| o-Xylene | 1.74 | ND | ND |
| 4-Bromofluorobenzene (Surr.) | --- | --- | 99% |
| Dibromofluoromethane (Surr.) | --- | --- | 100% |
| Toluene-d8 (Surr.) | --- | --- | 102% |

Results expressed as mg/kg unless otherwise noted.
ND means none detected at or above the detection limit listed.

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-3
Field ID: CLI Composite 1-2
Date/Time: 06/19/01 COMP
Matrix: Soil

EPA Category: Extractable Organics
Analysis Performed: EPA 8270; Semivolatile Organics by GC/MS.
Analysis Date: 06/30/01
Analyst: AB

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| Acenaphthene | 69. | ND | ND |
| Acenaphthylene | 69. | ND | ND |
| Aldrin | 69. | ND | ND |
| Anthracene | 69. | ND | ND |
| Azobenzene | 58. | ND | ND |
| 1,2-Diphenylhydrazine | 58. | ND | ND |
| Benzo(a)anthracene | 69. | ND | ND |
| Benzo(a)pyrene | 69. | ND | ND |
| Benzo(b)fluoranthene | 69. | ND | ND |
| Benzo(g,h,i)perylene | 69. | ND | ND |
| Benzo(k)fluoranthene | 69. | ND | ND |
| beta-BHC | 69. | ND | ND |
| delta-BHC | 69. | ND | ND |
| bis(2-Chloroethoxy)methane | 69. | ND | ND |
| bis(2-Chloroethyl)ether | 69. | ND | ND |
| bis(2-Chloroisopropyl)ether | 69. | ND | ND |
| Bis(2-ethylhexyl)phthalate | 69. | ND | ND |
| 4-Bromophenyl phenyl ether | 69. | ND | ND |
| Butyl benzyl phthalate | 69. | ND | ND |
| 4-Chloro-3-methylphenol | 69. | ND | ND |
| 2-Chloronaphthalene | 69. | ND | ND |
| 2-Chlorophenol | 69. | ND | ND |
| 4-Chlorophenyl phenyl ether | 69. | ND | ND |
| Chrysene | 69. | ND | ND |
| 4,4-DDD | 69. | ND | ND |
| 4,4-DDE | 69. | ND | ND |
| 4,4-DDT | 69. | ND | ND |
| Di-n-butylphthalate | 69. | ND | ND |
| Di-n-octylphthalate | 69. | ND | ND |
| Dibenzo(a,h)anthracene | 69. | ND | ND |

Results expressed as mg/kg unless otherwise noted.
ND means none detected at or above the detection limit listed.

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-3
Field ID: CLI Composite 1-2
Date/Time: 06/19/01 COMP
Matrix: Soil

EPA Category: Extractable Organics
Analysis Performed: EPA 8270; Semivolatile Organics by GC/MS.
Analysis Date: 06/30/01
Analyst: AB

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| 1,2-Dichlorobenzene | 69. | ND | ND |
| 1,4-Dichlorobenzene | 69. | ND | ND |
| 1,3-Dichlorobenzene | 69. | ND | ND |
| 2,4-Dichlorophenol | 69. | ND | ND |
| Dieldrin | 69. | ND | ND |
| Diethyl phthalate | 69. | ND | ND |
| 2,4-Dimethylphenol | 69. | ND | ND |
| Dimethylphthalate | 69. | ND | ND |
| 2,4-Dinitrophenol | 138. | ND | ND |
| 2,4-Dinitrotoluene | 69. | ND | ND |
| 2,6-Dinitrotoluene | 69. | ND | ND |
| Endosulfan sulfate | 69. | ND | ND |
| Endrin Aldehyde | 69. | ND | ND |
| Fluoranthene | 69. | ND | ND |
| Fluorene | 69. | ND | ND |
| Heptachlor | 69. | ND | ND |
| Heptachlor epoxide | 69. | ND | ND |
| Hexachlorobenzene | 69. | ND | ND |
| Hexachlorobutadiene | 69. | ND | ND |
| Hexachloroethane | 69. | ND | ND |
| Indeno(1,2,3-cd)pyrene | 69. | ND | ND |
| Isophorone | 69. | ND | ND |
| 2-Methyl-4,6-dinitrophenol | 69. | ND | ND |
| N-Nitrosodi-n-propylamine | 69. | ND | ND |
| Naphthalene | 69. | ND | ND |
| Nitrobenzene | 69. | ND | ND |
| 4-Nitrophenol | 69. | ND | ND |
| 2-Nitrophenol | 69. | ND | ND |
| Pentachlorophenol | 69. | ND | ND |
| Phenanthrene | 69. | ND | ND |

Results expressed as mg/kg unless otherwise noted.
ND means none detected at or above the detection limit listed.



SCOEPA00010198

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-3
Field ID: CLI Composite 1-2
Date/Time: 06/19/01 COMP
Matrix: Soil

EPA Category: Extractable Organics
Analysis Performed: EPA 8270; Semivolatile Organics by GC/MS.
Analysis Date: 06/30/01
Analyst: AB

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| Phenol | 69. | ND | ND |
| Pyrene | 69. | ND | ND |
| 1,2,4-Trichlorobenzene | 69. | ND | ND |
| 2,4,6-Trichlorophenol | 69. | ND | ND |
| 2-Fluorobiphenyl (Surr.) | --- | --- | Diluted out of range |
| 2-Fluorophenol (Surr.) | --- | --- | Diluted out of range |
| Nitrobenzene-d5 (Surr.) | --- | --- | Diluted out of range |
| Phenol-d6 (Surr.) | --- | --- | Diluted out of range |
| Terphenyl-d14 (Surr.) | --- | --- | Diluted out of range |
| 2,4,6-Tribromophenol (Surr.) | --- | --- | Diluted out of range |

Results expressed as mg/kg unless otherwise noted.
ND means none detected at or above the detection limit listed.



SCOEPA00010199

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-3
Field ID: CLI Composite 1-2
Date/Time: 06/19/01 COMP
Matrix: Soil

EPA Category: Extractable Organics
Analysis Performed: EPA 8270 SIM; Polynuclear Aromatic Hydrocarbons by SIM GC/MS
Analysis Date: 06/29/01
Analyst: AB

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| Acenaphthene | 0.17 | ND | ND |
| Acenaphthylene | 0.17 | ND | ND |
| Anthracene | 0.17 | ND | ND |
| Benzo(a)anthracene | 0.17 | ND | 0.2 |
| Benzo(a)pyrene | 0.17 | ND | 0.2 |
| Benzo(b)fluoranthene | 0.17 | ND | 0.3 |
| Benzo(g,h,i)perylene | 0.17 | ND | 0.2 |
| Benzo(k)fluoranthene | 0.17 | ND | 0.2 |
| Chrysene | 0.17 | ND | 0.3 |
| Dibenzo(a,h)anthracene | 0.17 | ND | ND |
| Fluoranthene | 0.17 | ND | 0.4 |
| Fluorene | 0.17 | ND | ND |
| Indeno(1,2,3-cd)pyrene | 0.17 | ND | 0.2 |
| Naphthalene | 0.17 | ND | ND |
| Phenanthrene | 0.17 | ND | 0.2 |
| Pyrene | 0.17 | ND | 0.4 |
| Decafluorobiphenol (Surr.) | --- | --- | Diluted out of range |

Results expressed as mg/kg unless otherwise noted.
ND means none detected at or above the detection limit listed.

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-3
Field ID: CLI Composite 1-2
Date/Time: 06/19/01 COMP
Matrix: Soil

EPA Category: Extractable Organics
Analysis Performed: NW TPH-Dx; TPH quantitative semi-volatile petroleum products
Analysis Date: 06/27/01
Analyst: MKM

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| Diesel | 2200. | ND | ND |
| Hydrocarbons heavier than C24 | 2200. | ND | 9000. |
| o-Terphenyl (Surr.) | --- | --- | Diluted out of range |

Results expressed as mg/kg unless otherwise noted.
ND means none detected at or above the detection limit listed.

**Coffey Laboratories, Inc.**
12423 N.E. Whitaker Way • Portland, OR • 97230 • (503) 254-1794 • FAX (503) 254-1452

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-4
Field ID: 01-72
Date/Time: 06/19/01 1400
Matrix: Water

EPA Category: Conventional Parameters

| Parameter | Method | Detection Limit | Analytical Result | Units |
|---|---|---|---|---|
| Total Cyanide | EPA 335.2 | 0.1 | ND | mg/L |
| Total Organic Carbon | EPA 415.1 | 0.8 | ND | mg/L |

ND means none detected at or above the detection limit listed.

**Coffey Laboratories, Inc.**
12423 N.E. Whitaker Way • Portland, OR • 97230 • (503) 254-1794 • FAX (503) 254-1452

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-4
Field ID: 01-72
Date/Time: 06/19/01 1400
Matrix: Water

EPA Category: Metals

| Parameter | Method | Detection Limit | Analytical Result | Units |
|---|---|---|---|---|
| Antimony | EPA 200.8 | 0.01 | ND | mg/L |
| Arsenic | EPA 200.8 | 0.005 | ND | mg/L |
| Barium | EPA 200.8 | 0.001 | ND | mg/L |
| Cadmium | EPA 200.8 | 0.002 | ND | mg/L |
| Chromium | EPA 200.8 | 0.01 | ND | mg/L |
| Cobalt | EPA 200.8 | 0.001 | ND | mg/L |
| Copper | EPA 200.8 | 0.005 | ND | mg/L |
| Iron | EPA 200.7 | 0.5 | ND | mg/L |
| Lead | EPA 200.8 | 0.002 | ND | mg/L |
| Magnesium | EPA 200.7 | 0.05 | ND | mg/L |
| Manganese | EPA 200.7 | 0.1 | ND | mg/L |
| Mercury | EPA 245.1 | 0.005 | ND | mg/L |
| Nickel | EPA 200.8 | 0.005 | ND | mg/L |
| Selenium | EPA 200.8 | 0.05 | ND | mg/L |
| Silver | EPA 200.8 | 0.005 | ND | mg/L |
| Thallium | EPA 200.8 | 0.001 | ND | mg/L |
| Titanium | EPA 200.8 | 0.02 | ND | mg/L |
| Vanadium | EPA 200.8 | 0.001 | ND | mg/L |
| Zinc | EPA 200.8 | 0.01 | ND | mg/L |

ND means none detected at or above the detection limit listed.

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## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-4
Field ID: 01-72
Date/Time: 06/19/01 1400
Matrix: Water

EPA Category: Volatile Organics
Analysis Performed: EPA 8260; Volatile Organics by GC/MS.
Analysis Date: 06/26/01
Analyst: MRD

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| Acetone | 15. | ND | ND |
| Benzene | 5. | ND | ND |
| Bromobenzene | 5. | ND | ND |
| Bromochloromethane | 5. | ND | ND |
| Bromodichloromethane | 5. | ND | ND |
| Bromoform | 5. | ND | ND |
| Bromomethane | 5. | ND | ND |
| 2-Butanone (MEK) | 5. | ND | ND |
| n-Butylbenzene | 5. | ND | ND |
| sec-Butylbenzene | 5. | ND | ND |
| tert-Butylbenzene | 5. | ND | ND |
| Carbon Disulfide | 5. | ND | ND |
| Carbon tetrachloride | 5. | ND | ND |
| Chlorobenzene | 5. | ND | ND |
| Chloroethane | 5. | ND | ND |
| 2-Chloroethylvinyl ether | 5. | ND | ND |
| Chloroform | 5. | ND | ND |
| Chloromethane | 5. | ND | ND |
| 2-Chlorotoluene | 5. | ND | ND |
| 4-Chlorotoluene | 5. | ND | ND |
| 1,2-Dibromo-3-chloropropane | 5. | ND | ND |
| Dibromochloromethane | 5. | ND | ND |
| 1,2-Dibromoethane | 5. | ND | ND |
| Dibromomethane | 5. | ND | ND |
| 1,2-Dichlorobenzene | 5. | ND | ND |
| 1,3-Dichlorobenzene | 5. | ND | ND |
| 1,4-Dichlorobenzene | 5. | ND | ND |
| Dichlorodifluoromethane | 5. | ND | ND |
| 1,1-Dichloroethane | 5. | ND | ND |
| 1,2-Dichloroethane | 5. | ND | ND |

Results expressed as $\mu$g/L unless otherwise noted.
ND means none detected at or above the detection limit listed.

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-4
Field ID: 01-72
Date/Time: 06/19/01 1400
Matrix: Water

EPA Category: Volatile Organics
Analysis Performed: EPA 8260; Volatile Organics by GC/MS.
Analysis Date: 06/26/01
Analyst: MRD

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| 1,1-Dichloroethene | 5. | ND | ND |
| cis-1,2-Dichloroethene | 5. | ND | ND |
| trans-1,2-Dichloroethene | 5. | ND | ND |
| 1,2-Dichloropropane | 5. | ND | ND |
| 1,3-Dichloropropane | 5. | ND | ND |
| 2,2-Dichloropropane | 5. | ND | ND |
| 1,1-Dichloropropene | 5. | ND | ND |
| cis-1,3-Dichloropropene | 5. | ND | ND |
| trans-1,3-Dichloropropene | 5. | ND | ND |
| Ethylbenzene | 5. | ND | ND |
| Hexachlorobutadiene | 5. | ND | ND |
| 2-Hexanone | 5. | ND | ND |
| Iodomethane | 5. | ND | ND |
| Isopropylbenzene | 5. | ND | ND |
| 4-Isopropyltoluene | 5. | ND | ND |
| 4-Methyl-2-pentanone | 5. | ND | ND |
| Methylene chloride | 5. | ND | 12. |
| Naphthalene | 5. | ND | ND |
| n-Propylbenzene | 5. | ND | ND |
| Styrene | 5. | ND | ND |
| 1,1,1,2-Tetrachloroethane | 5. | ND | ND |
| 1,1,2,2-Tetrachloroethane | 5. | ND | ND |
| Tetrachloroethene | 5. | ND | ND |
| Toluene | 5. | ND | ND |
| 1,2,3-Trichlorobenzene | 5. | ND | ND |
| 1,2,4-Trichlorobenzene | 5. | ND | ND |
| 1,1,1-Trichloroethane | 5. | ND | ND |
| 1,1,2-Trichloroethane | 5. | ND | ND |
| Trichloroethene | 5. | ND | ND |
| Trichlorofluoromethane | 5. | ND | ND |

Results expressed as $\mu$g/L unless otherwise noted.
ND means none detected at or above the detection limit listed.



SCOEPA00010205

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-4
Field ID: 01-72
Date/Time: 06/19/01 1400
Matrix: Water

EPA Category: Volatile Organics
Analysis Performed: EPA 8260; Volatile Organics by GC/MS.
Analysis Date: 06/26/01
Analyst: MRD

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| 1,2,3-Trichloropropane | 5. | ND | ND |
| 1,2,4-Trimethylbenzene | 5. | ND | ND |
| 1,3,5-Trimethylbenzene | 5. | ND | ND |
| Vinyl acetate | 5. | ND | ND |
| Vinyl chloride | 5. | ND | ND |
| m,p-Xylene | 10. | ND | ND |
| o-Xylene | 5. | ND | ND |
| 4-Bromofluorobenzene (Surr.) | --- | --- | 99% |
| Dibromofluoromethane (Surr.) | ---. | --- | 102% |
| Toluene-d8 (Surr.) | ---. | --- | 102% |

Results expressed as $\mu$g/L unless otherwise noted.
ND means none detected at or above the detection limit listed.

Note: The sample was not in a preserved zero head space vial. The Methylene chloride could possibly be due to laboratory contaminations the sample was shared for other analytical methods.

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-4
Field ID: 01-72
Date/Time: 06/19/01 1400
Matrix: Water

EPA Category: Extractable Organics
Analysis Performed: EPA 8270; Semivolatile Organics by GC/MS.
Analysis Date: 06/27/01
Analyst: AB

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| Acenaphthene | 0.12 | ND | ND |
| Acenaphthylene | 0.12 | ND | ND |
| Aldrin | 0.12 | ND | ND |
| Anthracene | 0.12 | ND | ND |
| Benzo(a)anthracene | 0.12 | ND | ND |
| Benzo(a)pyrene | 0.12 | ND | ND |
| Benzo(b)fluoranthene | 0.12 | ND | ND |
| Benzo(g,h,i)perylene | 0.12 | ND | ND |
| Benzo(k)fluoranthene | 0.12 | ND | ND |
| beta-BHC | 0.12 | ND | ND |
| delta-BHC | 0.12 | ND | ND |
| bis(2-Chloroethoxy)methane | 0.12 | ND | ND |
| bis(2-Chloroethyl)ether | 0.12 | ND | ND |
| bis(2-Chloroisopropyl)ether | 0.12 | ND | ND |
| Bis(2-ethylhexyl)phthalate | 0.12 | ND | ND |
| 4-Bromophenyl phenyl ether | 0.12 | ND | ND |
| Butyl benzyl phthalate | 0.12 | ND | ND |
| 4-Chloro-3-methylphenol | 0.12 | ND | ND |
| 2-Chloronaphthalene | 0.12 | ND | ND |
| 2-Chlorophenol | 0.12 | ND | ND |
| 4-Chlorophenyl phenyl ether | 0.12 | ND | ND |
| Chrysene | 0.12 | ND | ND |
| 4,4-DDD | 0.12 | ND | ND |
| 4,4-DDE | 0.12 | ND | ND |
| 4,4-DDT | 0.12 | ND | ND |
| Di-n-butylphthalate | 0.12 | ND | ND |
| Di-n-octylphthalate | 0.12 | ND | ND |
| Dibenzo(a,h)anthracene | 0.12 | ND | ND |
| 1,2-Dichlorobenzene | 0.12 | ND | ND |
| 1,4-Dichlorobenzene | 0.12 | ND | ND |

Results expressed as mg/L unless otherwise noted.
ND means none detected at or above the detection limit listed.

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-4
Field ID: 01-72
Date/Time: 06/19/01 1400
Matrix: Water

EPA Category: Extractable Organics
Analysis Performed: EPA 8270; Semivolatile Organics by GC/MS.
Analysis Date: 06/27/01
Analyst: AB

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| 1,3-Dichlorobenzene | 0.12 | ND | ND |
| 2,4-Dichlorophenol | 0.12 | ND | ND |
| Dieldrin | 0.12 | ND | ND |
| Diethyl phthalate | 0.12 | ND | ND |
| 2,4-Dimethylphenol | 0.12 | ND | ND |
| Dimethylphthalate | 0.12 | ND | ND |
| 2,4-Dinitrophenol | 0.24 | ND | ND |
| 2,4-Dinitrotoluene | 0.12 | ND | ND |
| 2,6-Dinitrotoluene | 0.12 | ND | ND |
| Endosulfan sulfate | 0.12 | ND | ND |
| Endrin Aldehyde | 0.12 | ND | ND |
| Fluoranthene | 0.12 | ND | ND |
| Fluorene | 0.12 | ND | ND |
| Heptachlor | 0.12 | ND | ND |
| Heptachlor epoxide | 0.12 | ND | ND |
| Hexachlorobenzene | 0.12 | ND | ND |
| Hexachlorobutadiene | 0.12 | ND | ND |
| Hexachloroethane | 0.12 | ND | ND |
| Indeno(1,2,3-cd)pyrene | 0.12 | ND | ND |
| Isophorone | 0.12 | ND | ND |
| 2-Methyl-4,6-dinitrophenol | 0.12 | ND | ND |
| N-Nitrosodi-n-propylamine | 0.12 | ND | ND |
| Naphthalene | 0.12 | ND | ND |
| Nitrobenzene | 0.12 | ND | ND |
| 4-Nitrophenol | 0.12 | ND | ND |
| 2-Nitrophenol | 0.12 | ND | ND |
| Pentachlorophenol | 0.12 | ND | ND |
| Phenanthrene | 0.12 | ND | ND |
| Phenol | 0.12 | ND | ND |
| Pyrene | 0.12 | ND | ND |

Results expressed as mg/L unless otherwise noted.
ND means none detected at or above the detection limit listed.

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-4
Field ID: 01-72
Date/Time: 06/19/01 1400
Matrix: Water

EPA Category: Extractable Organics
Analysis Performed: EPA 8270; Semivolatile Organics by GC/MS.
Analysis Date: 06/27/01
Analyst: AB

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| 1,2,4-Trichlorobenzene | 0.12 | ND | ND |
| 2,4,6-Trichlorophenol | 0.12 | ND | ND |
| 2-Fluorobiphenyl (Surr.) | --- | --- | 95% |
| 2-Fluorophenol (Surr.) | --- | --- | 60% |
| Nitrobenzene-d5 (Surr.) | --- | --- | 90% |
| Phenol-d6 (Surr.) | --- | --- | 39% |
| Terphenyl-d14 (Surr.) | --- | --- | 115% |
| 2,4,6-Tribromophenol (Surr.) | --- | --- | 80% |

Results expressed as mg/L unless otherwise noted.
ND means none detected at or above the detection limit listed.

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-4
Field ID: 01-72
Date/Time: 06/19/01 1400
Matrix: Water

EPA Category: Extractable Organics
Analysis Performed: EPA 8270 SIM; Polynuclear Aromatic Hydrocarbons by SIM GC/MS
Analysis Date: 06/29/01
Analyst: AB

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| Acenaphthene | 2. | ND | ND |
| Acenaphthylene | 2. | ND | ND |
| Anthracene | 2. | ND | ND |
| Benzo(a)anthracene | 2. | ND | ND |
| Benzo(a)pyrene | 2. | ND | ND |
| Benzo(b)fluoranthene | 2. | ND | ND |
| Benzo(g,h,i)perylene | 2. | ND | ND |
| Benzo(k)fluoranthene | 2. | ND | ND |
| Chrysene | 2. | ND | ND |
| Dibenzo(a,h)anthracene | 2. | ND | ND |
| Fluoranthene | 2. | ND | ND |
| Fluorene | 2. | ND | ND |
| Indeno(1,2,3-cd)pyrene | 2. | ND | ND |
| Naphthalene | 2. | ND | ND |
| Phenanthrene | 2. | ND | ND |
| Pyrene | 2. | ND | ND |
| Decafluorobiphenol (Surr.) | --- | --- | 70% |

Results expressed as μg/L unless otherwise noted.
ND means none detected at or above the detection limit listed.

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-4
Field ID: 01-72
Date/Time: 06/19/01 1400
Matrix: Water

EPA Category: Extractable Organics
Analysis Performed: NW TPH-Dx; TPH quantitative semi-volatile petroleum products
Analysis Date: 06/27/01
Analyst: MKM

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| Diesel | 2.5 | ND | ND |
| Hydrocarbons heavier than C24 | 5. | ND | ND |
| o-Terphenyl (Surr.) | --- | --- | 120% |

Results expressed as mg/l unless otherwise noted.
ND means none detected at or above the detection limit listed.

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# Method Blank and Calibration Blank Data
# Summary Report

**Coffey Laboratories, Inc.**
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## Calibration Blank Verification Report
## For Job Number: A10621BI

Wacker Siltronic

Report Date: March 5, 2002


Method: EPA 200.7; Metals Analyses by ICP

| Analyte | Detection Limit | Blank Verification Verification Result | Data Type | Batch Identification |
|---|---|---|---|---|
| Iron | 0.05 | ND | Continuing Calibration Blank | 1060774-23 |
| Iron | 0.05 | ND | Method Blank | 1060774-24 |
| Magnesium | 0.005 | ND | Continuing Calibration Blank | 1060774-23 |
| Magnesium | 0.005 | ND | Method Blank | 1060774-24 |
| Manganese | 0.002 | ND | Continuing Calibration Blank | 1060774-23 |
| Manganese | 0.002 | ND | Method Blank | 1060774-24 |

Results expressed as mg/L.
ND means none detected at or above the detection limit listed.

SCOEPA00010213

COFFEY LABORATORIES, INC.
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## Calibration Verification Report
## For Job Number: A10621BI

Wacker Siltronic



Method: EPA 200.7; Metals Analyses by ICP

| Analyte | Verification Result | Theoretical Result | Percent Recovery | Percent Recovery Control Limit | Data Type | Batch Identification |
|---|---|---|---|---|---|---|
| Iron | 0.1 | 0.1 | 100. | 75.-125. | Initial Calibration Verif. | 1060774-6 |
| Iron | 2.3 | 2.2 | 103. | 75.-125. | Laboratory Control Sample | 1060774-22 |
| Iron | 10. | 10. | 100. | 75.-125. | Continuing Calibration Verif. | 1060774-40 |
| Magnesium | 0.1 | 0.1 | 100. | 75.-125. | Initial Calibration Verif. | 1060774-6 |
| Magnesium | 2.2 | 2.2 | 100. | 75.-125. | Laboratory Control Sample | 1060774-22 |
| Magnesium | 10. | 10. | 100. | 75.-125. | Continuing Calibration Verif. | 1060774-40 |
| Manganese | 0.1 | 0.1 | 100. | 75.-125. | Initial Calibration Verif. | 1060774-6 |
| Manganese | 2.2 | 2.2 | 100. | 75.-125. | Laboratory Control Sample | 1060774-22 |
| Manganese | 11. | 10. | 110. | 75.-125. | Continuing Calibration Verif. | 1060774-41 |

Results expressed as mg/L.

SCOEPA00010214

COFFEY LABORATORIES, INC.
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## Calibration Blank Verification Report
## For Job Number: A10621BI

Wacker Siltronic

Report Date: March 5, 2002


Method: EPA 200.8; Metals Analyses by ICP/MS.

| Analyte | Detection Limit | Blank Verification Verification Result | Data Type | Batch Identification |
|---|---|---|---|---|
| Antimony | 0.001 | ND | Method Blank | 1060693-3 |
| Antimony | 0.0005 | ND | Continuing Calibration Blank | 1060693-16 |
| Arsenic | 0.0005 | ND | Methon Blank | 1060693-3 |
| Arsenic | 0.0005 | ND | Continuing Calibration Blank | 1060693-16 |
| Barium | 0.0001 | ND | Method Blank | 1060693-3 |
| Barium | 0.0001 | ND | Continuing Calibration Blank | 1060693-16 |
| Cadmium | 0.0002 | ND | Method Blank | 1060693-3 |
| Cadmium | 0.0002 | ND | Continuing Calibration Blank | 1060693-16 |
| Chromium | 0.001 | ND | Method Blank | 1060693-3 |
| Chromium | 0.001 | ND | Continuing Calibration Blank | 1060693-16 |
| Cobalt | 0.0001 | ND | Method Blank | 1060693-3 |
| Cobalt | 0.0001 | ND | Continuing Calibration Blank | 1060693-16 |
| Copper | 0.0005 | ND | Method Blank | 1060693-3 |
| Copper | 0.0005 | ND | Continuing Calibration Blank | 1060693-16 |

Results expressed as mg/L.
ND means none detected at or above the detection limit listed.



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## Calibration Blank Verification Report
## For Job Number: A10621BI

Wacker Siltronic



Method: EPA 200.8; Metals Analyses by ICP/MS.

| Analyte | Detection Limit | Blank Verification Verification Result | Data Type | Batch Identification |
|---|---|---|---|---|
| Lead | 0.0002 | ND | Method Blank | 1060693-3 |
| Lead | 0.0002 | ND | Continuing Calibration Blank | 1060693-16 |
| Nickel | 0.0005 | ND | Method Blank | 1060693-3 |
| Nickel | 0.0005 | ND | Continuing Calibration Blank | 1060693-16 |
| Selenium | 0.005 | ND | Method Blank | 1060693-3 |
| Selenium | 0.005 | ND | Continuing Calibration Blank | 1060693-16 |
| Silver | 0.0002 | ND | Method Blank | 1060693-3 |
| Silver | 0.0002 | ND | Continuing Calibration Blank | 1060693-16 |
| Thallium | 0.0001 | ND | Method Blank | 1060693-3 |
| Thallium | 0.0001 | ND | Continuing Calibration Blank | 1060693-16 |
| Titanium | 0.002 | ND | Method Blank | 1060693-3 |
| Titanium | 0.002 | ND | Continuing Calibration Blank | 1060693-16 |
| Vanadium | 0.0001 | ND | Method Blank | 1060693-3 |
| Vanadium | 0.0001 | ND | Continuing Calibration Blank | 1060693-16 |
| Zinc | 0.001 | ND | Method Blank | 1060693-3 |
| Zinc | 0.001 | ND | Continuing Calibration Blank | 1060693-16 |

Results expressed as mg/L.
ND means none detected at or above the detection limit listed.



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## Calibration Verification Report
## For Job Number: A10621BI

Wacker Siltronic

Report Date: March 5, 2002


Method: EPA 200.8; Metals Analyses by ICP/MS.

| Analyte | Verification Result | Theoretical Result | Percent Recovery | Percent Recovery Control Limit | Data Type | Batch Identification |
|---|---|---|---|---|---|---|
| Antimony | 0.096 | 0.1 | 96. | 75.-125. | Initial Calibration Verif. | 1060693-1 |
| Antimony | 0.02 | 0.02 | 100. | 75.-125. | Laboratory Control Sample | 1060693-2 |
| Arsenic | 0.099 | 0.1 | 99. | 75.-125. | Initial Calibration Verif. | 1060693-1 |
| Arsenic | 0.019 | 0.02 | 95. | 75.-125. | Laboratory Control Sample | 1060693-2 |
| Barium | 0.1 | 0.1 | 100. | 75.-125. | Initial Calibration Verif. | 1060693-1 |
| Barium | 0.019 | 0.02 | 95. | 75.-125. | Laboratory Control Sample | 1060693-2 |
| Cadmium | 0.099 | 0.1 | 99. | 75.-125. | Initial Calibration Verif. | 1060693-1 |
| Cadmium | 0.02 | 0.2 | 100. | 75.-125. | Laboratory Control Sample | 1060693-2 |
| Chromium | 0.1 | 0.1 | 100. | 75.-125. | Initial Calibration Verif. | 1060693-1 |
| Chromium | 0.02 | 0.02 | 100. | 75.-125. | Laboratory Control Sample | 1060693-2 |

Results expressed as mg/L.



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## Calibration Verification Report
## For Job Number: A10621BI

Wacker Siltronic

Report Date: March 5, 2002


Method: EPA 200.8; Metals Analyses by ICP/MS.

| Analyte | Verification Result | Theoretical Result | Percent Recovery | Percent Recovery Control Limit | Data Type | Batch Identification |
|---|---|---|---|---|---|---|
| Cobalt | 0.1 | 0.1 | 100. | 75.-125. | Initial Calibration Verif. | 1060693-1 |
| Cobalt | 0.02 | 0.02 | 100. | 75.-125. | Laboratory Control Sample | 1060693-2 |
| Copper | 0.1 | 0.1 | 100. | 75.-125. | Initial Calibration Verif. | 1060693-1 |
| Copper | 0.02 | 0.02 | 100. | 75.-125. | Laboratory Control Sample | 1060693-2 |
| Lead | 0.1 | 0..1 | 100. | 75.-125. | Initial Calibration Verif. | 1060693-1 |
| Lead | 0.02 | 0.02 | 100. | 75.-125. | Laboratory Control Sample | 1060693-2 |
| Nickel | 0.099 | 0.1 | 99. | 75.-125. | Initial Calibration Verif. | 1060693-1 |
| Nickel | 0.019 | 0.02 | 98. | 75.-125. | Laboratory Control Sample | 1060693-2 |

Results expressed as mg/L.
* Values expressed as percent values.

SCOEPA00010218

## Calibration Verification Report
## For Job Number: A10621BI

Wacker Siltronic



Method: EPA 200.8; Metals Analyses by ICP/MS.

| Analyte | Verification Result | Theoretical Result | Percent Recovery | Percent Recovery Control Limit | Data Type | Batch Identification |
|---|---|---|---|---|---|---|
| Selenium | 0.099 | 0.1 | 99. | 75.-125. | Initial Calibration Verif. | 1060693-1 |
| Selenium | 0.018 | 0.02 | 90. | 75.-125. | Laboratory Control Sample | 1060693-2 |
| Silver | 0.048 | 0.05 | 97. | 75.-125. | Initial Calibration Verif. | 1060693-1 |
| Silver | 0.019 | 0.02 | 94. | 75.-125. | Laboratory Control Sample | 1060693-2 |
| Thallium | 0.1 | 0.1 | 100. | 75.-125. | Initial Calibration Verif. | 1060693-1 |
| Thallium | 0.019 | 0.02 | 94. | 75.-125. | Laboratory Control Sample | 1060693-2 |
| Titanium | 0.099 | 0.1 | 99. | 75.-125. | Initial Calibration Verif. | 1060693-1 |
| Titanium | 0.02 | 0.02 | 100. | 75.-125. | Laboratory Control Sample | 1060693-2 |
| Vanadium | 0.1 | 0.1 | 100. | 75.-125. | Initial Calibration Verif. | 1060693-1 |
| Vanadium | 0.019 | 0.02 | 98. | 75.-125. | Laboratory Control Sample | 1060693-2 |
| Zinc | 0.1 | 0.1 | 100. | 75.-125. | Initial Calibration Verif. | 1060693-1 |
| Zinc | 0.02 | 0.02 | 100. | 75.-125. | Laboratory Control Sample | 1060693-2 |

Results expressed as mg/L.



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## Calibration Blank Verification Report
## For Job Number: A10621BI

Wacker Siltronic



Method: EPA 245.1; Mercury by cold vapor.

| Analyte | Detection Limit | Blank Verification Verification Result | Data Type | Batch Identification |
|---|---|---|---|---|
| Mercury | 0.0005 | ND | Initial Calibration Blank | 1060638-2 |
| Mercury | 0.0005 | ND | Continuing Calibration Blank | 1060638-13 |

Results expressed as mg/L.
ND means none detected at or above the detection limit listed.

SCOEPA00010220

## Calibration Verification Report
## For Job Number: A10621BI

Wacker Siltronic



Method: EPA 245.1; Mercury by cold vapor.

| Analyte | Verification Result | Theoretical Result | Percent Recovery | Percent Recovery Control Limit | Data Type | Batch Identification |
|---|---|---|---|---|---|---|
| Mercury | 0.5 | 0.5 | 100. | 80.-120. | Initial Calibration Verif. | 1060638-1 |
| Mercury | 0.5 | 0.5 | 100. | 80.-120. | Laboratory Control Sample | 1060638-3 |
| Mercury | 0.5 | 0.5 | 100. | 80.-120. | Continuing Calibration Verif. | 1060638-12 |

Results expressed as mg/L.

SCOEPA00010221

## Calibration Blank Verification Report
## For Job Number: A10621BI

Wacker Siltronic



Method: EPA 415.1; Total Organic Carbon.

| Analyte | Detection Limit | Blank Verification Verification Result | Data Type | Batch Identification |
|---|---|---|---|---|
| Total Organic Carbon | 0.8 | ND | Initial Calibration Blank | 1060772-2 |
| Total Organic Carbon | 0.8 | ND | Continuing Calibration Blank | 1060772-10 |

Results expressed as mg/L.
ND means none detected at or above the detection limit listed.

SCOEPA00010222

COFFEY LABORATORIES, INC.
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## Calibration Verification Report
## For Job Number: A10621BI

Wacker Siltronic

Report Date: March 5, 2002


Method: EPA 415.1; Total Organic Carbon.

| Analyte | Verification Result | Theoretical Result | Percent Recovery | Percent Recovery Control Limit | Data Type | Batch Identification |
|---|---|---|---|---|---|---|
| Total Organic Carbon | 10.3 | 10. | 103. | 80.-120. | Initial Calibration Verif. | 1060772-1 |
| Total Organic Carbon | 1.06 | 1.0 | 106. | 80.-120. | Continuing Calibration Verif. | 1060772-3 |
| Total Organic Carbon | 56. | 59. | 95. | 80.-120. | Laboratory Control Sample | 1060772-4 |
| Total Organic Carbon | 10.4 | 10. | 104. | 80.-120. | Continuing Calibration Verif. | 1060772-11 |

Results expressed as mg/L.



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## Calibration Verification Report
## For Job Number: A10621BI

Wacker Siltronic

Report Date: March 5, 2002


Method: EPA 415.1; Total Organic Carbon.

| Analyte | Verification Result | Theoretical Result | Percent Recovery | Percent Recovery Control Limit | Data Type | Batch Identification |
|---|---|---|---|---|---|---|
| Total Organic Carbon | 65. | 59. | 110. | 80.-120. | Laboratory Control Sample | 1070042-1 |
| Total Organic Carbon | 67. | 59. | 113. | 80.-120. | Laboratory Control Sample | 1070042-4 |

Results expressed as mg/Kg.

SCOEPA00010224

**COFFEY LABORATORIES, INC.**
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## Calibration Blank Verification Report
## For Job Number: A10621BI

Wacker Siltronic

Report Date: March 5, 2002


Method: EPA 6020; EPA 6020

| Analyte | Detection Limit | Blank Verification Verification Result | Data Type | Batch Identification |
|---|---|---|---|---|
| Antimony | 0.05 | ND | Method Blank | 1060709-1 |
| Antimony | 0.0005 | ND | Continuing Calibration Blank | 1060709-5 |
| Arsenic | 0.05 | ND | Method Blank | 1060709-1 |
| Arsenic | 0.0005 | ND | Continuing Calibration Blank | 1060709-5 |
| Barium | 0.01 | ND | Method Blank | 1060709-1 |
| Barium | 0.0001 | ND | Continuing Calibration Blank | 1060709-5 |
| Cadmium | 0.02 | ND | Method Blank | 1060709-1 |
| Cadmium | 0.0002 | ND | Continuing Calibration Blank | 1060709-5 |
| Chromium | 0.1 | ND | Method Blank | 1060709-1 |
| Chromium | 0.001 | ND | Continuing Calibration Blank | 1060709-5 |
| Cobalt | 0.01 | ND | Method Blank | 1060709-1 |
| Cobalt | 0.0001 | ND | Continuing Calibration Blank | 1060709-5 |

Results expressed as mg/L.
ND means none detected at or above the detection limit listed.



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## Calibration Blank Verification Report
## For Job Number: A10621BI

Wacker Siltronic



Method: EPA 6020; EPA 6020

| Analyte | Detection Limit | Blank Verification Verification Result | Data Type | Batch Identification |
|---|---|---|---|---|
| Copper | 0.05 | ND | Method Blank | 1060709-1 |
| Copper | 0.0005 | ND | Continuing Calibration Blank | 1060709-5 |
| Lead | 0.02 | ND | Method Blank | 1060709-1 |
| Lead | 0.0002 | ND | Continuing Calibration Blank | 1060709-5 |
| Nickel | 0.05 | ND | Method Blank | 1060709-1 |
| Nickel | 0.0005 | ND | Continuing Calibration Blank | 1060709-5 |
| Selenium | 0.1 | ND | Method Blank | 1060709-1 |
| Selenium | 0.001 | ND | Continuing Calibration Blank | 1060709-5 |
| Silver | 0.02 | ND | Method Blank | 1060709-1 |
| Silver | 0.0002 | ND | Continuing Calibration Blank | 1060709-5 |
| Thallium | 0.01 | ND | Method Blank | 1060709-1 |
| Thallium | 0.0001 | ND | Continuing Calibration Blank | 1060709-5 |
| Vanadium | 0.01 | ND | Method Blank | 1060709-1 |
| Vanadium | 0.0001 | ND | Continuing Calibration Blank | 1060709-5 |

Results expressed as mg/L.
ND means none detected at or above the detection limit listed.



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## Calibration Verification Report
## For Job Number: A10621BI

Wacker Siltronic



Method: EPA 6020; EPA 6020

| Analyte | Verification Result | Theoretical Result | Percent Recovery | Percent Recovery Control Limit | Data Type | Batch Identification |
|---|---|---|---|---|---|---|
| Antimony | 2.2 | 2.0 | 110. | 75.-125. | Laboratory Control Sample | 1060709-2 |
| Antimony | 0.088 | 0.1 | 88. | 75.-125. | Continuing Calibration Verif. | 1060709-3 |
| Arsenic | 2.0 | 2.0 | 100. | 75.-125. | Laboratory Control Sample | 1060709-2 |
| Arsenic | 0.1 | 0.1 | 100. | 75.-125. | Continuing Calibration Verif. | 1060709-3 |
| Barium | 2.0 | 2.0 | 100. | 75.-125. | Laboratory Control Sample | 1060709-2 |
| Barium | 0.1 | 0.1 | 100. | 75.-125. | Continuing Calibration Verif. | 1060709-3 |
| Cadmium | 2.0 | 2.0 | 100. | 75.-125. | Laboratory Control Sample | 1060709-2 |
| Cadmium | 0.1 | 0.1 | 100. | 75.-125. | Continuing Calibration Verif. | 1060709-3 |
| Chromium | 2.1 | 2.0 | 105. | 75.-125. | Laboratory Control Sample | 1060709-2 |
| Chromium | 0.1 | 0.1 | 100. | 75.-125. | Continuing Calibration Verif. | 1060709-3 |
| Cobalt | 2.1 | 2.0 | 105. | 75.-125. | Laboratory Control Sample | 1060709-2 |
| Cobalt | 0.1 | 0.1 | 100. | 75.-125. | Continuing Calibration Verif. | 1060709-3 |

Results expressed as mg/L.



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## Calibration Verification Report
## For Job Number: A10621BI

Wacker Siltronic

Report Date: March 5, 2002


Method: EPA 6020; EPA 6020

| Analyte | Verification Result | Theoretical Result | Percent Recovery | Percent Recovery Control Limit | Data Type | Batch Identification |
|---|---|---|---|---|---|---|
| Copper | 2.1 | 2.0 | 105. | 75.-125. | Laboratory Control Sample | 1060709-2 |
| Copper | 0.1 | 0.1 | 100. | 75.-125. | Continuing Calibration Verif. | 1060709-3 |
| Lead | 2.1 | 2.0 | 105. | 75.-125. | Laboratory Control Sample | 1060709-2 |
| Lead | 0.1 | 0.1 | 100. | 75.-125. | Continuing Calibration Verif. | 1060709-3 |
| Nickel | 2.1 | 2.0 | 105. | 75.-125. | Laboratory Control Sample | 1060709-2 |
| Nickel | 0.1 | 0.1 | 100. | 75.-125. | Continuing Calibration Verif. | 1060709-3 |
| Selenium | 2.0 | 2.0 | 100. | 75.-125. | Laboratory Control Sample | 1060709-2 |
| Selenium | 0.11 | 0.1 | 110. | 75.-125. | Continuing Calibration Verif. | 1060709-3 |
| Silver | 0.89 | 1.0 | 89. | 75.-125. | Laboratory Control Sample | 1060709-2 |
| Silver | 0.048 | 0.05 | 95. | 75.-125. | Continuing Calibration Verif. | 1060709-3 |
| Thallium | 2.1 | 2.0 | 105. | 75.-125. | Laboratory Control Sample | 1060709-2 |
| Thallium | 0.1 | 0.1 | 100. | 75.-125. | Continuing Calibration Verif. | 1060709-3 |
| Titanium | 2.1 | 2.0 | 105. | 75.-125. | Laboratory Control Sample | 1060709-2 |
| Titanium | 0.1 | 0.1 | 100. | 75.-125. | Continuing Calibration Verif. | 1060709-3 |
| Vanadium | 2.1 | 2.0 | 105. | 75.-125. | Laboratory Control Sample | 1060709-2 |
| Vanadium | 0.1 | 0.1 | 100. | 75.-125. | Continuing Calibration Verif. | 1060709-3 |

Results expressed as mg/L.
* Values expressed as percent values.

SCOEPA00010228

## Calibration Blank Verification Report
## For Job Number: A10621BI

Wacker Siltronic



Method: EPA 7471; Mercury by Cold Vapor Sediment or Soil.

| Analyte | Detection Limit | Blank Verification Verification Result | Data Type | Batch Identification |
|---|---|---|---|---|
| Mercury | 0.0005 | ND | Continuing Calibration Blank | 1060636-4 |
| Mercury | 0.0005 | ND | Continuing Calibration Blank | 1060636-10 |

Results expressed as mg/L.
ND means none detected at or above the detection limit listed.

SCOEPA00010229

## Calibration Verification Report
## For Job Number: A10621BI

Wacker Siltronic

Report Date: March 5, 2002


Method: EPA 7471; Mercury by Cold Vapor Sediment or Soil.

| Analyte | Verification Result | Theoretical Result | Percent Recovery | Percent Recovery Control Limit | Data Type | Batch Identification |
|---|---|---|---|---|---|---|
| Mercury | 0.5 | 0.5 | 100. | 80.-120. | Continuing Calibration Verif. | 1060636-3 |
| Mercury | 0.4 | 0.5 | 80. | 80.-120. | Continuing Calibration Verif. | 1060636-9 |

Results expressed as mg/L.

SCOEPA00010230

## Calibration Blank Verification Report
## For Job Number: A10621BI

Wacker Siltronic

Report Date: March 5, 2002


Method: EPA 8260; Volatile Organics by GC/MS.

| Analyte | Detection Limit | Blank Verification Verification Result | Data Type | Batch Identification |
|---|---|---|---|---|
| Acetone | 15. | ND | Continuing Calibration Blank | 1060688-4 |
| Benzene | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| Bromobenzene | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| Bromochloromethane | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| Bromodichloromethane | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| Bromoform | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| Bromomethane | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| 2-Butanone (MEK) | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| n-Butylbenzene | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| sec-Butylbenzene | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| tert-Butylbenzene | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| Carbon Disulfide | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| Carbon tetrachloride | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| Chlorobenzene | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| Chloroethane | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| 2-Chloroethylvinyl ether | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| Chloroform | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| Chloromethane | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| 2-Chlorotoluene | 5. | ND | Continuing Calibration Blank | 1060688-4 |

Results expressed as $\mu$g/L.
ND means none detected at or above the detection limit listed.

SCOEPA00010231

## Calibration Blank Verification Report
## For Job Number: A10621BI

Wacker Siltronic

Report Date: March 5, 2002


Method: EPA 8260; Volatile Organics by GC/MS.

| Analyte | Detection Limit | Blank Verification Verification Result | Data Type | Batch Identification |
|---|---|---|---|---|
| 4-Chlorotoluene | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| 1,2-Dibromo-3-chloropropane | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| Dibromochloromethane | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| 1,2-Dibromoethane | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| Dibromomethane | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| 1,2-Dichlorobenzene | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| 1,3-Dichlorobenzene | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| 1,4-Dichlorobenzene | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| Dichlorodifluoromethane | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| 1,1-Dichloroethane | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| 1,2-Dichloroethane | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| 1,1-Dichloroethene | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| cis-1,2-Dichloroethene | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| trans-1,2-Dichloroethene | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| 1,2-Dichloropropane | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| 1,3-Dichloropropane | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| 2,2-Dichloropropane | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| 1,1-Dichloropropene | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| cis-1,3-Dichloropropene | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| trans-1,3-Dichloropropene | 5. | ND | Continuing Calibration Blank | 1060688-4 |

Results expressed as $\mu$g/L.
ND means none detected at or above the detection limit listed.

SCOEPA00010232

## Calibration Blank Verification Report
## For Job Number: A10621BI

Wacker Siltronic



Method: EPA 8260; Volatile Organics by GC/MS.

| Analyte | Detection Limit | Blank Verification Verification Result | Data Type | Batch Identification |
|---|---|---|---|---|
| Ethylbenzene | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| Hexachlorobutadiene | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| 2-Hexanone | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| Iodomethane | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| Isopropylbenzene | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| 4-Isopropyltoluene | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| 4-Methyl-2-pentanone | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| Methylene chloride | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| Naphthalene | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| n-Propylbenzene | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| Styrene | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| 1,1,1,2-Tetrachloroethane | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| 1,1,2,2-Tetrachloroethane | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| Tetrachloroethene | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| Toluene | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| 1,2,3-Trichlorobenzene | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| 1,2,4-Trichlorobenzene | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| 1,1,1-Trichloroethane | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| 1,1,2-Trichloroethane | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| Trichloroethene | 5. | ND | Continuing Calibration Blank | 1060688-4 |

Results expressed as $\mu$g/L.
ND means none detected at or above the detection limit listed.

SCOEPA00010233

## Calibration Blank Verification Report
## For Job Number: A10621BI

Wacker Siltronic

Report Date: March 5, 2002


Method: EPA 8260; Volatile Organics by GC/MS.

| Analyte | Detection Limit | Blank Verification Verification Result | Data Type | Batch Identification |
|---|---|---|---|---|
| Trichlorofluoromethane | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| 1,2,3-Trichloropropane | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| 1,2,4-Trimethylbenzene | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| 1,3,5-Trimethylbenzene | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| Vinyl acetate | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| Vinyl chloride | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| m,p-Xylene | 10. | ND | Continuing Calibration Blank | 1060688-4 |
| o-Xylene | 5. | ND | Continuing Calibration Blank | 1060688-4 |
| 4-Bromofluorobenzene (Surr.) | --- | 101% | Continuing Calibration Blank | 1060688-4 |
| Dibromofluoromethane (Surr.) | --- | 98% | Continuing Calibration Blank | 1060688-4 |
| Toluene-d8 (Surr.) | --- | 103% | Continuing Calibration Blank | 1060688-4 |

Results expressed as µg/L.
ND means none detected at or above the detection limit listed.

SCOEPA00010234

## Calibration Verification Report
## For Job Number: A10621BI

Wacker Siltronic

Report Date: March 5, 2002


Method: EPA 8260; Volatile Organics by GC/MS.

| Analyte | Verification Result | Theoretical Result | Percent Recovery | Percent Recovery Control Limit | Data Type | Batch Identification |
|---|---|---|---|---|---|---|
| Benzene | 25. | 25. | 100. | 70.-130. | Laboratory Control Sample | 1060688-3 |
| Bromodichloromethane | 24. | 25. | 96. | 70.-130. | Laboratory Control Sample | 1060688-3 |
| Bromoform | 25. | 25. | 100. | 70.-130. | Laboratory Control Sample | 1060688-3 |
| Bromomethane | 26. | 25. | 104. | 70.-130. | Laboratory Control Sample | 1060688-3 |
| Carbon tetrachloride | 25. | 25. | 100. | 70.-130. | Laboratory Control Sample | 1060688-3 |
| Chlorobenzene | 24. | 25. | 96. | 70.-130. | Laboratory Control Sample | 1060688-3 |
| Chloroethane | 28. | 25. | 112. | 70.-130. | Laboratory Control Sample | 1060688-3 |
| Chloroform | 23. | 25. | 94. | 70.-130. | Laboratory Control Sample | 1060688-3 |
| Chloromethane | 21. | 25. | 84. | 70.-130. | Laboratory Control Sample | 1060688-3 |
| Dibromochloromethane | 24. | 25. | 96. | 70.-130. | Laboratory Control Sample | 1060688-3 |
| 1,2-Dichlorobenzene | 24. | 25. | 96. | 70.-130. | Laboratory Control Sample | 1060688-3 |
| 1,3-Dichlorobenzene | 25. | 25. | 100. | 70.-130. | Laboratory Control Sample | 1060688-3 |
| 1,4-Dichlorobenzene | 25. | 25. | 100. | 70.-130. | Laboratory Control Sample | 1060688-3 |
| 1,1-Dichloroethane | 25. | 25. | 100. | 70.-130. | Laboratory Control Sample | 1060688-3 |
| 1,2-Dichloroethane | 24. | 25. | 96. | 70.-130. | Laboratory Control Sample | 1060688-3 |
| 1,1-Dichloroethene | 27. | 25. | 108. | 70.-130. | Laboratory Control Sample | 1060688-3 |
| trans-1,2-Dichloroethene | 25. | 25. | 100. | 70.-130. | Laboratory Control Sample | 1060688-3 |
| 1,2-Dichloropropane | 26. | 25. | 104. | 70.-130. | Laboratory Control Sample | 1060688-3 |
| cis-1,3-Dichloropropene | 27. | 25. | 108. | 70.-130. | Laboratory Control Sample | 1060688-3 |
| trans-1,3-Dichloropropene | 27. | 25. | 108. | 70.-130. | Laboratory Control Sample | 1060688-3 |
| Ethylbenzene | 24. | 25. | 96. | 70.-130. | Laboratory Control Sample | 1060688-3 |

Results expressed as $\mu$g/L.

SCOEPA00010235

## Calibration Verification Report
## For Job Number: A10621BI

Wacker Siltronic



Method: EPA 8260; Volatile Organics by GC/MS.

| Analyte | Verification Result | Theoretical Result | Percent Recovery | Percent Recovery Control Limit | Data Type | Batch Identification |
|---|---|---|---|---|---|---|
| Methylene chloride | 19. | 25. | 75. | 70.-130. | Laboratory Control Sample | 1060688-3 |
| 1,1,2,2-Tetrachloroethane | 24. | 25. | 96. | 70.-130. | Laboratory Control Sample | 1060688-3 |
| Tetrachloroethene | 26. | 25. | 104. | 70.-130. | Laboratory Control Sample | 1060688-3 |
| Toluene | 25. | 25. | 100. | 70.-130. | Laboratory Control Sample | 1060688-3 |
| 1,1,1-Trichloroethane | 24. | 25. | 96. | 70.-130. | Laboratory Control Sample | 1060688-3 |
| 1,1,2-Trichloroethane | 25. | 25. | 100. | 70.-130. | Laboratory Control Sample | 1060688-3 |
| Trichloroethene | 26. | 25. | 104. | 70.-130. | Laboratory Control Sample | 1060688-3 |
| Trichlorofluoromethane | 22. | 25. | 88. | 70.-130. | Laboratory Control Sample | 1060688-3 |
| Vinyl chloride | 26. | 25. | 104. | 70.-130. | Laboratory Control Sample | 1060688-3 |
| 4-Bromofluorobenzene (Surr.) | | | 100% | 70.-130. | Laboratory Control Sample | 1060688-3 |
| Dibromofluoromethane (Surr.) | | | 93% | 70.-130. | Laboratory Control Sample | 1060688-3 |
| Toluene-d8 (Surr.) | | | 100% | 70.-130. | Laboratory Control Sample | 1060688-3 |

Results expressed as $\mu$g/L.



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## Calibration Blank Verification Report
## For Job Number: A10621BI

Wacker Siltronic



Method: EPA 8270; Semivolatile Organics by GC/MS.

| Analyte | Detection Limit | Blank Verification Verification Result | Data Type | Batch Identification |
|---|---|---|---|---|
| Acenaphthene | 0.006 | ND | Extraction Blank | 1060672-3 |
| Acenaphthylene | 0.006 | ND | Extraction Blank | 1060672-3 |
| Aldrin | 0.006 | ND | Extraction Blank | 1060672-3 |
| Anthracene | 0.006 | ND | Extraction Blank | 1060672-3 |
| Benzo(a)anthracene | 0.006 | ND | Extraction Blank | 1060672-3 |
| Benzo(a)pyrene | 0.006 | ND | Extraction Blank | 1060672-3 |
| Benzo(b)fluoranthene | 0.006 | ND | Extraction Blank | 1060672-3 |
| Benzo(g,h,i)perylene | 0.006 | ND | Extraction Blank | 1060672-3 |
| Benzo(k)fluoranthene | 0.006 | ND | Extraction Blank | 1060672-3 |
| beta-BHC | 0.006 | ND | Extraction Blank | 1060672-3 |
| delta-BHC | 0.006 | ND | Extraction Blank | 1060672-3 |
| bis(2-Chloroethoxy)methane | 0.006 | ND | Extraction Blank | 1060672-3 |
| bis(2-Chloroethyl)ether | 0.006 | ND | Extraction Blank | 1060672-3 |
| bis(2-Chloroisopropyl)ether | 0.006 | ND | Extraction Blank | 1060672-3 |
| Bis(2-ethylhexyl)phthalate | 0.006 | ND | Extraction Blank | 1060672-3 |
| 4-Bromophenyl phenyl ether | 0.006 | ND | Extraction Blank | 1060672-3 |
| Butyl benzyl phthalate | 0.006 | ND | Extraction Blank | 1060672-3 |
| 4-Chloro-3-methylphenol | 0.006 | ND | Extraction Blank | 1060672-3 |
| 2-Chloronaphthalene | 0.006 | ND | Extraction Blank | 1060672-3 |

Results expressed as mg/L.
ND means none detected at or above the detection limit listed.

SCOEPA00010237

## Calibration Blank Verification Report
## For Job Number: A10621BI

Wacker Siltronic



Method: EPA 8270; Semivolatile Organics by GC/MS.

| Analyte | Detection Limit | Blank Verification Verification Result | Data Type | Batch Identification |
|---|---|---|---|---|
| 2-Chlorophenol | 0.006 | ND | Extraction Blank | 1060672-3 |
| 4-Chlorophenyl phenyl ether | 0.006 | ND | Extraction Blank | 1060672-3 |
| Chrysene | 0.006 | ND | Extraction Blank | 1060672-3 |
| 4,4-DDD | 0.006 | ND | Extraction Blank | 1060672-3 |
| 4,4-DDE | 0.006 | ND | Extraction Blank | 1060672-3 |
| 4,4-DDT | 0.006 | ND | Extraction Blank | 1060672-3 |
| Di-n-butylphthalate | 0.006 | ND | Extraction Blank | 1060672-3 |
| Di-n-octylphthalate | 0.006 | ND | Extraction Blank | 1060672-3 |
| Dibenzo(a,h)anthracene | 0.006 | ND | Extraction Blank | 1060672-3 |
| 1,2-Dichlorobenzene | 0.006 | ND | Extraction Blank | 1060672-3 |
| 1,4-Dichlorobenzene | 0.006 | ND | Extraction Blank | 1060672-3 |
| 1,3-Dichlorobenzene | 0.006 | ND | Extraction Blank | 1060672-3 |
| 2,4-Dichlorophenol | 0.006 | ND | Extraction Blank | 1060672-3 |
| Dieldrin | 0.006 | ND | Extraction Blank | 1060672-3 |
| Diethyl phthalate | 0.006 | ND | Extraction Blank | 1060672-3 |
| 2,4-Dimethylphenol | 0.006 | ND | Extraction Blank | 1060672-3 |
| Dimethylphthalate | 0.006 | ND | Extraction Blank | 1060672-3 |
| 2,4-Dinitrophenol | 0.012 | ND | Extraction Blank | 1060672-3 |
| 2,4-Dinitrotoluene | 0.006 | ND | Extraction Blank | 1060672-3 |
| 2,6-Dinitrotoluene | 0.006 | ND | Extraction Blank | 1060672-3 |

Results expressed as mg/L.
ND means none detected at or above the detection limit listed.

SCOEPA00010238

## Calibration Blank Verification Report
## For Job Number: A10621BI

Wacker Siltronic



Method: EPA 8270; Semivolatile Organics by GC/MS.

| Analyte | Detection Limit | Blank Verification Verification Result | Data Type | Batch Identification |
|---|---|---|---|---|
| Endosulfan sulfate | 0.006 | ND | Extraction Blank | 1060672-3 |
| Endrin Aldehyde | 0.006 | ND | Extraction Blank | 1060672-3 |
| Fluoranthene | 0.006 | ND | Extraction Blank | 1060672-3 |
| Fluorene | 0.006 | ND | Extraction Blank | 1060672-3 |
| Heptachlor | 0.006 | ND | Extraction Blank | 1060672-3 |
| Heptachlor epoxide | 0.006 | ND | Extraction Blank | 1060672-3 |
| Hexachlorobenzene | 0.006 | ND | Extraction Blank | 1060672-3 |
| Hexachlorobutadiene | 0.006 | ND | Extraction Blank | 1060672-3 |
| Hexachloroethane | 0.006 | ND | Extraction Blank | 1060672-3 |
| Indeno(1,2,3-cd)pyrene | 0.006 | ND | Extraction Blank | 1060672-3 |
| Isophorone | 0.006 | ND | Extraction Blank | 1060672-3 |
| 2-Methyl-4,6-dinitrophenol | 0.006 | ND | Extraction Blank | 1060672-3 |
| N-Nitrosodi-n-propylamine | 0.006 | ND | Extraction Blank | 1060672-3 |
| Naphthalene | 0.006 | ND | Extraction Blank | 1060672-3 |
| Nitrobenzene | 0.006 | ND | Extraction Blank | 1060672-3 |
| 4-Nitrophenol | 0.006 | ND | Extraction Blank | 1060672-3 |
| 2-Nitrophenol | 0.006 | ND | Extraction Blank | 1060672-3 |
| Pentachlorophenol | 0.006 | ND | Extraction Blank | 1060672-3 |
| Phenanthrene | 0.006 | ND | Extraction Blank | 1060672-3 |
| Phenol | 0.006 | ND | Extraction Blank | 1060672-3 |

Results expressed as mg/L.
ND means none detected at or above the detection limit listed.

SCOEPA00010239

## Calibration Blank Verification Report
## For Job Number: A10621BI

Wacker Siltronic



Method: EPA 8270; Semivolatile Organics by GC/MS.

| Analyte | Detection Limit | Blank Verification Verification Result | Data Type | Batch Identification |
|---|---|---|---|---|
| Pyrene | 0.006 | ND | Extraction Blank | 1060672-3 |
| 1,2,4-Trichlorobenzene | 0.006 | ND | Extraction Blank | 1060672-3 |
| 2,4,6-Trichlorophenol | 0.006 | ND | Extraction Blank | 1060672-3 |
| 2-Fluorobiphenyl (Surr.) | --- | 95% | Extraction Blank | 1060672-3 |
| 2-Fluorophenol (Surr.) | --- | 55% | Extraction Blank | 1060672-3 |
| Nitrobenzene-d5 (Surr.) | --- | 85% | Extraction Blank | 1060672-3 |
| Phenol-d6 (Surr.) | --- | 38% | Extraction Blank | 1060672-3 |
| Terphenyl-d14 (Surr.) | --- | 115% | Extraction Blank | 1060672-3 |
| 2,4,6-Tribromophenol (Surr.) | --- | 70% | Extraction Blank | 1060672-3 |

Results expressed as mg/L.
ND means none detected at or above the detection limit listed.

SCOEPA00010240

## Calibration Blank Verification Report
## For Job Number: A10621BI

Wacker Siltronic



Method: EPA 8270; Semivolatile Organics by GC/MS.

| Analyte | Detection Limit | Blank Verification Verification Result | Data Type | Batch Identification |
|---|---|---|---|---|
| Acenaphthene | 0.3 | ND | Extraction Blank | 1060721-3 |
| Acenaphthylene | 0.3 | ND | Extraction Blank | 1060721-3 |
| Aldrin | 0.3 | ND | Extraction Blank | 1060721-3 |
| Anthracene | 0.3 | ND | Extraction Blank | 1060721-3 |
| Benzo(a)anthracene | 0.3 | ND | Extraction Blank | 1060721-3 |
| Benzo(a)pyrene | 0.3 | ND | Extraction Blank | 1060721-3 |
| Benzo(b)fluoranthene | 0.3 | ND | Extraction Blank | 1060721-3 |
| Benzo(g,h,i)perylene | 0.3 | ND | Extraction Blank | 1060721-3 |
| Benzo(k)fluoranthene | 0.3 | ND | Extraction Blank | 1060721-3 |
| beta-BHC | 0.3 | ND | Extraction Blank | 1060721-3 |
| delta-BHC | 0.3 | ND | Extraction Blank | 1060721-3 |
| bis(2-Chloroethoxy)methane | 0.3 | ND | Extraction Blank | 1060721-3 |
| bis(2-Chloroethyl)ether | 0.3 | ND | Extraction Blank | 1060721-3 |
| bis(2-Chloroisopropyl)ether | 0.3 | ND | Extraction Blank | 1060721-3 |
| Bis(2-ethylhexyl)phthalate | 2. | ND | Extraction Blank | 1060721-3 |
| 4-Bromophenyl phenyl ether | 0.3 | ND | Extraction Blank | 1060721-3 |
| Butyl benzyl phthalate | 1. | ND | Extraction Blank | 1060721-3 |
| 4-Chloro-3-methylphenol | 0.3 | ND | Extraction Blank | 1060721-3 |
| 2-Chloronaphthalene | 0.3 | ND | Extraction Blank | 1060721-3 |

Results expressed as mg/Kg.
ND means none detected at or above the detection limit listed.

SCOEPA0010241

## Calibration Blank Verification Report
## For Job Number: A10621BI

Wacker Siltronic



Method: EPA 8270; Semivolatile Organics by GC/MS.

| Analyte | Detection Limit | Blank Verification Verification Result | Data Type | Batch Identification |
|---|---|---|---|---|
| 2-Chlorophenol | 0.3 | ND | Extraction Blank | 1060721-3 |
| 4-Chlorophenyl phenyl ether | 0.3 | ND | Extraction Blank | 1060721-3 |
| Chrysene | 0.3 | ND | Extraction Blank | 1060721-3 |
| 4,4-DDD | 0.3 | ND | Extraction Blank | 1060721-3 |
| 4,4-DDE | 0.3 | ND | Extraction Blank | 1060721-3 |
| 4,4-DDT | 0.3 | ND | Extraction Blank | 1060721-3 |
| Di-n-butylphthalate | 3. | ND | Extraction Blank | 1060721-3 |
| Di-n-octylphthalate | 0.3 | ND | Extraction Blank | 1060721-3 |
| Dibenzo(a,h)anthracene | 0.3 | ND | Extraction Blank | 1060721-3 |
| 1,2-Dichlorobenzene | 0.3 | ND | Extraction Blank | 1060721-3 |
| 1,4-Dichlorobenzene | 0.3 | ND | Extraction Blank | 1060721-3 |
| 1,3-Dichlorobenzene | 0.3 | ND | Extraction Blank | 1060721-3 |
| 2,4-Dichlorophenol | 0.3 | ND | Extraction Blank | 1060721-3 |
| Dieldrin | 0.3 | ND | Extraction Blank | 1060721-3 |
| Diethyl phthalate | 0.3 | ND | Extraction Blank | 1060721-3 |
| 2,4-Dimethylphenol | 0.3 | ND | Extraction Blank | 1060721-3 |
| Dimethylphthalate | 0.3 | ND | Extraction Blank | 1060721-3 |
| 2,4-Dinitrophenol | 0.6 | ND | Extraction Blank | 1060721-3 |
| 2,4-Dinitrotoluene | 0.3 | ND | Extraction Blank | 1060721-3 |
| 2,6-Dinitrotoluene | 0.3 | ND | Extraction Blank | 1060721-3 |

Results expressed as mg/Kg.
ND means none detected at or above the detection limit listed.

SCOEPA00010242

## Calibration Blank Verification Report
## For Job Number: A10621BI

Wacker Siltronic



Method: EPA 8270; Semivolatile Organics by GC/MS.

| Analyte | Detection Limit | Blank Verification Verification Result | Data Type | Batch Identification |
|---|---|---|---|---|
| Endosulfan sulfate | 0.3 | ND | Extraction Blank | 1060721-3 |
| Endrin Aldehyde | 0.3 | ND | Extraction Blank | 1060721-3 |
| Fluoranthene | 0.3 | ND | Extraction Blank | 1060721-3 |
| Fluorene | 0.3 | ND | Extraction Blank | 1060721-3 |
| Heptachlor | 0.3 | ND | Extraction Blank | 1060721-3 |
| Heptachlor epoxide | 0.3 | ND | Extraction Blank | 1060721-3 |
| Hexachlorobenzene | 0.3 | ND | Extraction Blank | 1060721-3 |
| Hexachlorobutadiene | 0.3 | ND | Extraction Blank | 1060721-3 |
| Hexachloroethane | 0.3 | ND | Extraction Blank | 1060721-3 |
| Indeno(1,2,3-cd)pyrene | 0.3 | ND | Extraction Blank | 1060721-3 |
| Isophorone | 0.3 | ND | Extraction Blank | 1060721-3 |
| 2-Methyl-4,6-dinitrophenol | 0.3 | ND | Extraction Blank | 1060721-3 |
| N-Nitrosodi-n-propylamine | 0.3 | ND | Extraction Blank | 1060721-3 |
| Naphthalene | 0.3 | ND | Extraction Blank | 1060721-3 |
| Nitrobenzene | 0.3 | ND | Extraction Blank | 1060721-3 |
| 4-Nitrophenol | 0.3 | ND | Extraction Blank | 1060721-3 |
| 2-Nitrophenol | 0.3 | ND | Extraction Blank | 1060721-3 |
| Pentachlorophenol | 0.3 | ND | Extraction Blank | 1060721-3 |
| Phenanthrene | 0.3 | ND | Extraction Blank | 1060721-3 |
| Phenol | 0.3 | ND | Extraction Blank | 1060721-3 |

Results expressed as mg/Kg.
ND means none detected at or above the detection limit listed.



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## Calibration Blank Verification Report
## For Job Number: A10621BI

Wacker Siltronic



Method: EPA 8270; Semivolatile Organics by GC/MS.

| Analyte | Detection Limit | Blank Verification Verification Result | Data Type | Batch Identification |
|---|---|---|---|---|
| Pyrene | 0.3 | ND | Extraction Blank | 1060721-3 |
| 1,2,4-Trichlorobenzene | 0.3 | ND | Extraction Blank | 1060721-3 |
| 2,4,6-Trichlorophenol | 0.3 | ND | Extraction Blank | 1060721-3 |
| 2-Fluorobiphenyl (Surr.) | --- | 60% | Extraction Blank | 1060721-3 |
| 2-Fluorophenol (Surr.) | --- | 70% | Extraction Blank | 1060721-3 |
| Nitrobenzene-d5 (Surr.) | --- | 40% | Extraction Blank | 1060721-3 |
| Phenol-d6 (Surr.) | --- | 80% | Extraction Blank | 1060721-3 |
| Terphenyl-d14 (Surr.) | --- | 90% | Extraction Blank | 1060721-3 |
| 2,4,6-Tribromophenol (Surr.) | --- | 80% | Extraction Blank | 1060721-3 |

Results expressed as mg/Kg.
ND means none detected at or above the detection limit listed.



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## Calibration Blank Verification Report
## For Job Number: A10621BI

Wacker Siltronic



Method: EPA 8270; Semivolatile Organics by GC/MS.

| Analyte | Detection Limit | Blank Verification Verification Result | Data Type | Batch Identification |
|---|---|---|---|---|
| Azobenzene | 0.25 | ND | Extraction Blank | 1060721-53 |
| 1,2-Diphenylhydrazine | 0.25 | ND | Extraction Blank | 1060721-53 |

Results expressed as mg/Kg.
ND means none detected at or above the detection limit listed.

SCOEPA00010245

## Calibration Verification Report
## For Job Number: A10621BI

Wacker Siltronic



Method: EPA 8270; Semivolatile Organics by GC/MS.

| Analyte | Verification Result | Theoretical Result | Percent Recovery | Percent Recovery Control Limit | Data Type | Batch Identification |
|---|---|---|---|---|---|---|
| Acenaphthene | 22. | 25. | 88. | 48.-104. | Reagent Water Blank Spike | 1060721-4 |
| 4-Chloro-3-methylphenol | 21. | 25. | 84. | 26.-103. | Reagent Water Blank Spike | 1060721-4 |
| 2-Chlorophenol | 20. | 25. | 80. | 25.-102. | Reagent Water Blank Spike | 1060721-4 |
| Di-n-butylphthalate | 24. | 25. | 96. | 11.-118. | Reagent Water Blank Spike | 1060721-4 |
| 1,4-Dichlorobenzene | 19. | 25. | 76. | 28.-104. | Reagent Water Blank Spike | 1060721-4 |
| 2,4-Dinitrotoluene | 22. | 25. | 88. | 28.-89. | Reagent Water Blank Spike | 1060721-4 |
| N-Nitrosodi-n-propylamine | 26. | 25. | 104. | 41.-126. | Reagent Water Blank Spike | 1060721-4 |
| 4-Nitrophenol | 22. | 25. | 88. | 11.-114. | Reagent Water Blank Spike | 1060721-4 |
| Pentachlorophenol | 23. | 25. | 92. | 17.-109. | Reagent Water Blank Spike | 1060721-4 |
| Phenol | 21. | 25. | 84. | 26.-90. | Reagent Water Blank Spike | 1060721-4 |
| Pyrene | 22. | 25. | 88. | 35.-142. | Reagent Water Blank Spike | 1060721-4 |
| 1,2,4-Trichlorobenzene | 21. | 25. | 84. | 38.-107. | Reagent Water Blank Spike | 1060721-4 |
| 2-Fluorobiphenyl (Surr.) | 50% | | | | Reagent Water Blank Spike | 1060721-4 |
| 2-Fluorophenol (Surr.) | 80% | | | | Reagent Water Blank Spike | 1060721-4 |
| Phenol-d6 (Surr.) | 95% | | | | Reagent Water Blank Spike | 1060721-4 |
| Terphenyl-d14 (Surr.) | 90% | | | | Reagent Water Blank Spike | 1060721-4 |
| 2,4,6-Tribromophenol (Surr.) | 100% | | | | Reagent Water Blank Spike | 1060721-4 |
| Nitrobenzene (Surr.) | 38% | | | | | |

Results expressed as mg/Kg.

Contol limits are based on contract laboratory practice (CLP) guidance.

SCOEPA00010246

## Calibration Blank Verification Report
## For Job Number: A10621BI

Wacker Siltronic



Method: EPA 8270 SIM; Polynuclear Aromatic Hydrocarbons by SIM GC/MS

| Analyte | Detection Limit | Blank Verification Verification Result | Data Type | Batch Identification |
|---|---|---|---|---|
| Acenaphthene | 0.1 | ND | Extraction Blank | 1060722-9 |
| Acenaphthylene | 0.1 | ND | Extraction Blank | 1060722-9 |
| Anthracene | 0.1 | ND | Extraction Blank | 1060722-9 |
| Benzo(a)anthracene | 0.1 | ND | Extraction Blank | 1060722-9 |
| Benzo(a)pyrene | 0.1 | ND | Extraction Blank | 1060722-9 |
| Benzo(b)fluoranthene | 0.1 | ND | Extraction Blank | 1060722-9 |
| Benzo(g,h,i)perylene | 0.1 | ND | Extraction Blank | 1060722-9 |
| Benzo(k)fluoranthene | 0.1 | ND | Extraction Blank | 1060722-9 |
| Chrysene | 0.1 | ND | Extraction Blank | 1060722-9 |
| Dibenzo(a,h)anthracene | 0.1 | ND | Extraction Blank | 1060722-9 |
| Fluoranthene | 0.1 | ND | Extraction Blank | 1060722-9 |
| Fluorene | 0.1 | ND | Extraction Blank | 1060722-9 |
| Indeno(1,2,3-cd)pyrene | 0.1 | ND | Extraction Blank | 1060722-9 |
| Naphthalene | 0.1 | ND | Extraction Blank | 1060722-9 |
| Phenanthrene | 0.1 | ND | Extraction Blank | 1060722-9 |
| Pyrene | 0.1 | ND | Extraction Blank | 1060722-9 |
| Decafluorobiphenol (Surr.) | --- | 70% | Extraction Blank | 1060722-9 |

Results expressed as $\mu$g/L.
ND means none detected at or above the detection limit listed.

SCOEPA00010247

## Calibration Blank Verification Report
## For Job Number: A10621BI

Wacker Siltronic

Report Date: March 5, 2002


Method: EPA 8270 SIM; Polynuclear Aromatic Hydrocarbons by SIM GC/MS

| Analyte | Detection Limit | Blank Verification Verification Result | Data Type | Batch Identification |
|---|---|---|---|---|
| Acenaphthene | 0.017 | ND | Extraction Blank | 1060722-12 |
| Acenaphthylene | 0.017 | ND | Extraction Blank | 1060722-12 |
| Anthracene | 0.017 | ND | Extraction Blank | 1060722-12 |
| Benzo(a)anthracene | 0.017 | ND | Extraction Blank | 1060722-12 |
| Benzo(a)pyrene | 0.017 | ND | Extraction Blank | 1060722-12 |
| Benzo(b)fluoranthene | 0.017 | ND | Extraction Blank | 1060722-12 |
| Benzo(g,h,i)perylene | 0.017 | ND | Extraction Blank | 1060722-12 |
| Benzo(k)fluoranthene | 0.017 | ND | Extraction Blank | 1060722-12 |
| Chrysene | 0.017 | ND | Extraction Blank | 1060722-12 |
| Dibenzo(a,h)anthracene | 0.017 | ND | Extraction Blank | 1060722-12 |
| Fluoranthene | 0.017 | ND | Extraction Blank | 1060722-12 |
| Fluorene | 0.017 | ND | Extraction Blank | 1060722-12 |
| Indeno(1,2,3-cd)pyrene | 0.017 | ND | Extraction Blank | 1060722-12 |
| Naphthalene | 0.017 | ND | Extraction Blank | 1060722-12 |
| Phenanthrene | 0.017 | ND | Extraction Blank | 1060722-12 |
| Pyrene | 0.017 | ND | Extraction Blank | 1060722-12 |
| Decafluorobiphenol (Surr.) | --- | 97% | Extraction Blank | 1060722-12 |

Results expressed as mg/Kg.
ND means none detected at or above the detection limit listed.

SCOEPA00010248

## Calibration Verification Report
## For Job Number: A10621BI

Wacker Siltronic



Method: EPA 8270 SIM; Polynuclear Aromatic Hydrocarbons by SIM GC/MS

| Analyte | Verification Result | Theoretical Result | Percent Recovery | Percent Recovery Control Limit | Data Type | Batch Identification |
|---|---|---|---|---|---|---|
| Acenaphthene | 0.4 | 0.4 | 100. | 50.-150. | Reagent Water Blank Spike | 1060722-10 |
| Acenaphthylene | 0.4 | 0.4 | 100. | 50.-150. | Reagent Water Blank Spike | 1060722-10 |
| Anthracene | 0.4 | 0.4 | 100. | 50.-150. | Reagent Water Blank Spike | 1060722-10 |
| Benzo(a)anthracene | 0.4 | 0.4 | 100. | 50.-150. | Reagent Water Blank Spike | 1060722-10 |
| Benzo(a)pyrene | 0.4 | 0.4 | 100. | 50.-150. | Reagent Water Blank Spike | 1060722-10 |
| Benzo(b)fluoranthene | 0.5 | 0.4 | 125. | 50.-150. | Reagent Water Blank Spike | 1060722-10 |
| Benzo(g,h,i)perylene | 0.6 | 0.4 | 150. | 50.-150. | Reagent Water Blank Spike | 1060722-10 |
| Benzo(k)fluoranthene | 0.4 | 0.4 | 100. | 50.-150. | Reagent Water Blank Spike | 1060722-10 |
| Chrysene | 0.4 | 0.4 | 100. | 50.-150. | Reagent Water Blank Spike | 1060722-10 |
| Dibenzo(a,h)anthracene | 0.5 | 0.4 | 125. | 50.-150. | Reagent Water Blank Spike | 1060722-10 |
| Fluoranthene | 0.4 | 0.4 | 100. | 50.-150. | Reagent Water Blank Spike | 1060722-10 |
| Fluorene | 0.4 | 0.4 | 100. | 50.-150. | Reagent Water Blank Spike | 1060722-10 |
| Indeno(1,2,3-cd)pyrene | 0.5 | 0.4 | 125. | 50.-150. | Reagent Water Blank Spike | 1060722-10 |
| Naphthalene | 0.4 | 0.4 | 100. | 50.-150. | Reagent Water Blank Spike | 1060722-10 |
| Phenanthrene | 0.4 | 0.4 | 100. | 50.-150. | Reagent Water Blank Spike | 1060722-10 |
| Pyrene | 0.5 | 0.4 | 125. | 50.-150. | Reagent Water Blank Spike | 1060722-10 |
| Decafluorobiphenol (Surr.) | 80% | | | | Reagent Water Blank Spike | 1060722-10 |

Results expressed as µg/L.

SCOEPA00010249

## Calibration Verification Report
## For Job Number: A10621BI

Wacker Siltronic



Method: EPA 8270 SIM; Polynuclear Aromatic Hydrocarbons by SIM GC/MS

| Analyte | Verification Result | Theoretical Result | Percent Recovery | Percent Recovery Control Limit | Data Type | Batch Identification |
|---|---|---|---|---|---|---|
| Acenaphthene | 0.03 | 0.026 | 115. | 50.-150. | Reagent Water Blank Spike | 1060722-13 |
| Acenaphthylene | 0.03 | 0.026 | 115. | 50.-150. | Reagent Water Blank Spike | 1060722-13 |
| Anthracene | 0.02 | 0.026 | 78. | 50.-150. | Reagent Water Blank Spike | 1060722-13 |
| Benzo(a)anthracene | 0.03 | 0.026 | 115. | 50.-150. | Reagent Water Blank Spike | 1060722-13 |
| Benzo(a)pyrene | 0.02 | 0.026 | 78. | 50.-150. | Reagent Water Blank Spike | 1060722-13 |
| Benzo(b)fluoranthene | 0.03 | 0.026 | 115. | 50.-150. | Reagent Water Blank Spike | 1060722-13 |
| Benzo(g,h,i)perylene | 0.04 | 0.026 | 150. | 50.-150. | Reagent Water Blank Spike | 1060722-13 |
| Benzo(k)fluoranthene | 0.02 | 0.026 | 78. | 50.-150. | Reagent Water Blank Spike | 1060722-13 |
| Chrysene | 0.03 | 0.026 | 115. | 50.-150. | Reagent Water Blank Spike | 1060722-13 |
| Dibenzo(a,h)anthracene | 0.03 | 0.026 | 115. | 50.-150. | Reagent Water Blank Spike | 1060722-13 |
| Fluoranthene | 0.03 | 0.026 | 115. | 50.-150. | Reagent Water Blank Spike | 1060722-13 |
| Fluorene | 0.03 | 0.026 | 115. | 50.-150. | Reagent Water Blank Spike | 1060722-13 |
| Indeno(1,2,3-cd)pyrene | 0.03 | 0.026 | 115. | 50.-150. | Reagent Water Blank Spike | 1060722-13 |
| Naphthalene | 0.03 | 0.026 | 115. | 50.-150. | Reagent Water Blank Spike | 1060722-13 |
| Phenanthrene | 0.03 | 0.026 | 115. | 50.-150. | Reagent Water Blank Spike | 1060722-13 |
| Pyrene | 0.03 | 0.026 | 115. | 50.-150. | Reagent Water Blank Spike | 1060722-13 |
| Decafluorobiphenol (Surr.) | 90% | | | | Reagent Water Blank Spike | 1060722-13 |

Results expressed as mg/Kg.

SCOEPA00010250

## Calibration Blank Verification Report
## For Job Number: A10621BI

Wacker Siltronic

Report Date: March 5, 2002


Method: NW TPH-Dx; TPH quantitative semi-volatile petroleum products

| Analyte | Detection Limit | Blank Verification Verification Result | Data Type | Batch Identification |
|---|---|---|---|---|
| Diesel | 50. | ND | Extraction Blank | 1060787-1 |
| Hydrocarbons heavier than C24 | 100. | ND | Extraction Blank | 1060787-1 |
| o-Terphenyl (Surr.) | --- | 110.% | Extraction Blank | 1060787-1 |

Results expressed as mg/Kg.
ND means none detected at or above the detection limit listed.

SCOEPA00010251

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## Calibration Blank Verification Report
## For Job Number: A10621BI

Wacker Siltronic



Method: NW TPH-Dx; TPH quantitative semi-volatile petroleum products

| Analyte | Detection Limit | Blank Verification Verification Result | Data Type | Batch Identification |
|---|---|---|---|---|
| Diesel | 0.12 | ND | Extraction Blank | 1060787-6 |
| Hydrocarbons heavier than C24 | 0.25 | ND | Extraction Blank | 1060787-6 |
| o-Terphenyl (Surr.) | --- | 90.% | Extraction Blank | 1060787-6 |

Results expressed as mg/L.
ND means none detected at or above the detection limit listed.

SCOEPA00010252

**Sample Duplicate, Matrix Spike & Matrix Spike Duplicate**
**Summary Report**

**Coffey Laboratories, Inc.**
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**Quality Control Report**
**For Job Number: A10621BI**

Wacker Siltronic

Report Date: March 5, 2002


Lab Sample ID: A10621BI-3
Field ID: CLI Composite 1-2
Date/Time: 06/19/01 COMP
Matrix: Soil

| Analyte | Batch ID | Method Number | Sample Result | Duplicate Result | RPD | Control Limit |
|---|---|---|---|---|---|---|
| Total Organic Carbon | 1070042-2 | EPA 415.1 | 13000.E | 10000.E | 26.* | <20. |

Results expressed as mg/Kg.
ND means none detected at or above the detection limit listed. NA means "Not Applicable".
RPD means "Relative Percent Difference".
* Outside the quality control limit, however, both results are estimated concentrations above the calibration curve.

SCOEPA00010254

**COFFEY LABORATORIES, INC.**
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**Quality Control Report**
**For Job Number: A10621BI**

Wacker Siltronic

Report Date: March 5, 2002


Lab Sample ID: A10621BI-3
Field ID: CLI Composite 1-2
Date/Time: 06/19/01 COMP
Matrix: Soil

| Analyte | Batch ID | Method Number | Sample Result | Duplicate Result | RPD | Control Limit |
|---|---|---|---|---|---|---|
| Acenaphthene | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Acenaphthylene | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Aldrin | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Anthracene | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Benzo(a)anthracene | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Benzo(a)pyrene | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Benzo(b)fluoranthene | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Benzo(g,h,i)perylene | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Benzo(k)fluoranthene | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| beta-BHC | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| delta-BHC | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| bis(2-Chloroethoxy)methane | 1060721-5 | EPA 8270 | ND | ND | NA | <30 |
| bis(2-Chloroethyl)ether | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| bis(2-Chloroisopropyl)ether | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Bis(2-ethylhexyl)phthalate | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| 4-Bromophenyl phenyl ether | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Butyl benzyl phthalate | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |

Results expressed as mg/Kg.
ND means none detected at or above the detection limit listed. NA means "Not Applicable".
RPD means "Relative Percent Difference".



**COFFEY LABORATORIES, INC.**
12423 N.E. Whitaker Way • Portland, OR • 97230 • (503) 254-1794 • FAX (503) 254-1452

**Quality Control Report**
**For Job Number: A10621BI**

Wacker Siltronic



Lab Sample ID: A10621BI-3
Field ID: CLI Composite 1-2
Date/Time: 06/19/01 COMP
Matrix: Soil

| Analyte | Batch ID | Method Number | Sample Result | Duplicate Result | RPD | Control Limit |
|---|---|---|---|---|---|---|
| 4-Chloro-3-methylphenol | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| 2-Chloronaphthalene | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| 2-Chlorophenol | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| 4-Chlorophenyl phenyl ether | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Chrysene | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| 4,4-DDD | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| 4,4-DDE | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| 4,4-DDT | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Di-n-butylphthalate | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Di-n-octylphthalate | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Dibenzo(a,h)anthracene | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| 1,2-Dichlorobenzene | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| 1,4-Dichlorobenzene | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| 1,3-Dichlorobenzene | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| 2,4-Dichlorophenol | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Dieldrin | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Diethyl phthalate | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| 2,4-Dimethylphenol | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |

Results expressed as mg/Kg.
ND means none detected at or above the detection limit listed. NA means "Not Applicable".
RPD means "Relative Percent Difference".



**COFFEY LABORATORIES, INC.**
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**Quality Control Report**
**For Job Number: A10621BI**

Wacker Siltronic

Report Date: March 5, 2002


Lab Sample ID: A10621BI-3
Field ID: CLI Composite 1-2
Date/Time: 06/19/01 COMP
Matrix: Soil

| Analyte | Batch ID | Method Number | Sample Result | Duplicate Result | RPD | Control Limit |
|---|---|---|---|---|---|---|
| Dimethylphthalate | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| 2,4-Dinitrophenol | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| 2,4-Dinitrotoluene | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| 2,6-Dinitrotoluene | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Endosulfan sulfate | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Endrin Aldehyde | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Fluoranthene | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Fluorene | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Heptachlor | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Heptachlor epoxide | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Hexachlorobenzene | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Hexachlorobutadiene | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Hexachloroethane | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Indeno(1,2,3-cd)pyrene | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Isophorone | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| 2-Methyl-4,6-dinitrophenol | 1060721-5 | EPA 8270 | ND | ND | NA | <30 |
| N-Nitrosodi-n-propylamine | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Naphthalene | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |

Results expressed as mg/Kg.
ND means none detected at or above the detection limit listed. NA means "Not Applicable".
RPD means "Relative Percent Difference".



**COFFEY LABORATORIES, INC.**
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**Quality Control Report**
**For Job Number: A10621BI**

Wacker Siltronic

Report Date: March 5, 2002


Lab Sample ID: A10621BI-3
Field ID: CLI Composite 1-2
Date/Time: 06/19/01 COMP
Matrix: Soil

| Analyte | Batch ID | Method Number | Sample Result | Duplicate Result | RPD | Control Limit |
|---|---|---|---|---|---|---|
| Nitrobenzene | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| 4-Nitrophenol | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| 2-Nitrophenol | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Pentachlorophenol | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Phenanthrene | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Phenol | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Pyrene | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| 1,2,4-Trichlorobenzene | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| 2,4,6-Trichlorophenol | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| Azobenzene | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| 1,2-Diphenylhydrazine | 1060721-5 | EPA 8270 | ND | ND | NA | <30. |
| 2-Fluorobiphenyl (Surr.) | 1060721-5 | EPA 8270 | Diluted | Diluted | NA | -- |
| 2-Fluorophenol (Surr.) | 1060721-5 | EPA 8270 | Diluted | Diluted | NA | -- |
| Nitrobenzene-d5 (Surr.) | 1060721-5 | EPA 8270 | Diluted | Diluted | NA | -- |
| Phenol-d6 (Surr.) | 1060721-5 | EPA 8270 | Diluted | Diluted | NA | -- |
| Terphenyl-d14 (Surr.) | 1060721-5 | EPA 8270 | Diluted | Diluted | NA | -- |
| 2,4,6-Tribromophenol (Surr.) | 1060721-5 | EPA 8270 | Diluted | Diluted | NA | -- |

Results expressed as mg/Kg.
ND means none detected at or above the detection limit listed. NA means "Not Applicable".
RPD means "Relative Percent Difference".

SCOEPA00010258

## Quality Control Report
## For Job Number: A10621BI

Wacker Siltronic

Report Date: March 5, 2002


Lab Sample ID: N/A
Field ID: N/A
Date/Time: N/A
Matrix: Water

| Analyte | Batch ID | Sample Result | MS Result | MSD Result | Amount Spiked | RPD | Percent Recovery | Percent Recovery Control Limit | MS/MSD RPD Control Limit |
|---|---|---|---|---|---|---|---|---|---|
| Mercury* | 1060638-4 | ND | 0.5 | 0.5 | 0.5 | 0. | 100. 100. | 75.-125. | <35. |
| Total Organic Carbon* | 1060772-6 | 1.6 | 10.5 | --- | 10. | --- | 89. | 75.-125. | --- |

Results expressed as mg/L.
ND means none detected at or above the detection limit listed.
RPD means "Relative Percent Difference".
MS means "Matrix Spike". MSD means "Matrix Spike Duplicate".
*Sample used for Matrix Spike was from a different source.

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SCOEPA00010259

## Quality Control Report
## For Job Number: A10621BI

Wacker Siltronic

Report Date: March 5, 2002


Lab Sample ID: N/A
Field ID: N/A
Date/Time: N/A
Matrix: Water

| Analyte | Batch ID | Sample Result | MS Result | MSD Result | Amount Spiked | RPD | Percent Recovery | Percent Recovery Control Limit | MS/MSD RPD Control Limit |
|---|---|---|---|---|---|---|---|---|---|
| Benzene* | 1060688-10 | ND | 25. | 25. | 25. | 0. | 100. 100. | 70.-130. | ≤25. |
| Chlorobenzene* | 1060688-10 | ND | 24. | 23. | 25. | 4. | 96. 92. | 70.-130. | ≤25. |
| 1,1-Dichloroethene* | 1060688-10 | ND | 27. | 27. | 25. | 0. | 108. 108. | 70.-130. | ≤25. |
| Toluene* | 1060688-10 | 93. | 117. | 118. | 25. | 4. | 96. 100. | 70.-130. | ≤25. |
| Trichloroethene* | 1060688-10 | ND | 25. | 25. | 25. | 0. | 100. 100. | 70.-130. | ≤25. |

Results expressed as mg/L.
ND means none detected at or above the detection limit listed.
RPD means "Relative Percent Difference".
MS means "Matrix Spike". MSD means "Matrix Spike Duplicate".
*Sample used for Matrix Spike was from a different source.

SCOEPA00010260

## Quality Control Report
## For Job Number: A10621BI

Wacker Siltronic



Lab Sample ID: N/A
Field ID: N/A
Date/Time: N/A
Matrix: Water

| Analyte | Batch ID | Sample Result | MS Result | Amount Spiked | Percent Recovery | Percent Recovery Control Limit | MS/MSD RPD Control Limit |
|---|---|---|---|---|---|---|---|
| Iron* | 1060774-39 | 0.38 | 2.3 | 2. | 97. | 75.-125. | --- |
| Magnesium* | 1060774-39 | 9.9 | 12. | 2. | 100. | 75.-125. | --- |
| Manganese* | 1060774-39 | 1.1 | 3. | 2. | 94. | 75.-125. | --- |
| Antimony* | 1060693-8 | ND | 0.045 | 0.05 | 89. | 75.-125. | --- |
| Arsenic* | 1060693-8 | ND | 0.054 | 0.05 | 107. | 75.-125. | --- |
| Barium* | 1060693-8 | 0.019 | 0.069 | 0.05 | 99. | 75.-125. | --- |
| Cadmium* | 1060693-8 | ND | 0.050 | 0.05 | 100. | 75.-125. | --- |
| Chromium* | 1060693-8 | ND | 0.049 | 0.05 | 98. | 75.-125. | --- |
| Cobalt* | 1060693-8 | 0.0001 | 0.046 | 0.05 | 93. | 75.-125. | --- |
| Copper* | 1060693-8 | 0.012 | 0.057 | 0.05 | 91. | 75.-125. | --- |
| Lead* | 1060693-8 | 0.0005 | 0.051 | 0.05 | 101. | 75.-125. | --- |
| Nickel* | 1060693-8 | ND | 0.046 | 0.05 | 91. | 75.-125. | --- |
| Selenium* | 1060693-8 | ND | 0.05 | 0.05 | 100. | 75.-125. | --- |
| Silver* | 1060693-8 | ND | 0.022 | 0.025 | 88. | 75.-125. | --- |
| Thallium* | 1060693-8 | ND | 0.051 | 0.05 | 102. | 75.-125. | --- |
| Titanium* | 1060693-8 | 0.003 | 0.052 | 0.05 | 98. | 75.-125. | --- |
| Vanadium* | 1060693-8 | 0.0063 | 0.054 | 0.05 | 96. | 75.-125. | --- |
| Zinc* | 1060693-8 | 0.064 | 0.11 | 0.05 | 93. | 75.-125. | --- |

Results expressed as mg/L.
ND means none detected at or above the detection limit listed.
RPD means "Relative Percent Difference".
MS means "Matrix Spike". MSD means "Matrix Spike Duplicate".
*Sample used for Matrix Spike was from a different source.

COFFEY LABORATORIES, INC.
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SCOEPA00010261

**Quality Control Report**
**For Job Number: A10621BI**

Wacker Siltronic

Report Date: March 5, 2002


Lab Sample ID: A10621BI-3
Field ID: CLI Composite 1-2
Date/Time: 06/19/01 COMP
Matrix: Soil

| Analyte | Batch ID | Sample Result | MS Result | MSD Result | Amount Spiked | RPD | Percent Recovery | Percent Recovery Control Limit | MS/MSD RPD Control Limit |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 1060636-5 | 0.02 | 0.31 | 0.38 | 0.5 | 20. | 69.* 72.* | 75.-125. | <25. |

Results expressed as mg/Kg.
ND means none detected at or above the detection limit listed.
RPD means "Relative Percent Difference".
MS means "Matrix Spike". MSD means "Matrix Spike Duplicate".
* Outside the quality control limits indicating matrix interference.

SCOEPA00010262

**COFFEY LABORATORIES, INC.**
12423 N.E. Whitaker Way • Portland, OR • 97230 • (503) 254-1794 • FAX (503) 254-1452

**Appendix A**
**Chain of Custody**

**Coffey Laboratories, Inc.**
12423 N.E. Whitaker Way • Portland, OR • 97230 • (503) 254-1794 • FAX (503) 254-1452

# COFFEY LABORATORIES, INC.
## CHAIN OF CUSTODY AGREEMENT


CENTRAL OREGON BRANCH
827 SW 7th
Redmond, OR 97756
PHONE/FAX (541) 548-0972

CORPORATE HEADQUARTERS
12423 NE Whitaker Way
Portland, OR 97230
(503) 254-1794 FAX: (503) 254-1452

EASTERN OREGON BRANCH
419 SW 5th
Pendleton, OR 97801
PHONE/FAX (541) 276-0385


Report Attention: Tom Rothschild
Company Name: Wacker Siltronic
Mailing Address: 7200 N.W. Front Ave
Portland, OR
Phone: (503) 219-7374 FAX: (503) 417-4144

Report Instructions (Special - Additional- Job Specific):

PO Number: 4500075102
Project Number: 01-71-72
Project Name:
EPA Protocol Containers: (Y)/N Other:

**Sample Turnaround**
- [x] Standard
- [ ] Priority (Additonal Fee)
- [ ] Rush (Additional Fee)
- [ ] Emergency (Additional Fee)

Initials: Di

**Reporting Request**
- [ ] State Compliance Format
- [ ] FAX Results - Preliminary
- [x] FAX Results-Final
- [ ] Verbals Results
- [ ] Extra Report Copy (Fees Associated)

FOR LABORATORY USE ONLY Page ___ of ___
Job Number: GE410621BI-4
Custabbr: Wackersilt ☐NEW
☐ VISA ☐ M/C Cardholder:
Card #: Exp: / /
Cash / Check / CC:$ #:
Billing Code: 1 2 3 4
QC LEVEL: 1 2 3 4
FEDX BUS COURIERS UPS LAB CLIENT MAIL AIR

| Sample ID | Loc. | ID | # | Collection Date | Collection Time | Media | Analysis Requested | Test/ Profile |
|---|---|---|---|---|---|---|---|---|
| 01-71-a-b- Di | 04 | 1n | 3 | 6.19.01 | 1400 | Soil | NW-TPH Dx, EPA: 8021B, 8260B | |
| | | 2n | | | | | 8270C, 8270 SIM, 6010/200.7 * | |
| CLI Composite 1-2 | | 3n | | | | | 7470.A, 415.1 and 9010. | |
| 01-72 | | 4n | 1 | 6.19.01 | 1400 | liquid | NW-TPH Dx, EPA: 8021B, 8260B | |
| | | | | | | | 8270C, 8270 SIM, 6010/200.7* | |
| | | | | | | | 7470A, 415.1 and 9010. | |
| Run these metals per Diane Irish | | | | | | | *AgAsBaCdCrOcCuMgMn NiPbSbSeTlTiVZn - mgk | |

Sampled By: Tom McCall Jim Claxton
AUTHORIZED CUSTOMER SIGNATURE Dianne Irish DATE: June 19 - 01

| Sample Comments | Relinquished by: (Please Sign) | Date | Time | Received by: (Sign) | Date | Time |
|---|---|---|---|---|---|---|
| * See attached sheet for method detail. Please call for needed Clarification | Jim Claxton | 6/19/01 | 2:23 | Dianne Irish | 6/19/01 | 2:23 |
| | [signature] | 6/19/01 | 2.23 | LAB [signature] | 6/21/01 | 1015 |

White Copy-Laboratory Yellow Copy - Customer

COMPLETE THIS FORM PER INSTRUCTIONS ON REVERSE SIDE

**SUBMISSION OF SAMPLES WITH TESTING REQUIREMENTS TO CLI WILL BE UNDERSTOOD TO BE AN AGREEMENT FOR SERVICES IN ACCORDANCE WITH THE CONDITIONS LISTED ON THE BACK OF THE CLIENT COPY.**

# DATA PACKAGE FOR FOCUSED REMEDIAL INVESTIGATION

Wacker Siltronic Corporation Property
7200 NW Front Avenue
Portland, Oregon

November 20, 2001

Prepared for:

NW Natural
Portland, Oregon

Prepared by:

Hahn and Associates, Inc.
Portland, Oregon

HAI Project No. 5237



SCOEPA00010265

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D GeoPotential, Inc. Report entitled *Summary Report, Subsurface Mapping Survey, Wacker Siltronic Corporation, Portland, Oregon* , dated August 25, 2001





SCOEPA00010267

# TABLES

SCOEPA00010268

**TABLE 1**
**Summary of Analytical Results for Groundwater Samples: Temporary Well Points**
**Detected Volatile Organic Compounds by EPA Method 8260**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Well Point Location | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Analytical Results – ug/l (ppb) VOCs by EPA Method 8260 | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Aromatic VOCs (AVOCs) | | | | | | | | | | Halogenated VOCs (HVOCs) | | | | | | |
| | | | | Benzene | Ethylbenzene | Toluene | Xylene | Naphthalene | Chlorobenzene | 1,2-DCB | 1,3-DCB | 1,4-DCB | 1,1-DCE | cis-1,2-DCE | trans-1,2-DCE | TCE | Vinyl Chloride | Other VOCs | Total AVOCs | Total HVOCs |
| P-2 | 5237-010816-316 | 16-Aug-01 | 28-32 | 61.2 | ND> 1. | ND> 1. | 2.3 | 2.6 | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1 | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | 66.1 | ND |
| | 5237-010816-317 | 16-Aug-01 | 54-58 | 2.1 | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1 | 6.4 | ND> 1. | ND> 1. | ND> 1.2 | ND | 2.1 | 6.4 |
| | 5237-010816-318 | 16-Aug-01 | 96-100 | **117.** | 41. | 4.1 | ND> 2. | 3.8 | ND> 1. | ND> 1. | ND> 1. | ND> 1. | 12.6 | 6,780. | 21.9 | **11,200.** | **720.** | isopropylbenzene=1.2 | 165.9 | 18,721.9 |
| P-3 | 5237-010821-321 | 21-Aug-01 | 28.5-32.5 | **104.** | 29.9 | ND> 10. | 22.3 | **933.** | ND> 10. | ND> 10. | ND> 10. | ND> 10. | ND> 10. | ND> 10. | ND> 10. | ND> 10. | ND> 12. | 1,2,4-TMB = 23.6 | 1,089.2 | ND |
| | 5237-010821-323 | 21-Aug-01 | 55-59 | 23.6 | ND> 10. | ND> 10. | ND> 10. | 53.7 | ND> 10. | ND> 10. | ND> 10. | ND> 10. | ND> 10. | 312. | ND> 10. | ND> 10. | 212. | ND | 77.3 | 524. |
| | 5237-010821-325 | 21-Aug-01 | 96-100 | 21.5 | ND> 1. | ND> 1. | ND> 1. | 5.82 | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | 5.99 | ND> 1. | ND> 1. | 21.2 | ND | 27.3 | 27.2 |
| P-4 | 5237-010815-309 | 15-Aug-01 | 28-32 | 12. | ND> 1. | ND> 1. | ND> 2. | 2.99 | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | 15. | ND |
| | 5237-010815-310 | 15-Aug-01 | 50-54 | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | 453. | 4.32 | 33.3 | 29.6 | ND | ND | 520.2 |
| P-5 | 5237-010815-311 | 15-Aug-01 | 29-33 | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| (duplicate) | 5237-010815-312 | 15-Aug-01 | 29-33 | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| | 5237-010815-313 | 15-Aug-01 | 52-56 | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | 1.33 | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | 1.3 |
| | 5237-010815-314 | 15-Aug-01 | 96-100 | ND> 1. | ND> 1. | ND> 1. | ND> 2. | 16.6 | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | 16.6 | ND |
| P-6 | 5237-010802-300 | 2-Aug-01 | 32-36 | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| | 5237-010802-301 | 2-Aug-01 | 46-50 | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| P-7 | 5237-010809-307 | 9-Aug-01 | 56-62 | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| P-8 | 5237-010809-304 | 9-Aug-01 | 28-32 | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| | 5237-010809-305 | 9-Aug-01 | 50-54 | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| | 5237-010809-306 | 9-Aug-01 | 80-84 | 11.1 | ND> 10. | ND> 10. | ND> 20. | ND> 20. | 199. | 425. | 15.1 | 155. | ND> 10. | ND> 10. | ND> 10. | ND> 10. | 21.1 | ND | 805.2 | 21.1 |
| P-9 | 5237-010816-320 | 16-Aug-01 | 31-35 | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| Stormwater Effluent Samples | | | | | | | | | | | | | | | | | | | | |
| Fab 1 Area Outfall | 5237-010822-327 | 22-Aug-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | acetone=34.4<br>chloroform = 2.69 | 34.4 | 2.69 |
| Fab 2 Area Outfall | 5237-010822-328 | 22-Aug-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| Admin Area Outfall | 5237-010822-329 | 22-Aug-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| Quality Control Samples | | | | | | | | | | | | | | | | | | | | |
| Trip Blank | 5237-010802-302 | 2-Aug-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| Trip Blank | 5237-010809-303 | 9-Aug-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| Trip Blank | 5237-010815-308 | 15-Aug-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| Trip Blank | 5237-010816-315 | 16-Aug-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| Trip Blank | 5237-010821-322 | 21-Aug-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| Trip Blank | 5237-010822-326 | 22-Aug-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| Water EB | 5237-010816-319 | 16-Aug-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| Soil EB | 5237-010821-324 | 21-Aug-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | 71. [3] | 29,000. [3] | 200,000. [3] | # | 620. [4] | 21,000. [3] | 17,000. [3] | 2,600. [3] | 2,600. [3] | # | 11,600. [4] | 140,000. [3] | 81. [3] | 525. [3] | # | # | # |

Note:
# = not established
AVOCs = aromatic volatile organic compounds
bgs = below ground surface
DCB = dichlorobenzene
DCE = dichloroethene
EB = equipment blank
EPA = U.S. Environmental Protection Agency
HVOCs = halogenated volatile organic compounds
ND = not detected above detection limit indicated
ppb = parts per billion
TCE = trichloroethene
TMB = trimethylbenzene
ug/l = micrograms/liter
VOCs = volatile organic compounds

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC
4 = Reference Level based on Lowest Observable Health Effect Level for Freshwater, as provided within NOAA Screening Quick Reference Tables, updated September 1999
**Bold** = Detected above lowest identified AWQC



SCOEPA00010269

**TABLE 2**
**Summary of Analytical Results for Groundwater Samples: Temporary Well Points**
**Polynuclear Aromatic Hydrocarbons by EPA Method 8270 SIM or 8270C**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| PAHs by EPA Method 8270 (SIM) | | | | Analytical Results ug/l (ppb) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Carcinogenic PAHs | | | | | | | Non-carcinogenic PAHs | | | | | | | | | | |
| Well Point Location | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Benzo (a) anthracene | Benzo (b) fluoranthene | Benzo (k) fluoranthene | Benzo (a) pyrene | Chrysene | Dibenzo (ah) anthracene | Indeno (1,2,3-cd) pyrene | Acenaphthene | Acenaphthylene | Anthracene | Benzo (ghi) perylene | Fluoranthene | Fluorene | Naphthalene | Phenanthrene | Pyrene | Total PAHs |
| P-2 | 5237-010816-316 | 16-Aug-01 | 28-32 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND |
| | 5237-010816-317 | 16-Aug-01 | 54-58 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | 52.1 | ND> 2. | 2.9 | ND> 2. | 4.7 | 16.4 | ND> 2. | 12. | 5.2 | 93.3 |
| | 5237-010816-318 | 16-Aug-01 | 96-100 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | 8.1 | ND> 2. | 2.8 | ND> 2. | 5.7 | 3.6 | 5.8 | 20. | 5.6 | 51.6 |
| P-3 | 5237-010821-321 | 21-Aug-01 | 28.5-32.5 | **4.2** | **2.12** | ND> 2. | **4.23** | **5.34** | ND> 2. | ND> 2. | 62. | ND> 2. | 19.1 | 2.51 | 26.8 | 43. | 214. | 88.3 | 28. | 499.6 |
| | 5237-010821-323 | 21-Aug-01 | 55-59 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | 3.41 | ND> 2. | ND> 2. | ND> 2. | 2.48 | ND> 2. | 4.72 | 8.69 | 2.45 | 21.8 |
| | 5237-010821-325 | 21-Aug-01 | 96-100 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | 7.56 | ND> 2. | 2.94 | ND> 2. | 5.55 | 3.95 | 12. | 22.8 | 5.41 | 60.2 |
| P-4 | 5237-010815-309 | 15-Aug-01 | 28-32 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | 40.4 | ND> 2. | 4.18 | ND> 2. | 8.16 | 11.9 | 2.96 | 24.6 | 9.61 | 101.8 |
| | 5237-010815-310 | 15-Aug-01 | 50-54 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND |
| P-5 | 5237-010815-311 | 15-Aug-01 | 29-33 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | 6.62 | ND> 2. | ND> 2. | ND> 2. | 3.32 | 3.58 | ND> 2. | 8.16 | 3.29 | 25. |
| (duplicate) | 5237-010815-312 | 15-Aug-01 | 29-33 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | 5.76 | ND> 2. | ND> 2. | ND> 2. | 3.63 | 2.99 | ND> 2. | 7.56 | 3.99 | 23.9 |
| | 5237-010815-313 | 15-Aug-01 | 52-56 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND |
| | 5237-010815-314 | 15-Aug-01 | 96-100 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | 4.69 | ND> 2. | 2.14 | ND> 2. | 3.04 | 2.99 | 19.4 | 14.5 | 3.12 | 49.9 |
| P-6 | 5237-010802-300 | 2-Aug-01 | 32-36 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | 0.47 | ND> 0.1 | ND> 0.1 | ND> 0.1 | 0.29 | 0.18 | 0.91 | 0.65 | 0.27 | 2.8 |
| | 5237-010802-301 | 2-Aug-01 | 46-50 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | 0.15 | 0.16 | ND> 0.1 | 0.3 |
| P-7 | 5237-010809-307 | 9-Aug-01 | 56-62 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND |
| P-8 | 5237-010809-304 | 9-Aug-01 | 28-32 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | 9.4 | ND> 2. | ND> 2. | ND> 2. | 2.8 | 3.1 | ND> 2. | 8.5 | 3.3 | 27.1 |
| | 5237-010809-305 | 9-Aug-01 | 50-54 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND |
| | 5237-010809-306 | 9-Aug-01 | 80-84 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | 2.1 | ND> 2. | 2.1 |
| P-9 | 5237-010816-320 | 16-Aug-01 | 31-35 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND |
| Stormwater Effluent Samples | | | | | | | | | | | | | | | | | | | | |
| Fab 1 Area Outfall | 5237-010822-327 | 22-Aug-01 | NA | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND |
| Fab 2 Area Outfall | 5237-010822-328 | 22-Aug-01 | NA | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND |
| Admin Area Outfall | 5237-010822-329 | 22-Aug-01 | NA | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND |
| Quality Control Samples | | | | | | | | | | | | | | | | | | | | |
| Trip Blank | 5237-010821-322 | 21-Aug-01 | NA | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND |
| Water EB | 5237-010816-319 | 16-Aug-01 | NA | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND |
| Soil EB | 5237-010821-324 | 21-Aug-01 | NA | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | 0.049 [3] | 0.049 [3] | 0.049 [3] | 0.049 [3] | 0.049 [3] | 0.049 [3] | 0.049 [3] | 2,700. [2] | # | 110,000. [3] | # | 370. [3] | 14,000. [3] | 620. [4] | # | 11,000. [3] | # |

Note:
# = not established
bgs = below ground surface
EB = equipment blank
EPA = U.S. Environmental Protection Agency
ND = not detected above detection limit indicated
PAHs = polynuclear aromatic hydrocarbons
ppb = parts per billion
ug/l = micrograms per liter

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC
4 = Reference Level based on Lowest Observable Health Effect Level for Freshwater, as provided within NOAA Screening Quick Reference Tables, updated September 1999
**Bold** = Detected above lowest identified AWQC

Updated: 11/20/01 RBE
File Name: 01-04 GW Rslts_probes



SCOEPA00010270

**TABLE 3**
**Summary of Analytical Results for Groundwater Samples: Temporary Well Points**
**Detected Semi-Volatile Organic Compounds by EPA Method 8270C**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| SVOCs by EPA Method 8270 | | | | Analytical Results ug/l (ppb) | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Point Location | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Bis 2-ethyl hexyl phthalate | | Butyl benzyl phthalate | | Carbazole | | Dibenzofuran | | 1,2-Dichlorobenzene | | 1,4-dichlorobenzene | | Diethyl phthalate | | Bis (2-chloroisopropyl)ether | | 2-Methylnaphthalene | | PAHs |
| P-2 | 5237-010816-316 | 16-Aug-01 | 28-32 | ND> | 2. | 2. | | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | 8.4 | B | ND> | 2. | See Table 2 |
| | 5237-010816-317 | 16-Aug-01 | 54-58 | ND> | 2. | 2.4 | | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | 10. | B | ND> | 2. | See Table 2 |
| | 5237-010816-318 | 16-Aug-01 | 96-100 | ND> | 2. | 3.4 | | ND> | 4. | | | ND> | 2. | ND> | 2. | ND> | 2. | 11.1 | B | 5.8 | | See Table 2 |
| P-3 | 5237-010821-321 | 21-Aug-01 | 28.5-32.5 | ND> | 2. | ND> | 2. | 56.5 | | 6.29 | | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | 82.8 | | See Table 2 |
| | 5237-010821-323 | 21-Aug-01 | 55-59 | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | See Table 2 |
| | 5237-010821-325 | 21-Aug-01 | 96-100 | 5.57 | | 3.64 | | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | 3.21 | | See Table 2 |
| P-4 | 5237-010815-309 | 15-Aug-01 | 28-32 | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | 17. | B | ND> | 2. | See Table 2 |
| | 5237-010815-310 | 15-Aug-01 | 50-54 | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | 15.9 | B | ND> | 2. | See Table 2 |
| P-5 | 5237-010815-311 | 15-Aug-01 | 29-33 | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | 11.1 | B | ND> | 2. | See Table 2 |
| (duplicate) | 5237-010815-312 | 15-Aug-01 | 29-33 | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | 11.5 | B | ND> | 2. | See Table 2 |
| | 5237-010815-313 | 15-Aug-01 | 52-56 | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | 11. | B | ND> | 2. | See Table 2 |
| | 5237-010815-314 | 15-Aug-01 | 96-100 | ND> | 2. | 3.52 | | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | 12.1 | B | 4.55 | | See Table 2 |
| P-7 | 5237-010809-307 | 9-Aug-01 | 56-62 | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | 3.9 | | ND> | 2. | ND> | | See Table 2 |
| P-8 | 5237-010809-304 | 9-Aug-01 | 28-32 | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | See Table 2 |
| | 5237-010809-305 | 9-Aug-01 | 50-54 | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | See Table 2 |
| | 5237-010809-306 | 9-Aug-01 | 80-84 | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | 31.1 | | 9.3 | | 5.1 | | ND> | 2. | ND> | 2. | See Table 2 |
| P-9 | 5237-010816-320 | 16-Aug-01 | 31-35 | ND> | 2. | 22.2 | | | 4. | ND> | 2. | ND> | 2. | ND> | 2. | 7.1 | | 10.8 | B | ND> | 2. | See Table 2 |
| Stormwater Effluent Samples | | | | | | | | | | | | | | | | | | | | | | |
| Fab 1 Area Outfall | 5237-010822-327 | 22-Aug-01 | NA | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | See Table 2 |
| Fab 2 Area Outfall | 5237-010822-328 | 22-Aug-01 | NA | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | See Table 2 |
| Admin Area Outfall | 5237-010822-329 | 22-Aug-01 | NA | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | See Table 2 |
| Quality Control Samples | | | | | | | | | | | | | | | | | | | | | | |
| Trip Blank | 5237-010821-322 | 21-Aug-01 | NA | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | See Table 2 |
| Water EB | 5237-010816-319 | 16-Aug-01 | NA | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | 8.1 | B | ND> | 2. | See Table 2 |
| Soil EB | 5237-010821-324 | 21-Aug-01 | NA | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | See Table 2 |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | 5.9 | [3] | 5,200. | [3] | # | | # | | 17,000. | [3] | 2,600. | [3] | 120,000. | [3] | 170,000. | [3] | # | | # |

Note:
bgs = below ground surface
EB = equipment blank
EPA = U.S. Environmental Protection Agency
ND = Not detected above detection limit indicated
PAHs = polynuclear aromatic hydrocarbons
ppb = parts per billion
ug/l = micrograms/liter

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC
B = Analyte detected in the associated Method Blank

**TABLE 4**
**Summary of Analytical Results for Groundwater Samples: Temporary Well Points**
**Metals, Cyanide, and Chloride**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

| Well Point Location | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Analytical Results – mg/l (ppm) Dissolved Metals by EPA Methods 6010, 200.7 and/or 7000 Series | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Antimony | | Arsenic | | Barium | Cadmium | | Chromium | | Cobalt | | Copper | | Iron | Lead | |
| P-2 | 5237-010816-316 | 16-Aug-01 | 28-32 | ND> | 0.003 | **0.024** | | 0.121 | ND> | 0.001 | 0.005 | | 0.001 | | 0.002 | | 99.5 | ND> | 0.005 |
| | 5237-010816-317 | 16-Aug-01 | 54-58 | ND> | 0.003 | ND> | 0.005 | 0.05 | ND> | 0.001 | ND> | 0.002 | 0.003 | | ND> | 0.005 | 26.5 | ND> | 0.005 |
| | 5237-010816-318 | 16-Aug-01 | 96-100 | ND> | 0.003 | ND> | 0.005 | 0.151 | ND> | 0.001 | **0.022** | | 0.011 | | **0.013** | | 71.5 | ND> | 0.005 |
| P-3 | 5237-010821-321 | 21-Aug-01 | 28.5-32.5 | ND> | 0.003 | **0.016** | | 0.172 | ND> | 0.001 | ND> | 0.001 | ND> | 0.001 | 0.001 | | 100. | ND> | 0.005 |
| | 5237-010821-323 | 21-Aug-01 | 55-59 | ND> | 0.003 | ND> | 0.005 | 0.126 | ND> | 0.001 | 0.003 | | 0.007 | | 0.002 | | 40.4 | ND> | 0.005 |
| | 5237-010821-325 | 21-Aug-01 | 96-100 | ND> | 0.003 | ND> | 0.005 | 0.101 | ND> | 0.001 | 0.002 | | 0.005 | | 0.002 | | 46.5 | ND> | 0.005 |
| P-4 | 5237-010815-309 | 15-Aug-01 | 28-32 | ND> | 0.003 | **0.008** | | 0.149 | ND> | 0.001 | ND> | 0.002 | 0.002 | | ND> | 0.005 | 87.5 | ND> | 0.005 |
| | 5237-010815-310 | 15-Aug-01 | 50-54 | ND> | 0.003 | ND> | 0.005 | 0.105 | ND> | 0.001 | ND> | 0.002 | 0.003 | | ND> | 0.005 | 47.3 | ND> | 0.005 |
| P-5 | 5237-010815-311 | 15-Aug-01 | 29-33 | 0.003 | | **0.008** | | 0.202 | ND> | 0.001 | ND> | 0.002 | 0.016 | | ND> | 0.005 | 86. | ND> | 0.005 |
| (duplicate) | 5237-010815-312 | 15-Aug-01 | 29-33 | 0.005 | | **0.009** | | 0.245 | ND> | 0.001 | 0.009 | | 0.011 | | **0.01** | | 100. | **0.019** | |
| | 5237-010815-313 | 15-Aug-01 | 52-56 | 0.004 | | **0.011** | | 0.352 | ND> | 0.001 | **0.129** | | 0.046 | | **0.089** | | 92.7 | **0.008** | |
| | 5237-010815-314 | 15-Aug-01 | 96-100 | 0.022 | | **0.034** | | 1.08 | ND> | 0.001 | **0.61** | | 0.134 | | **0.327** | | 457. | **0.036** | |
| P-6 | 5237-010802-300 | 2-Aug-01 | 32-36 | ND> | 0.003 | ND> | 0.005 | 0.056 | ND> | 0.001 | ND> | 0.0015 | 0.012 | | 0.002 | | 3.29 | ND> | 0.005 |
| | 5237-010802-301 | 2-Aug-01 | 46-50 | ND> | 0.003 | ND> | 0.005 | 0.101 | ND> | 0.001 | ND> | 0.002 | 0.005 | | 0.002 | | 19.5 | ND> | 0.005 |
| P-7 | 5237-010809-307 | 9-Aug-01 | 56-62 | ND> | 0.005 | ND> | 0.005 | 0.229 | ND> | 0.002 | ND> | 0.005 | 0.006 | | ND> | 0.005 | 45.2 | ND> | 0.005 |
| P-8 | 5237-010809-304 | 9-Aug-01 | 28-32 | ND> | 0.005 | **0.019** | | 0.138 | ND> | 0.002 | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | 35.2 | ND> | 0.005 |
| | 5237-010809-305 | 9-Aug-01 | 50-54 | ND> | 0.005 | ND> | 0.005 | 0.108 | ND> | 0.002 | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | 6.17 | ND> | 0.005 |
| | 5237-010809-306 | 9-Aug-01 | 80-84 | ND> | 0.005 | ND> | 0.005 | 0.312 | ND> | 0.002 | ND> | 0.005 | 0.01 | | 0.005 | | 43.5 | ND> | 0.005 |
| P-9 | 5237-010816-320 | 16-Aug-01 | 31-35 | ND> | 0.003 | **0.03** | | 0.088 | ND> | 0.001 | ND> | 0.002 | 0.008 | | ND> | 0.005 | 13.4 | ND> | 0.005 |
| Stormwater Effluent Samples | | | | | | | | | | | | | | | | | | | |
| Fab 1 Area Outfall | 5237-010822-327 | 22-Aug-01 | NA | ND> | 0.003 | ND> | 0.005 | 0.0056 | ND> | 0.001 | ND> | 0.0015 | ND> | 0.001 | **0.0134** | | 0.0735 | ND> | 0.005 |
| Fab 2 Area Outfall | 5237-010822-328 | 22-Aug-01 | NA | ND> | 0.003 | ND> | 0.005 | 0.0089 | ND> | 0.001 | ND> | 0.0015 | ND> | 0.001 | **0.0155** | | 0.458 | ND> | 0.005 |
| Admin Area Outfall | 5237-010822-329 | 22-Aug-01 | NA | ND> | 0.003 | ND> | 0.005 | 0.0048 | ND> | 0.001 | ND> | 0.0015 | ND> | 0.001 | **0.0098** | | 0.0098 | **0.0292** | |
| Quality Control Samples | | | | | | | | | | | | | | | | | | | |
| Trip Blank | 5237-010821-322 | 21-Aug-01 | NA | ND> | 0.003 | ND> | 0.005 | ND> 0.002 | ND> | 0.001 | ND> | 0.002 | ND> | 0.001 | 0.001 | | 0.033 | ND> | 0.005 |
| Water EB | 5237-010816-319 | 16-Aug-01 | NA | ND> | 0.005 | ND> | 0.005 | ND> 0.002 | ND> | 0.002 | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | 0.086 | ND> | 0.005 |
| Soil EB | 5237-010821-324 | 21-Aug-01 | NA | ND> | 0.003 | ND> | 0.005 | ND> 0.002 | ND> | 0.002 | ND> | 0.002 | ND> | 0.001 | ND> | 0.001 | 0.02 | ND> | 0.005 |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | 4.3 [3] | | 0.00014 [3] | | # | 0.002 [2] | | 0.011 [2] | | # | | 0.009 [2] | | # | 0.003 [2] | |

Note:
# = not established
bgs = below ground surface
EB = equipment blank
EPA = U.S. Environmental Protection Agency
mg/l = milligrams/liter
ND = not detected above detection limit indicated
ppm = parts per million

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC

**Bold** = Detected above lowest identified AWQC

**TABLE 4**
**Summary of Preliminary Analytical Results for Groundwater Samples: Temporary Well Points**
**Metals, Cyanide, and Chloride**

Source Control Evaluation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Well Point Location | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Analytical Results – mg/l (ppm) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Dissolved Metals by EPA Methods 6010, 200.7 and/or 7000 Series | | | | | | | | EPA Method 9010 | EPA Method 300 |
| | | | | Magnesium | Manganese | Nickel | Selenium | Silver | Titanium | Vanadium | Zinc | Cyanide | Chloride |
| P-2 | 5237-010816-316 | 16-Aug-01 | 28-32 | 11.7 | 3.63 | 0.019 | ND> 0.005 | ND> 0.002 | 0.078 | 0.005 | 0.072 | **0.723** | 2.25 |
| | 5237-010816-317 | 16-Aug-01 | 54-58 | 32.1 | 0.331 | 0.011 | ND> 0.005 | ND> 0.002 | 0.004 | 0.001 | 0.02 | **0.255** | 26. |
| | 5237-010816-318 | 16-Aug-01 | 96-100 | 37.7 | 4.47 | 0.039 | ND> 0.005 | ND> 0.002 | 0.797 | 0.037 | **0.151** | **0.549** | 24. |
| P-3 | 5237-010821-321 | 21-Aug-01 | 28.5-32.5 | 24.6 | 5.06 | 0.007 | ND> 0.005 | ND> 0.002 | 0.046 | 0.005 | 0.017 | **0.65** | 7. |
| | 5237-010821-323 | 21-Aug-01 | 55-59 | 59.6 | 0.771 | 0.03 | ND> 0.005 | ND> 0.002 | 0.107 | 0.005 | 0.078 | **0.45** | 2. |
| | 5237-010821-325 | 21-Aug-01 | 96-100 | 41.7 | 2.06 | 0.039 | ND> 0.005 | ND> 0.002 | 0.059 | 0.003 | **0.173** | **0.498** | 9.5 |
| P-4 | 5237-010815-309 | 15-Aug-01 | 28-32 | 23.1 | 6.35 | 0.006 | ND> 0.005 | ND> 0.002 | 0.026 | 0.002 | 0.024 | **0.056** | ND> 0.5 |
| | 5237-010815-310 | 15-Aug-01 | 50-54 | 55.5 | 1.28 | 0.037 | ND> 0.005 | ND> 0.002 | 0.01 | 0.001 | 0.09 | **0.071** | ND> 0.5 |
| P-5 | 5237-010815-311 | 15-Aug-01 | 29-33 | 74.9 | 6.11 | 0.047 | ND> 0.005 | ND> 0.002 | 0.012 | 0.002 | 0.008 | **0.35** | 1. |
| (duplicate) | 5237-010815-312 | 15-Aug-01 | 29-33 | 76.8 | 5.52 | 0.019 | ND> 0.005 | ND> 0.002 | 0.158 | 0.009 | 0.083 | **0.122** | 1.75 |
| | 5237-010815-313 | 15-Aug-01 | 52-56 | 82.5 | 1.57 | **0.102** | ND> 0.005 | ND> 0.002 | 3.88 | 0.204 | **0.333** | **0.139** | 0.5 |
| | 5237-010815-314 | 15-Aug-01 | 96-100 | 132. | 9.98 | **0.351** | ND> 0.005 | ND> 0.002 | 11.7 | 0.635 | **1.69** | **0.66** | 33. |
| P-6 | 5237-010802-300 | 2-Aug-01 | 32-36 | 65.4 | 1.92 | 0.012 | ND> 0.005 | ND> 0.002 | 0.01 | 0.003 | 0.025 | ND> 0.02 | 0.75 |
| | 5237-010802-301 | 2-Aug-01 | 46-50 | 51.4 | 0.715 | 0.031 | 0.005 | ND> 0.002 | 0.016 | ND> 0.001 | **0.23** | **0.037** | 1.75 |
| P-7 | 5237-010809-307 | 9-Aug-01 | 56-62 | 30.1 | 6.44 | 0.03 | **0.006** | ND> 0.005 | 0.04 | ND> 0.005 | 0.092 | ND>0.02 | 40.8 |
| P-8 | 5237-010809-304 | 9-Aug-01 | 28-32 | 39.4 | 6.54 | 0.006 | **0.006** | ND> 0.005 | 0.026 | ND> 0.005 | 0.016 | **0.12** | 0.75 |
| | 5237-010809-305 | 9-Aug-01 | 50-54 | 70.3 | 0.542 | 0.022 | ND> 0.005 | ND> 0.005 | 0.012 | 0.009 | **0.136** | **0.18** | ND> 0.5 |
| | 5237-010809-306 | 9-Aug-01 | 80-84 | 152. | 28.9 | **0.061** | **0.016** | ND> 0.005 | 0.101 | ND> 0.005 | **0.307** | ND> 0.02 | 1,000. |
| P-9 | 5237-010816-320 | 16-Aug-01 | 31-35 | 18.9 | 14.5 | 0.005 | **0.006** | ND> 0.002 | 0.012 | 0.001 | 0.014 | **0.034** | 1. |
| Stormwater Effluent Samples | | | | | | | | | | | | | |
| Fab 1 Area Outfall | 5237-010822-327 | 22-Aug-01 | NA | 0.834 | 0.0273 | ND> 0.003 | ND> 0.005 | ND> 0.0019 | 0.0027 | 0.002 | **0.167** | ND> 0.02 | - |
| Fab 2 Area Outfall | 5237-010822-328 | 22-Aug-01 | NA | 0.29 | 0.0235 | ND> 0.003 | ND> 0.005 | ND> 0.0019 | 0.0011 | 0.0033 | **0.475** | ND> 0.02 | - |
| Admin Area Outfall | 5237-010822-329 | 22-Aug-01 | NA | 0.239 | 0.0124 | ND> 0.003 | ND> 0.005 | ND> 0.0019 | 0.001 | 0.0015 | **0.28** | ND> 0.02 | - |
| Quality Control Samples | | | | | | | | | | | | | |
| Trip Blank | 5237-010821-322 | 21-Aug-01 | NA | ND> 0.025 | ND> 0.025 | ND> 0.003 | ND> 0.005 | ND> 0.002 | ND> 0.001 | ND> 0.001 | 0.009 | **0.022** | - |
| Water EB | 5237-010816-319 | 16-Aug-01 | NA | ND> 0.05 | ND> 0.005 | ND> 0.003 | ND> 0.005 | ND> 0.005 | 0.002 | ND> 0.001 | 0.003 | ND> 0.02 | 23.8 |
| Soil EB | 5237-010821-324 | 21-Aug-01 | NA | ND> 0.025 | ND> 0.005 | ND> 0.003 | ND> 0.005 | ND> 0.002 | ND> 0.001 | ND> 0.001 | ND> 0.006 | ND> 0.02 | ND> 0.5 |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | # | # | 0.052 [2] | 0.005 [2] | 0.003 [2] | # | # | 0.12 [2] | 0.005 [2] | # |

Note: # = not established
bgs = below ground surface
EB = equipment blank
EPA = U.S. Environmental Protection Agency
mg/l = milligrams/liter
ND = not detected above detection limit indicated
ppm = parts per million

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC

**Bold** = Detected above lowest identified AWQC

**TABLE 5**
**Summary of Analytical Results for Groundwater Samples: Monitoring Wells**
**Detected Volatile Organic Compounds by EPA Method 8260**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Well Number | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Analytical Results – ug/l (ppb) VOCs by EPA Method 8260 | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Aromatic VOCs (AVOCs) | | | | | | | | | | Halogenated VOCs (HVOCs) | | | | | | | | |
| | | | | Benzene | Ethylbenzene | Toluene | Xylene | Naphthalene | Chlorobenzene | 1,2-DCB | 1,3-DCB | 1,4-DCB | 1,1-DCE | cis-1,2-DCE | trans-1,2-DCE | TCE | Vinyl Chloride | Other VOCs | Total AVOCs | Total HVOCs |
| WS-8-33 | 5237-011009-107 | 9-Oct-01 | 23-33 | **107.** | 27.9 | ND> 10. | ND> 20. | **841.** | ND> 10. | ND> 10. | ND> 10. | ND> 10. | ND> 10. | ND> 10. | ND> 10. | ND> 10. | ND> 12. | 1,2,4-TMB = 18.8 | 994.7 | ND |
| WS-8-59 | 5237-011008-104 | 8-Oct-01 | 49-59 | 14.7 | ND> 1. | ND> 1. | ND> 2. | 38.9 | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | 251. | ND> 1. | ND> 1. | 92.4 | ND | 53.6 | 343.4 |
| (duplicate) | 5237-011008-105 | | | 21.4 | ND> 1. | 2.02 | ND> 2. | 49.9 | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | 345. | ND> 1. | ND> 1. | 129. | ND | 73.3 | 474. |
| WS-9-34 | 5237-011008-102 | 8-Oct-01 | 24-34 | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 5. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| Quality Control Samples | | | | | | | | | | | | | | | | | | | | |
| Trip Blank | 5237-011008-101 | 8-Oct-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 5. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| Water EB | 5237-011008-103 | 8-Oct-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 5. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | acetone = 149 | 149. | ND |
| Trip Blank | 5237-011009-106 | 9-Oct-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | 71. [2] | 29,000. [3] | 200,000. [3] | # | 620. [4] | 21,000. [3] | 17,000. [3] | 2,600. [3] | 2,600. [3] | # | 11,600. [4] | 140,000. [3] | 81. [2] | 525. [3] | # | # | # |

Note:
# = not established
AVOCs = aromatic volatile organic compounds
bgs = below ground surface
DCB = dichlorobenzene
DCE = dichloroethene
EB = equipment blank
EPA = U.S. Environmental Protection Agency
HVOCs = halogenated volatile organic compounds
ND = not detected above detection limit indicated
ppb = parts per billion
TCE = trichloroethene
TMB = trimethylbenzene
ug/l = micrograms/liter
VOCs = volatile organic compounds

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC
4 = Reference Level based on Lowest Observable Health Effect Level for Freshwater, as provided within NOAA Screening Quick Reference Tables, updated September 1999
**Bold** = Detected above lowest identified AWQC



SCOEPA00010274

**TABLE 6**
**Summary of Analytical Results for Groundwater Samples: Monitoring Wells**
**Polynuclear Aromatic Hydrocarbons by EPA Method 8270 SIM**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| PAHs by EPA Method 8270 (SIM) | | | | Analytical Results ug/l (ppb) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Carcinogenic PAHs | | | | | | | Non-carcinogenic PAHs | | | | | | | | | |
| Well Number | HAT Sample Number | Sample Date | Screen Interval (feet bgs) | Benzo (a) anthracene | Benzo (b) fluoranthene | Benzo (k) fluoranthene | Benzo (a) pyrene | Chrysene | Dibenzo (ah) anthracene | Indeno (1,2,3-cd) pyrene | Acenaphthene | Acenaphthylene | Anthracene | Benzo (ghi) perylene | Fluoranthene | Fluorene | Naphthalene | Phenanthrene | Pyrene | Total PAHs |
| WS-8-33 | 5237-011009-107 | 9-Oct-01 | 23-33 | **0.55** | **0.19** | ND> 0.1 | **0.27** | **0.6** | ND> 0.1 | 0.11 | 98.7 | 1.17 | 8.42 | 0.15 | 7.83 | 32.5 | 485. | 85. | 7.65 | 728.1 |
| WS-8-59 | 5237-011008-104 | 8-Oct-01 | 49-59 | **0.25** | ND> 0.1 | ND> 0.1 | ND> 0.1 | **0.29** | ND> 0.1 | ND> 0.1 | 18.5 | 0.38 | 4.2 | ND> 0.1 | 5.8 | 7.9 | 22.7 | 31.8 | 6.4 | 98.2 |
| (duplicate) | 5237-011008-105 | | | **0.2** | ND> 0.1 | ND> 0.1 | ND> 0.1 | **0.24** | ND> 0.1 | ND> 0.1 | 18.9 | 0.39 | 4.1 | ND> 0.1 | 5.5 | 7.9 | 22.5 | 29.8 | 6.3 | 95.8 |
| WS-9-34 | 5237-011008-102 | 8-Oct-01 | 24-34 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | 2.07 | 0.15 | ND> 0.1 | ND> 0.1 | 0.36 | 0.18 | 0.45 | ND> 0.1 | 0.38 | 3.6 |
| Quality Control Samples | | | | | | | | | | | | | | | | | | | | |
| Trip Blank | 5237-011008-101 | 8-Oct-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND |
| Water EB | 5237-011008-103 | 8-Oct-01 | NA | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND |
| Trip Blank | 5237-011009-106 | 9-Oct-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | 0.049 [3] | 0.049 [3] | 0.049 [3] | 0.049 [3] | 0.049 [3] | 0.049 [3] | 0.049 [3] | 2,700. [2] | # | 110,000. [3] | # | 370. [3] | 14,000. [3] | 620. [4] | # | 11,000. [3] | # |

Note:
# = not established
bgs = below ground surface
EB = equipment blank
EPA = U.S. Environmental Protection Agency
ND = not detected above detection limit indicated
PAHs = polynuclear aromatic hydrocarbons
ppb = parts per billion
ug/l = micrograms per liter

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC
4 = Reference Level based on Lowest Observable Health Effect Level for Freshwater, as provided within NOAA Screening Quick Reference Tables, updated September 1999
**Bold** = Detected above lowest identified AWQC

# TABLE 7
## Summary of Analytical Results for Groundwater Samples: Monitoring Wells
## Detected Semi-Volatile Organic Compounds by EPA Method 8270C

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| SVOCs by EPA Method 8270 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Well Number | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Carbazole | Dibenzofuran | 2-Methylnaphthalene | PAHs |
| WS-8-33 | 5237-011009-107 | 9-Oct-01 | 23-33 | 14.7 | 4.26 | 59.2 | See Table 2 |
| WS-8-59 | 5237-011008-104 | 8-Oct-01 | 49-59 | ND> 4. | ND> 2. | 6.74 | See Table 2 |
| (duplicate) | 5237-011008-105 | | | ND> 4. | ND> 2. | 7.17 | See Table 2 |
| WS-9-34 | 5237-011008-102 | 8-Oct-01 | 24-34 | ND> 4. | ND> 2. | ND> 2. | See Table 2 |
| Quality Control Samples | | | | | | | |
| Trip Blank | 5237-011008-101 | 8-Oct-01 | NA | - | - | - | See Table 2 |
| Water EB | 5237-011008-103 | 8-Oct-01 | NA | ND> 4. | ND> 2. | ND> 2. | See Table 2 |
| Trip Blank | 5237-011009-106 | 9-Oct-01 | NA | - | - | - | See Table 2 |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | # | # | # | # |

Note:

bgs = below ground surface
EB = equipment blank
EPA = U.S. Environmental Protection Agency
ND = Not detected above detection limit indicated

PAHs = polynuclear aromatic hydrocarbons
ppb = parts per billion
ug/l = micrograms/liter
# = not established

1 = Ambient Water Quality Criteria (EPA 822-Z-99-001)



SCOEPA00010276

**TABLE 8**
**Summary of Analytical Results for Groundwater Samples: Monitoring Wells**
**Metals and Cyanide**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

| Well Number | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Analytical Results – mg/l (ppm) Total Metals by EPA Methods 6010, 200.7 and/or 7000 Series | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Antimony | Arsenic | Barium | Cadmium | Chromium | Cobalt | Copper | Iron | Lead |
| WS-8-33 | 5237-011009-107 | 9-Oct-01 | 23-33 | ND> 0.003 | **0.0063** | 0.184 | ND> 0.001 | 0.0069 | 0.0041 | **0.0264** | 117. | **0.0082** |
| WS-8-59 | 5237-011008-104 | 8-Oct-01 | 49-59 | ND> 0.003 | ND> 0.005 | 0.153 | ND> 0.001 | ND> 0.005 | ND> 0.001 | 0.0055 | 49.6 | ND> 0.005 |
| (duplicate) | 5237-011008-105 | | | ND> 0.003 | ND> 0.005 | 0.142 | ND> 0.001 | ND> 0.005 | ND> 0.001 | 0.0037 | 47. | ND> 0.005 |
| WS-9-34 | 5237-011008-102 | 8-Oct-01 | 24-34 | ND> 0.003 | ND> 0.005 | 0.246 | ND> 0.001 | ND> 0.005 | 0.0281 | 0.0074 | 33.9 | ND> 0.005 |
| Quality Control Samples | | | | | | | | | | | | |
| Trip Blank | 5237-011008-101 | 8-Oct-01 | NA | - | - | - | - | - | - | - | - | - |
| Water EB | 5237-011008-103 | 8-Oct-01 | NA | ND> 0.003 | ND> 0.005 | ND> 0.005 | ND> 0.001 | ND> 0.005 | ND> 0.001 | ND> 0.001 | 0.0417 | ND> 0.005 |
| Trip Blank | 5237-011009-106 | 9-Oct-01 | NA | - | - | - | - | - | - | - | - | - |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | 4.3 [3] | 0.00014 [3] | # | 0.002 [2] | 0.011 [2] | # | 0.009 [2] | # | 0.003 [2] |

Note: # = not established
bgs = below ground surface
EB = equipment blank
EPA = U.S. Environmental Protection Agency
mg/l = milligrams/liter
ND = not detected above detection limit indicated
ppm = parts per million

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC

**Bold** = Detected above lowest identified AWQC

**TABLE 8**
**Summary of Preliminary Analytical Results for Groundwater Samples: Monitoring Wells**
**Metals and Cyanide**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Well Number | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Analytical Results – mg/l (ppm) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Total Metals by EPA Methods 6010, 200.7 and/or 7000 Series | | | | | | | | EPA Method 335.2 | SM 4500 |
| | | | | Magnesium | Manganese | Nickel | Selenium | Silver | Titanium | Vanadium | Zinc | Total Cyanide | Amenable Cyanide |
| WS-8-33 | 5237-011009-107 | 9-Oct-01 | 23-33 | 27.2 | 5.07 | 0.0039 | ND> 0.005 | ND> 0.0019 | 0.766 | 0.0397 | 0.0496 | ND> 0.02 | ND> 0.02 |
| WS-8-59 | 5237-011008-104 | 8-Oct-01 | 49-59 | ND> 0.05 | 2.85 | ND> 0.003 | ND> 0.005 | ND> 0.0019 | 0.564 | 0.0233 | 0.0307 | **0.468** | ND> 0.02 |
| (duplicate) | 5237-011008-105 | | | ND> 0.05 | 2.84 | ND> 0.003 | ND> 0.005 | ND> 0.0019 | 0.448 | 0.0173 | 0.0236 | **0.456** | ND> 0.02 |
| WS-9-34 | 5237-011008-102 | 8-Oct-01 | 24-34 | 53.3 | 4.31 | ND> 0.003 | ND> 0.005 | ND> 0.0019 | 0.0055 | ND> 0.001 | 0.0055 | **0.14** | ND> 0.02 |
| Quality Control Samples | | | | | | | | | | | | | |
| Trip Blank | 5237-011008-101 | 8-Oct-01 | NA | - | - | - | - | - | - | - | - | - | - |
| Water EB | 5237-011008-103 | 8-Oct-01 | NA | 0.0775 | ND> 0.005 | ND> 0.003 | ND> 0.005 | ND> 0.0019 | ND> 0.001 | ND> 0.005 | ND> 0.005 | ND> 0.02 | - |
| Trip Blank | 5237-011009-106 | 9-Oct-01 | NA | - | - | - | - | - | - | - | - | - | - |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | # | # | 0.052 [2] | 0.005 [2] | 0.003 [2] | # | # | 0.12 [2] | 0.005 [2] | |

Note: # = not established
bgs = below ground surface
EB = equipment blank
EPA = U.S. Environmental Protection Agency
mg/l = milligrams/liter
ND = not detected above detection limit indicated
ppm = parts per million

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC

**Bold** = Detected above lowest identified AWQC

**TABLE 9**
**Summary Of Analytical Results for Soil Samples**
**TPH, BTEX, Total PAHs, TOC, and Cyanide**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Soil Sample Location | Sample Number | Sample Date | Depth (feet bgs) | Analytical Results mg/kg (ppm) | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Field Observation | | | | | Northwest Method | | | | | EPA Method 8270 PAHs | | EPA Method 8260 Volatile Aromatics | | | | | | EPA Method 415.1 | EPA Method 336 |
| | | | | | | | | | HCID | | | TPH-Dx | | | | | | | | | | | |
| | | | | Odor | Sheen | Lamp Black | Oil | Tar | Gasoline | Diesel | Oil | Diesel | Oil | Carcinogenic PAHs | Total PAHs | Benzene | Toluene | Ethyl benzene | Xylenes | Total BTEX | TOC (%) | Total Cyanide |
| Push Probe Boring Samples | | | | | | | | | | | | | | | | | | | | | | | |
| P-1 | 5237-010817-139 | 17-Aug-01 | 17.0 | X | | | | | - | - | - | 47.8 | 149. | - | - | - | - | - | - | - | - | - | - |
| | 5237-010817-142 | 17-Aug-01 | 30.0 | X | X | | | X | ND>24,100 | Detect | ND>120,000 | **12,000.** | **13,300.** | 5,184. | 35,432. | 8.63 | 2.04 | 15.7 | 23.88 | 50.25 | - | 9,150. |
| | 5237-010817-144 | 17-Aug-01 | 39.0 | | | | | | - | - | - | ND> 27.8 | 101. | - | - | - | - | - | - | - | - | - | - |
| P-2 | 5237-010814-113 | 14-Aug-01 | 14.5 | | | | | | ND>22.7 | Detect | ND>114 | 77.3 | ND> 56.8 | - | - | - | - | - | - | - | - | - | - |
| | 5237-010814-115 | 14-Aug-01 | 22.5 | X | | | | | ND>23.3 | Detect | Detect | 365. | **805.** | 6.2 | 29.1 | ND> 0.01 | ND> 0.01 | ND> 0.01 | ND> 0. | ND | - | 11,500. |
| | 5237-010814-118 | 14-Aug-01 | 32.0 | X | X | | | | ND>24.7 | Detect | Detect | 414. | ND> 309. | - | - | - | - | - | - | - | - | - | - |
| P-3 | 5237-010820-152 | 20-Aug-01 | 6.5 | | | | | | - | - | - | ND>22 | 100. | - | - | - | - | - | - | - | - | - | ND> 0.02 |
| | 5237-010820-155 | 20-Aug-01 | 17.0 | X | X | | | | ND>2,150 | Detect | ND>10,800 | **1,120.** | **613.** | 1,115.4 | 7,308.1 | ND> 0.5 | ND> 0.5 | 3.36 | 6.68 | 10.04 | 4.13 | 13,900. |
| | 5237-010820-159 | 20-Aug-01 | 35.5 | | | | | | - | - | - | ND>29 | 106. | - | - | - | - | - | - | - | - | - | - |
| P-4 | 5237-010810-79 | 10-Aug-01 | 10.0 | | | | | | - | - | - | 37.4 | 210. | - | - | - | - | - | - | - | - | - | - |
| | 5237-010810-80 | 10-Aug-01 | 17.5 | X | X | | | | ND>217 | Detect | ND>1,090 | 178. | 135. | 85.8 | 431.3 | ND> 0.02 | ND> 0.02 | 0.2 | 0.4 | 0.4 | 0.89 | 6,430. |
| | 5237-010810-84 | 10-Aug-01 | 35.0 | | | | | | - | - | - | ND> 27.8 | ND> 69.4 | - | - | - | - | - | - | - | - | - | - |
| P-5 | 5237-010813-91 | 13-Aug-01 | 6.5 | | | | | | - | - | - | ND> 21.7 | ND> 54.3 | - | - | - | - | - | - | - | - | - | - |
| | 5237-010813-92 | 13-Aug-01 | 9.5 | X | X | | X | | ND>2,220 | Detect | ND>11,100 | **14,000.** | **6,000.** | 970.4 | 5,699.4 | ND> 0.1 | 0.15 | 1.38 | 3.67 | 5.2 | 5.51 | 8,780. |
| | 5237-010813-93 | 13-Aug-01 | 15.0 | | | | | | - | - | - | ND> 21.7 | ND> 54.3 | - | - | - | - | - | - | - | - | - | - |
| | 5237-010813-98 | 13-Aug-01 | 32.5 | | | | | | - | - | - | ND> 26. | ND> 64.9 | - | - | - | - | - | - | - | - | - | - |
| P-6 | 5237-010802-04 | 2-Aug-01 | 10.0 | X | | | | | ND>22.5 | ND>56.2 | Detect | 108. | 157. | 28.1 | 50. | - | - | - | - | - | 0.9 | 1,000. |
| | 5237-010802-07 | 2-Aug-01 | 23.0 | | | | | | - | - | - | ND> 24.1 | ND> 60.2 | - | - | - | - | - | - | - | - | - | - |
| P-7 | 5237-010808-64 | 8-Aug-01 | 22.5 | X | X | | X | | ND>30.3 | Detect | Detect | **5,950.** | **5,470.** | 1.9 | 16.4 | ND> 0.01 | ND> 0.01 | ND> 0.01 | ND> 0.01 | ND | 7.05 | ND> 0.02 |
| (duplicate) | 5237-010808-65 | 8-Aug-01 | 22.5 | X | X | | X | | - | - | - | **1,960.** | **1,770.** | ND | 3.4 | ND> 0.01 | ND> 0.01 | ND> 0.01 | ND> 0.01 | ND | 1.81 | ND> 0.02 |
| P-8 | 5237-010806-31 | 6-Aug-01 | 2.0 | X | | | | | ND>22 | ND>54.9 | ND>110 | - | - | - | - | - | - | - | - | - | 8.92 | 15,000. |
| | 5237-010806-37 | 6-Aug-01 | 30.0 | X | | | | | ND>27 | ND>67.6 | ND>135 | - | - | - | - | - | - | - | - | - | - | - |
| P-9 | 5237-010807-50 | 7-Aug-01 | 21.5 | | X | | | | ND>27 | ND>67.6 | ND>135 | - | - | - | - | - | - | - | - | - | 1.05 | 600. |
| P-10 | 5237-010803-23 | 3-Aug-01 | 26.0 | | | | | | ND>27 | ND>135 | Detect | ND> 27. | ND> 67.6 | ND | 0.1 | ND> 0.01 | ND> 0.01 | ND> 0.01 | ND> 0.01 | ND | 2.6 | ND> 0.02 |
| | 5237-010803-24 | 3-Aug-01 | 29.5 | | | | | | - | - | - | ND> 25. | ND> 62.5 | - | - | - | - | - | - | - | - | - |
| Surface Samples | | | | | | | | | | | | | | | | | | | | | | | |
| S-1 | 5237-010821-167 | 21-Aug-01 | 0.2 | | | | | | ND>20.8 | ND>52.1 | ND>104 | ND>20.8 | ND>52.1 | 1.29 | 2.14 | - | - | - | - | - | - | ND> 0.02 |
| S-2 | 5237-010821-168 | 21-Aug-01 | 0.2 | | | | | | ND>20.2 | ND>50.5 | ND>101 | - | - | 0.41 | 0.71 | - | - | - | - | - | - | ND> 0.02 |
| S-3 | 5237-010821-169 | 21-Aug-01 | 0.2 | | | | | | ND>20.8 | ND>52.1 | ND>104 | - | - | 0.88 | 1.8 | - | - | - | - | - | - | ND> 0.02 |
| S-4 | 5237-010821-170 | 21-Aug-01 | 0.2 | | | | | | ND>20.4 | ND>51 | ND>102 | - | - | ND | ND | - | - | - | - | - | - | ND> 0.02 |
| (duplicate) | 5237-010821-171 | 21-Aug-01 | 0.2 | | | | | | - | - | - | - | - | ND | ND | - | - | - | - | - | - | ND> 0.02 |
| S-5 | 5237-010821-172 | 21-Aug-01 | 0.2 | | | | | | ND>20.4 | ND>51 | ND>102 | - | - | ND | ND | - | - | - | - | - | - | ND> 0.02 |
| Outfall / Embankment Sample | | | | | | | | | | | | | | | | | | | | | | | |
| Fab 2 OF | 5237-010919-173 | 19-Sep-01 | 0.2 | | | | | | ND>51.9 | ND>130 | Detect | **3,720.** | **4,700.** | 29.5 | 91.2 | ND> 0.01 | ND> 0.01 | ND> 0.01 | ND> 0.01 | ND | 15.7 | 13,900. |
| Stormwater Catch Basin Sample | | | | | | | | | | | | | | | | | | | | | | | |
| CDA catch basin; chrome shed catch basin | CLI Composite 1-2 | 19-Jun-01 | NA | | | | | | - | - | - | ND>2,200 | **9,000.** | 1.4 | 2.6 | ND> 1.74 | 10. | ND> 1.74 | ND> 1.74 | ND | 1.3 | 0.4 |
| Reference Levels[1] | | | | | | | | | # | # | # | 500. | 500. | # | # | # | # | # | # | # | # | # |

Note:
bgs = below ground surface
BTEX = benzene, toluene, ethylbenzene, and xylenes
EPA = U.S. Environmental Protection Agency
mg/kg = milligrams/kilogram
ND = not detected above detection limit indicated
PAHs = polynuclear aromatic hydrocarbons
ppm = parts per million
TOC = total organic carbon
TPH = total petroleum hydrocarbons
**Bold** = Detected above Reference Standard
1 = Lowest guidance value provided in the NOAA Screening Quick Reference Tables for Freshwater Sediments (Rev. September 1999) based on Threshold Effects Level, Probable Effects Level, and Upper Effects Threshold



SCOEPA00010279

**TABLE 10**
**Summary of Analytical Results for Soil Samples**
**Detected Volatile Organic Compounds by EPA Method 8260**
Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Soil Sample Location | HAI Sample Number | Sample Date | Sample Depth (feet bgs) | Analytical Results - mg/ kg (ppm) | | | | | | | | | | | | | | | | | | | | | | Other VOCs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Aromatic VOCs (AVOCs) | | | | | | | | | | | | | | | | | | Halogenated VOCs (HVOCs) | | | | | | |
| | | | | Benzene | | n-Butylbenzene | | sec-Butylbenzene | | Ethylbenzene | | n-Propylbenzene | | Toluene | | 1,2,4-TMB | | 1,3,5-TMB | | Naphthalene | | Xylene | | cis-1,2-DCE | | trans-1,2-DCE | | TCE | | Vinyl Chloride | | |
| Push Probe Boring Samples | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P-1 | 5237-010817-142 | 17-Aug-01 | 30.0 | 8.63 | | ND> | 1. | 1.92 | | 15.7 | | ND> | 1. | 2.04 | | 16. | | 5.61 | | **60,900.** | | 23.88 | | ND> | 1. | ND> | 1. | ND> | 1. | ND> | 2. | IPB=2.11 |
| P-2 | 5237-010814-115 | 14-Aug-01 | 22.5 | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | ND> | 0.01 | ND> | 0.01 | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | ND> | 0.01 | ND |
| P-3 | 5237-010820-155 | 20-Aug-01 | 17.0 | ND> | 0.5 | 0.57 | | ND> | 0.5 | 3.36 | | ND> | 0.5 | ND> | 0.5 | 15.6 | | 4.59 | | **1,100.** | | 6.68 | | ND>0.5 | | ND> | 0.5 | ND> | 0.5 | ND> | 0.6 | 4-IPT=1.69<br>IPB=1.18 |
| P-4 | 5237-010810-80 | 10-Aug-01 | 17.5 | ND> | 0.02 | ND> | 0.02 | ND> | 0.02 | 0.2 | | 0.04 | | ND> | 0.02 | 0.664 | | 0.181 | | **64.2** | | 0.4 | | ND> | 0.02 | ND> | 0.02 | ND> | 0.02 | ND> | 0.04 | 4-IPT=0.068 |
| P-5 | 5237-010813-92 | 13-Aug-01 | 9.5 | ND> | 0.1 | 0.243 | | ND> | 0.1 | 1.38 | | 0.225 | | 0.15 | | 7.12 | | 2.05 | | **684.** | | 3.67 | | ND> | 0.1 | ND> | 0.1 | ND> | 0.1 | ND> | 0.12 | 4-IPT=0.919 |
| P-7 | 5237-010808-64 | 8-Aug-01 | 22.5 | ND> | 0.005 | 0.011 | | 0.01 | | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | 0.011 | | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | ND> | 0.01 | Acetone = 0.128 |
| (duplicate) | 5237-010808-65 | 8-Aug-01 | 22.5 | ND> | 0.005 | ND> | 0.005 | 0.006 | | ND> | 0.005 | 0.007 | | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | ND> | 0.01 | ND> | 0.01 | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | ND> | 0.01 | Acetone = 0.125 |
| P-10 | 5237-010803-23 | 3-Aug-01 | 26.0 | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | ND> | 0.01 | ND> | 0.01 | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | ND> | 0.01 | ND |
| Outfall / Embankment Sample | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fab 2 OF | 5237-010919-173 | 19-Sep-01 | 0.2 | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | 0.029 | | ND> | 0.01 | ND> | 0.005 | ND> | 0.005 | ND> | 0.005 | ND> | 0.01 | ND |
| Stormwater Catch Basin Sample | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CDA catch basin; chrome shed catch basin | CLI Composite 1-2 | 19-Jun-01 | NA | ND> | 1.74 | ND> | 1.74 | ND> | 1.74 | ND> | 1.74 | ND> | 1.74 | 10. | | ND> | 1.74 | ND> | 1.74 | ND> | 1.74 | ND> | 1.74 | ND> | 1.74 | ND> | 1.74 | ND> | 1.74 | ND> | 1.74 | ND |
| Reference Levels [1] | | | | # | | # | | # | | # | | # | | # | | # | | # | | 0.6 [3] | | # | | # | | # | | # | | # | | # |

# = not established
bgs = below ground surface
DCE = dichloroethene
EPA = U.S. Environmental Protection Agency
HVOCs = halogenated volatile organic compounds
ND = not detected above detection limit indicated
IPB = isopropylbenzene
IPT = isopropyltoluene
ppb = parts per billion
TCE = trichloroethene
TMB = trimethylbenzene
VOCs = volatile organic compounds

1 = Reference Level indicated is the lowest guidance value provided in the NOAA Screening Quick Reference Tables for Freshwater Sediments (Rev. September 1999) based on Threshold Effects Level, Probable Effects Level, and Upper Effects Threshold
2 = Reference Level based on Threshold Effects Level
3 = Reference Level based on Upper Effects Threshold

**Bold** = Detected above lowest identified Reference Level

Updated: 11/20/01: RBE
File Name: 10 - 13 Soil Rslts Master



SCOEPA00010280

**TABLE 11**
**Summary of Analytical Results for Soil Samples**
**Polynuclear Aromatic Hydrocarbons**
Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| PAHs by EPA Method 8270C | | | | Analytical Results mg/kg (ppm) | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Carcinogenic PAHs | | | | | | | | Non-carcinogenic PAHs | | | | | | | | | | | |
| Soil Sample Location | HAI Sample Number: | Sample Date | Sample Depth (feet bgs) | Benz (a) anthracene | Benzo (b) fluoranthene | Benzo (k) fluoranthene | Benzo (a) pyrene | Chrysene | Dibenzo (ah) anthracene | Indeno (1,2,3-cd) pyrene | Acenaphthene | Acenaphthylene | Anthracene | Benzo (ghi) perylene | Fluoranthene | Fluorene | Naphthalene | Phenanthrene | Pyrene | Total Carcinogenic PAHs | Total PAHs |
| Push Probe Boring Samples | | | | | | | | | | | | | | | | | | | | | |
| P-1 | 5237-010817-142 | 17-Aug-01 | 30.0 | **817.** | 638. | **743.** | **1,280.** | **940.** | **143.** | **623.** | **2,770.** | **151.** | **997.** | **1,120.** | **3,020.** | **1,240.** | **10,900.** | **6,650.** | **3,400.** | 5,184. | 35,432. |
| P-2 | 5237-010814-115 | 14-Aug-01 | 22.5 | **1.** | 0.948 | 0.833 | **1.3** | **1.5** | ND> 0.335 | **0.617** | **5.2** | ND> 0.335 | **1.7** | **1.1** | **4.** | **1.9** | ND> 0.335 | **4.4** | **4.6** | 6.2 | 29.1 |
| P-3 | 5237-010820-155 | 20-Aug-01 | 17.0 | **220.** | 163. | **141.** | **204.** | **247.** | **25.4** | **115.** | **523.** | **48.7** | **208.** | **201.** | **713.** | **282.** | 1,790. | **1,600.** | **827.** | 1,115.4 | 7,308.1 |
| P-4 | 5237-010810-80 | 10-Aug-01 | 17.5 | **18.3** | 10. | 8.2 | **18.1** | **21.3** | **2.3** | **7.6** | **35.1** | **4.** | **25.1** | **13.1** | **56.5** | **23.9** | **41.1** | **83.5** | **63.2** | 85.8 | 431.3 |
| P-5 | 5237-010813-92 | 13-Aug-01 | 9.5 | **207.** | 103. | **103.** | **205.** | **245.** | **24.2** | **83.2** | **463.** | **36.** | **322.** | **149.** | **655.** | **307.** | **905.** | **1,120.** | **772.** | 970.4 | 5,699.4 |
| P-6 | 5237-010802-04 | 2-Aug-01 | 10.0 | **3.** | 5. | 3.8 | **8.8** | **4.2** | ND> 0.67 | **3.3** | ND> 0.67 | **1.5** | **0.79** | **5.2** | **5.8** | ND> 0.67 | ND> 0.67 | **1.5** | **7.1** | 28.1 | 50. |
| P-7 | 5237-010808-64 | 8-Aug-01 | 22.5 | ND> 0.67 | ND> 0.67 | ND> 0.67 | ND> 0.67 | **1.9** | ND> 0.67 | ND> 0.67 | **1.4** | ND> 0.67 | ND> 0.67 | ND> 0.67 | **0.687** | **5.6** | ND> 0.67 | **5.8** | **1.** | 1.9 | 16.4 |
| (duplicate) | 5237-010808-65 | 8-Aug-01 | 22.5 | ND> 0.67 | ND> 0.67 | ND> 0.67 | ND> 0.67 | ND> 0.67 | ND> 0.67 | ND> 0.67 | ND> 0.67 | ND> 0.67 | ND> 0.67 | ND> 0.67 | ND> 0.67 | **1.6** | ND> 0.67 | **1.8** | ND> 0.67 | ND | 3.4 |
| P-10 | 5237-010803-23 | 3-Aug-01 | 26.0 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | 0.076 | ND | 0.1 |
| Surface Samples | | | | | | | | | | | | | | | | | | | | | |
| S-1 | 5237-010821-167 | 21-Aug-01 | 0.2 | **0.153** | 0.256 | 0.159 | **0.322** | **0.201** | ND> 0.067 | 0.199 | ND> 0.067 | ND> 0.067 | ND> 0.067 | **0.334** | 0.211 | ND> 0.067 | ND> 0.067 | 0.08 | **0.228** | 1.29 | 2.14 |
| S-2 | 5237-010821-168 | 21-Aug-01 | 0.2 | ND> 0.067 | 0.081 | 0.07 | 0.11 | 0.069 | ND> 0.067 | 0.077 | ND> 0.067 | ND> 0.067 | ND> 0.067 | 0.143 | 0.069 | ND> 0.067 | ND> 0.067 | ND> 0.067 | 0.087 | 0.41 | 0.7 |
| S-3 | 5237-010821-169 | 21-Aug-01 | 0.2 | **0.119** | 0.156 | 0.109 | **0.213** | **0.167** | ND> 0.067 | 0.113 | ND> 0.067 | ND> 0.067 | ND> 0.067 | 0.197 | 0.259 | ND> 0.067 | ND> 0.067 | 0.149 | **0.315** | 0.88 | 1.8 |
| S-4 | 5237-010821-170 | 21-Aug-01 | 0.2 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND | ND |
| (duplicate) | 5237-010821-171 | 21-Aug-01 | 0.2 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND | ND |
| S-5 | 5237-010821-172 | 21-Aug-01 | 0.2 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND | ND |
| Outfall / Embankment Sample | | | | | | | | | | | | | | | | | | | | | |
| Fab 2 OF | 5237-010919-173 | 19-Sep-01 | 0.2 | **7.** | ND> 6.67 | 6.7 | **7.1** | **8.7** | ND> 6.67 | ND> 6.67 | ND> 6.67 | ND> 6.67 | ND> 6.67 | ND> 6.67 | **21.** | ND> 6.67 | ND> 6.67 | **17.5** | **23.2** | 29.5 | 91.2 |
| Stormwater Catch Basin Sample | | | | | | | | | | | | | | | | | | | | | |
| CDA catch basin; chrome shed catch basin | CLI Composite 1-2 | 19-Jun-01 | NA | **0.2** | 0.3 | 0.2 | **0.2** | **0.3** | ND> 0.17 | 0.2 | ND> 0.17 | ND> 0.17 | ND> 0.17 | 0.2 | 0.4 | ND> 0.17 | ND> 0.17 | 0.2 | **0.4** | 1.4 | 2.6 |
| Reference Levels [1] | | | | 0.108 [4] | # | 13.4 [4] | 0.15 [4] | 0.166 [4] | 0.033 [4] | 0.33 [3] | 0.29 [3] | 0.16 [3] | 0.057 [4] | 0.3 [3] | 0.423 [4] | 0.077 [4] | 0.176 [4] | 0.204 [4] | 0.195 [4] | # | # |

Note:
# = Reference Level not established
bgs = below ground surface
EPA = U.S. Environmental Protection Agency
ND = not detected above detection limit indicated
PAHs = polynuclear aromatic hydrocarbons
ppm = parts per million
mg/kg = milligrams per kilogram

1 = Reference Level indicated is the lowest guidance value provided in the NOAA Screening Quick Reference Tables for Freshwater Sediments (Rev. September 1999) based on Threshold Effects Level, Probable Effects Level, and Upper Effects Threshold
2 = Reference Level based on Threshold Effects Level
3 = Reference Level based on Upper Effects Threshold
4 = Reference Level based on Concensus-Based Threshold Effects Level, MacDonald, Ingersoll, and Berger, *Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems* , January 13, 2000
**Bold** = Detected above lowest identified Reference Level



SCOEPA00010281

**TABLE 12**
**Summary of Analytical Results for Soil Samples**
**Detected Semi-Volatile Organic Compounds by EPA Method 8270C**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Phenols by EPA Method 8270 | | | | Analytical Results mg/kg (ppm) | | | | |
|---|---|---|---|---|---|---|---|---|
| Soil Sample Location | HAI Sample Number | Sample Date | Sample Depth (feet bgs) | 2-Methylnaphthalene | Carbazole | Dibenzofuran | Other SVOCs | PAHs |
| Push Probe Boring Samples | | | | | | | | |
| P-1 | 5237-010817-142 | 17-Aug-01 | 30.0 | 2,180. | 413. | 230. | ND | See Table 6 |
| P-2 | 5237-010814-115 | 14-Aug-01 | 22.5 | ND> 0.3 | ND> 0.7 | 0.7 | bis(2-ethylhexy)phthalate=4.3<br>butyl benzyl phthalate = 1.4<br>di-n-butyl phthalate =0.405 | See Table 6 |
| P-3 | 5237-010820-155 | 20-Aug-01 | 17.0 | 683. | 44. | 49.3 | ND | See Table 6 |
| P-4 | 5237-010810-80 | 10-Aug-01 | 17.5 | 25.1 | 2.1 | 3.5 | ND | See Table 6 |
| P-5 | 5237-010813-92 | 13-Aug-01 | 9.5 | 553. | 68.7 | 40. | 1,2-diphenylhydrazine=3.5 | See Table 6 |
| P-6 | 5237-010802-04 | 2-Aug-01 | 10.0 | ND> 0.67 | ND> 0.67 | ND> 0.67 | ND | See Table 6 |
| P-7 | 5237-010808-64 | 8-Aug-01 | 22.5 | ND> 0.67 | ND> 0.67 | ND> 0.67 | 7,12-dimethylbenz(a)anthracene=1.5 | See Table 6 |
| (duplicate) | 5237-010808-65 | 8-Aug-01 | 22.5 | ND> 0.67 | ND> 0.67 | ND> 0.67 | ND | See Table 6 |
| P-10 | 5237-010803-23 | 3-Aug-01 | 26.0 | ND> 0.067 | ND> 0.067 | ND> 0.067 | ND | See Table 6 |
| Surface Samples | | | | | | | | |
| S-1 | 5237-010821-167 | 21-Aug-01 | 0.2 | ND> 0.67 | ND> 0.67 | ND> 0.67 | ND | See Table 6 |
| S-2 | 5237-010821-168 | 21-Aug-01 | 0.2 | ND> 0.67 | ND> 0.69 | ND> 0.67 | ND | See Table 6 |
| S-3 | 5237-010821-169 | 21-Aug-01 | 0.2 | ND> 0.67 | ND> 0.134 | ND> 0.67 | 2-chlorophenol = 0.0707<br>phenol = 0.077 | See Table 6 |
| S-4 | 5237-010821-170 | 21-Aug-01 | 0.2 | ND> 0.67 | ND> 0.134 | ND> 0.67 | ND | See Table 6 |
| (duplicate) | 5237-010821-171 | 21-Aug-01 | 0.2 | ND> 0.67 | ND> 0.134 | ND> 0.67 | ND | See Table 6 |
| S-5 | 5237-010821-172 | 21-Aug-01 | 0.2 | ND> 0.67 | ND> 0.134 | ND> 0.67 | ND | See Table 6 |
| Outfall / Embankment Sample | | | | | | | | |
| Fab 2 OF | 5237-010919-173 | 19-Sep-01 | 0.2 | ND> 6.67 | ND> 13.4 | ND> 6.67 | ND | See Table 6 |
| Stormwater Catch Basin Sample | | | | | | | | |
| CDA catch basin; chrome shed catch basin | CLI Composite 1-2 | 19-Jun-01 | NA | - | - | - | ND | See Table 6 |
| Reference Levels [1] | | | | # | # | # | phenol = 0.048, others = # | |

Note: bgs = below ground surface; EPA = U.S. Environmental Protection Agency; mg/kg = milligrams/kilogram; ND = not detected above detection limit indicated; ppm = parts per million; # = not established

1 = Lowest guidance value provided in the NOAA Screening Quick Reference Tables for Freshwater Sediments (Rev. September 1999) based on Threshold Effects Level, Probable Effects Level, and Upper Effects Threshold

Updated: 11/20/01 RBE
File Name: 10 - 13 Soil Rslts Master




SCOEPA00010282

**Table 13**
**Summary of Analytical Results for Soil Samples: Metals**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Soil Sample Location | HAI Sample Number | Sample Date | Sample Depth (feet bgs) | Analytical Results - mg/kg (ppm) Total Metals by EPA Methods 6010, 200.7 and/or 7000 Series | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Antimony | Arsenic | Cadmium | Chromium | Cobalt | Copper | Iron | Lead | Manganese | Nickel | Selenium | Silver | Titanium | Vanadium | Zinc |
| Push Probe Boring Samples | | | | | | | | | | | | | | | | | | |
| P-1 | 5237-010817-142 | 17-Aug-01 | 30.0 | ND> 0.5 | 1.16 | ND> 1. | 8.74 | 7.54 | 8.01 | **12,500.** | 1.58 | 127. | 9.86 | ND> 0.5 | ND> 0.5 | 724. | 41.7 | 26.1 |
| P-2 | 5237-010814-115 | 14-Aug-01 | 22.5 | 1.39 | 4.05 | 1.04 | 16.4 | 12.6 | **37.6** | **24,500.** | **75.3** | 246. | **45.3** | ND 0.5 | ND> 0.5 | 1,570. | 65.2 | **244.** |
| P-3 | 5237-010820-152 | 20-Aug-01 | 6.5 | 0.96 | 3.12 | ND> 1. | 12.3 | 13.2 | 12.6 | **23,400.** | 1.04 | 269. | 14.8 | ND> 0.5 | ND> 0.5 | 1,520. | 65.4 | 42.6 |
| | 5237-010820-155 | 20-Aug-01 | 17.0 | 0.79 | 3.28 | ND> 1. | 10.9 | 11.8 | 15.5 | **21,700.** | 9.21 | 190. | 14.7 | ND> 0.5 | ND> 0.5 | 1,270. | 57.7 | 44.4 |
| P-4 | 5237-010810-80 | 10-Aug-01 | 17.5 | 1.45 | 3.27 | ND> 0.5 | 13.4 | 13.2 | 15.9 | **25,200.** | 21.3 | 220. | 15.6 | ND> 0.5 | ND> 0.5 | 1,510. | 65.7 | 105. |
| P-5 | 5237-010813-92 | 13-Aug-01 | 9.5 | 0.97 | 3.39 | ND> 0.5 | 10.9 | 10.9 | 11.1 | **22,200.** | 8.07 | 201. | 13.4 | ND> 0.5 | ND> 0.5 | 1,140. | 54.8 | 38.7 |
| P-6 | 5237-010802-04 | 2-Aug-01 | 10.0 | 1.04 | 3.01 | ND> 0.5 | 11.5 | 11.5 | 14.3 | **21,900.** | 3.57 | 227. | 13.9 | ND> 0.5 | ND> 0.5 | 1,180. | 55.8 | 44.4 |
| P-7 | 5237-010808-64 | 8-Aug-01 | 22.5 | 1.15 | 2.09 | ND> 0.5 | 19. | 9.62 | 20.4 | **21,100.** | 1.73 | 210. | 15.3 | ND> 0.5 | ND> 0.5 | 1,240. | 66.8 | 40.8 |
| (duplicate) | 5237-010808-65 | 8-Aug-01 | 22.5 | 1.1 | 2.49 | ND> 0.5 | 20.4 | 10.4 | 21.7 | **22,700.** | 1.86 | 228. | 17.2 | ND> 0.5 | ND> 0.5 | 1,180. | 67.3 | 77. |
| P-8 | 5237-010806-31 | 6-Aug-01 | 2.0 | 0.95 | 3.1 | ND> 0.5 | 11.7 | 12.3 | 10.7 | **23,700.** | 11.4 | 220. | 13.8 | ND> 0.5 | ND> 0.5 | 1,310. | 63.3 | 46.5 |
| P-9 | 5237-010807-50 | 7-Aug-01 | 21.5 | 1.85 | 4.2 | ND> 0.5 | 13.9 | - | 28.2 | **20,000.** | 31.5 | 268. | 14. | ND> 0.5 | ND> 0.5 | 1,040. | 50. | **126.** |
| P-10 | 5237-010803-23 | 3-Aug-01 | 26.0 | 1.3 | 2.68 | ND> 1. | 12.6 | 10.1 | 19.3 | **18,000.** | 32.6 | 227. | 12.8 | ND> 0.5 | ND> 0.5 | 961. | 47.5 | 66.4 |
| Surface Samples | | | | | | | | | | | | | | | | | | |
| S-1 | 5237-010821-167 | 21-Aug-01 | 0.2 | 1.17 | 2.54 | ND> 1. | 9.67 | 15.7 | 13.6 | **33,500.** | 1.97 | 380. | 10.6 | ND> 0.5 | ND> 0.5 | 1,920. | 89.8 | 104. |
| S-2 | 5237-010821-168 | 21-Aug-01 | 0.2 | 0.8 | 2.97 | ND> 1. | 15. | 14.3 | 14.6 | **26,900.** | 1.61 | 346. | 15. | ND> 0.5 | ND> 0.5 | 1,650. | 74.6 | 50. |
| S-3 | 5237-010821-169 | 21-Aug-01 | 0.2 | 1.02 | 3.26 | ND> 1. | 16.7 | 13.6 | 21.9 | **25,500.** | 10.1 | 366. | 16.3 | ND> 0.5 | ND> 0.5 | 1,260. | 68.4 | 70.6 |
| S-4 | 5237-010821-170 | 21-Aug-01 | 0.2 | 1.38 | 4.26 | ND> 1. | 17.7 | 19.1 | 18.4 | **37,700.** | 1.98 | 758. | **24.** | ND> 0.5 | ND> 0.5 | 1,850. | 97.2 | 51.1 |
| (duplicate) | 5237-010821-171 | 21-Aug-01 | 0.2 | 1.49 | 4.4 | ND> 1. | 19.5 | 21.3 | 19.1 | **38,000.** | 2.6 | 756. | **24.8** | ND> 0.5 | ND> 0.5 | 1,800. | 102. | 51.2 |
| S-5 | 5237-010821-172 | 21-Aug-01 | 0.2 | 1.19 | 3.72 | ND> 1. | 13.5 | 15. | 25.1 | **31,600.** | 3.82 | 544. | 18. | ND> 0.5 | ND> 0.5 | 1,370. | 75.7 | 53.7 |
| Outfall / Embankment Sample | | | | | | | | | | | | | | | | | | |
| Fab 2 OF | 5237-010919-173 | 19-Sep-01 | 0.2 | **3.31** | 2.34 | ND> 1. | 30.9 | 7.21 | **286.** | 16.7 | 31.7 | 351. | 14.1 | ND> 1. | ND> 1. | 828. | 49.1 | **846.** |
| Stormwater Catch Basin Sample | | | | | | | | | | | | | | | | | | |
| CDA catch basin; chrome shed catch basin | CLI Composite 1-2 | 19-Jun-01 | NA | ND> 0.5 | 1.1 | 0.55 | 13. | 4.4 | **32.** | **10,000.** | 16. | 110. | 8.3 | ND> 0.5 | 1.3 | 430. | 25. | **360.** |
| Reference Levels [1] | | | | 3. [3] | 9.79 [2] | 0.99 [2] | 43.4 [2] | # | 31.6 [2] | 4,000. [3] | 35.8 [2] | 1,100. [3] | 22.7 [2] | # | 4.5 [3] | # | # | 121. [2] |

Note:
bgs = below ground surface
EPA = U.S. Environmental Protection Agency
mg/kg = milligrams/kilogram
ND = not detected above detection limit indicated
ppm = parts per million
# = Reference Levels not established

1 = Lowest guidance value provided in the NOAA Screening Quick Reference Tables for Freshwater Sediments (Rev. September 1999) based on Threshold Effects Level, Probable Effects Level, and Upper Effects Threshold
2 = Based on Threshold Effects Level
3 = Based on Upper Effects Threshold
4 = Concensus-Based Threshold Effects Level, MacDonald, Ingersoll, and Berger, *Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems* , January 13, 2000
**Bold** = Detected above lowest identified Reference Level

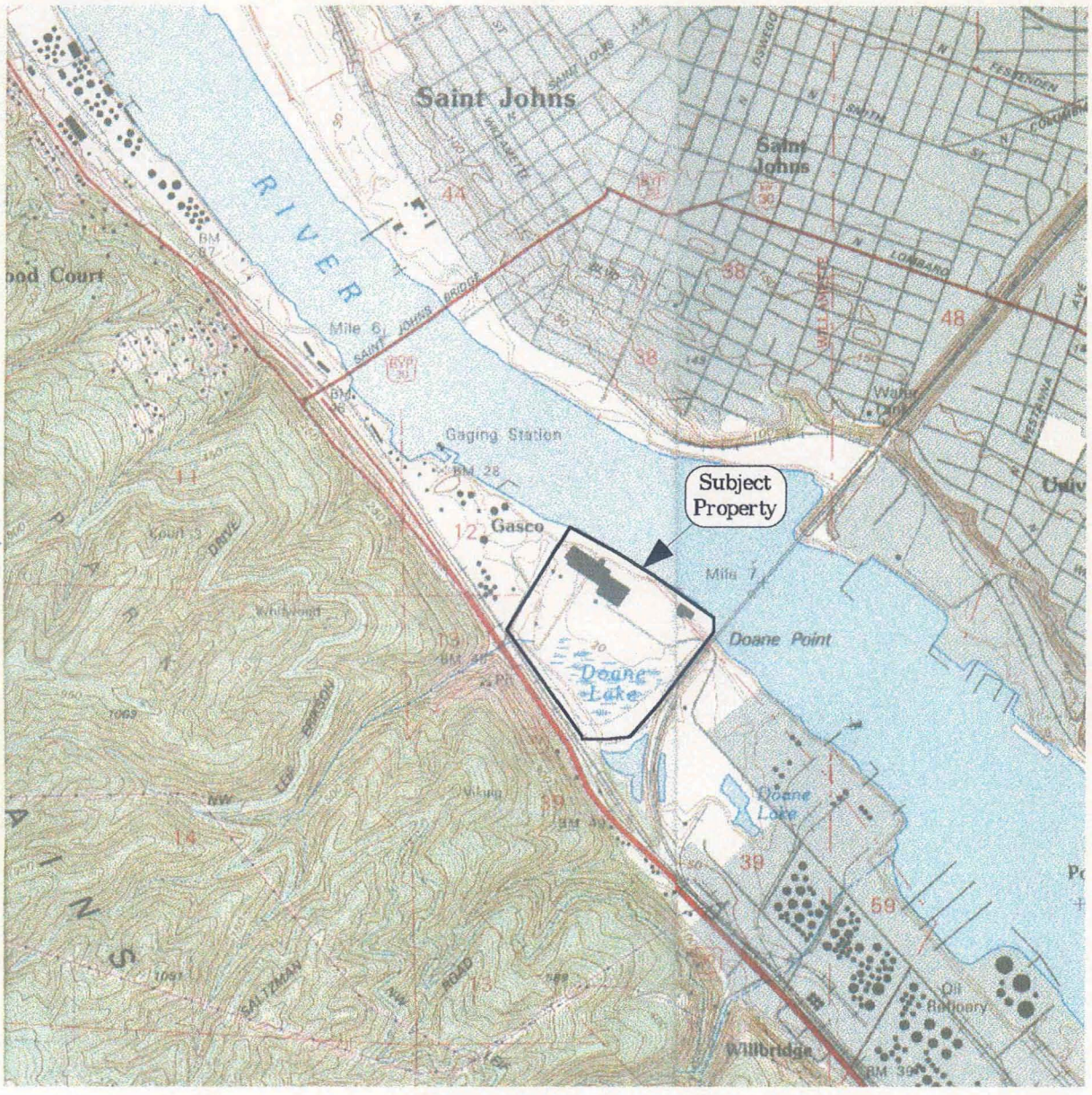
Updated: 11/20/01 RBE
File Name: 10 - 13 Soil Rslts Master



SCOEPA00010283

# FIGURES

SCOEPA00010284




0 2,000 4,000

Scale in Feet
Contour Interval = 10 feet

Note: Base Map from Linnton (1990) and Portland (1990), Oregon, USGS 7.5-Minute Quadrangles

| | | | |
|---|---|---|---|
| Project No. 5237<br>October 2001 | **HAHN AND ASSOCIATES**<br>**INCORPORATED**<br>ENVIRONMENTAL MANAGEMENT<br>434 NW SIXTH AVENUE, SUITE 203<br>PORTLAND, OREGON 97209<br>(503) 796-0717 | **LOCATION MAP**<br>Wacker Siltronic Corporation<br>7200 NW Front Avenue<br>Portland, Oregon | **FIGURE**<br>**1** |

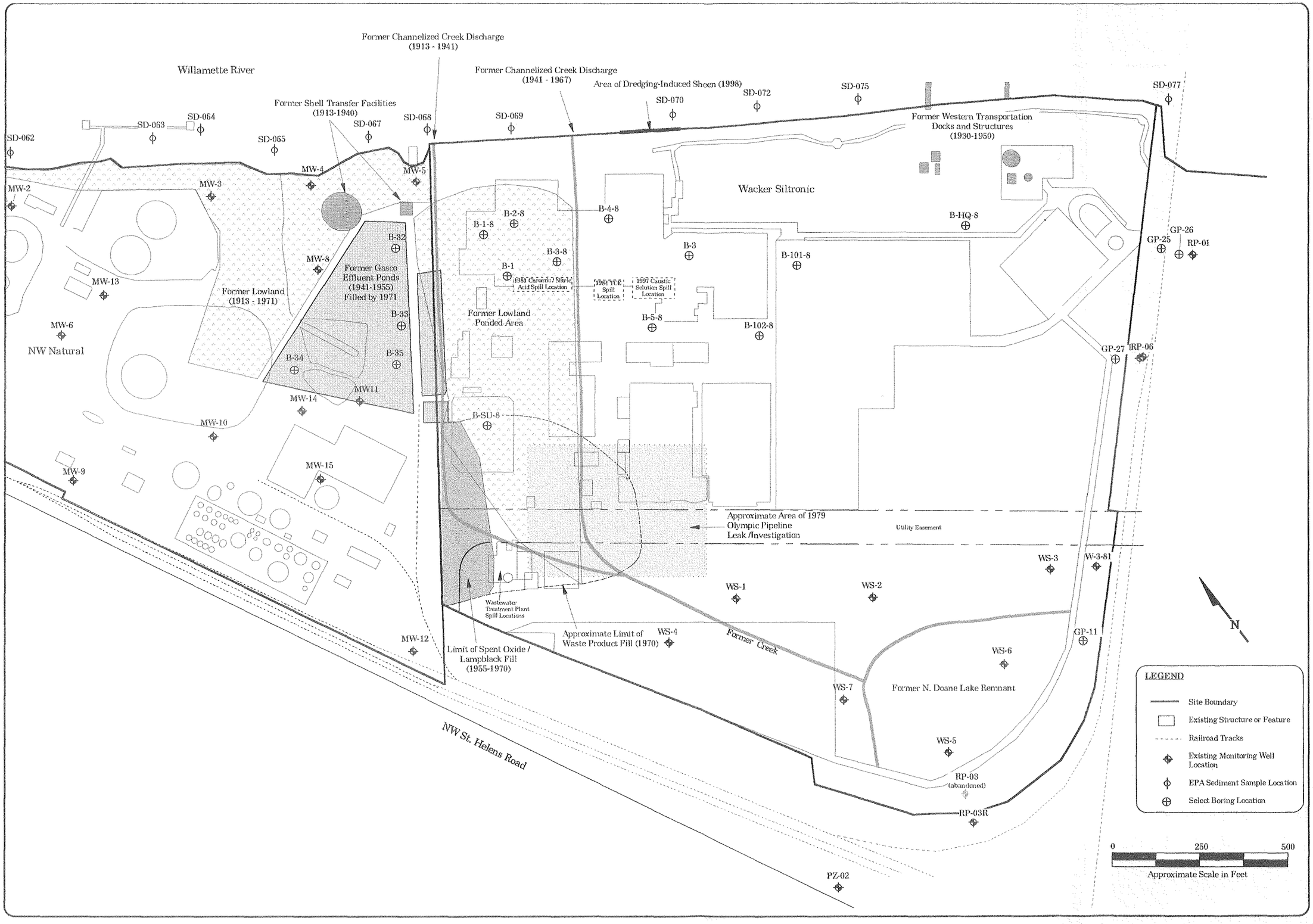



**Figure 2**

**Site and Historical Features Map**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon


HAHN & ASSOCIATES, INC.
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717


October 2001

Project No. 5237

SCOEPA00010286

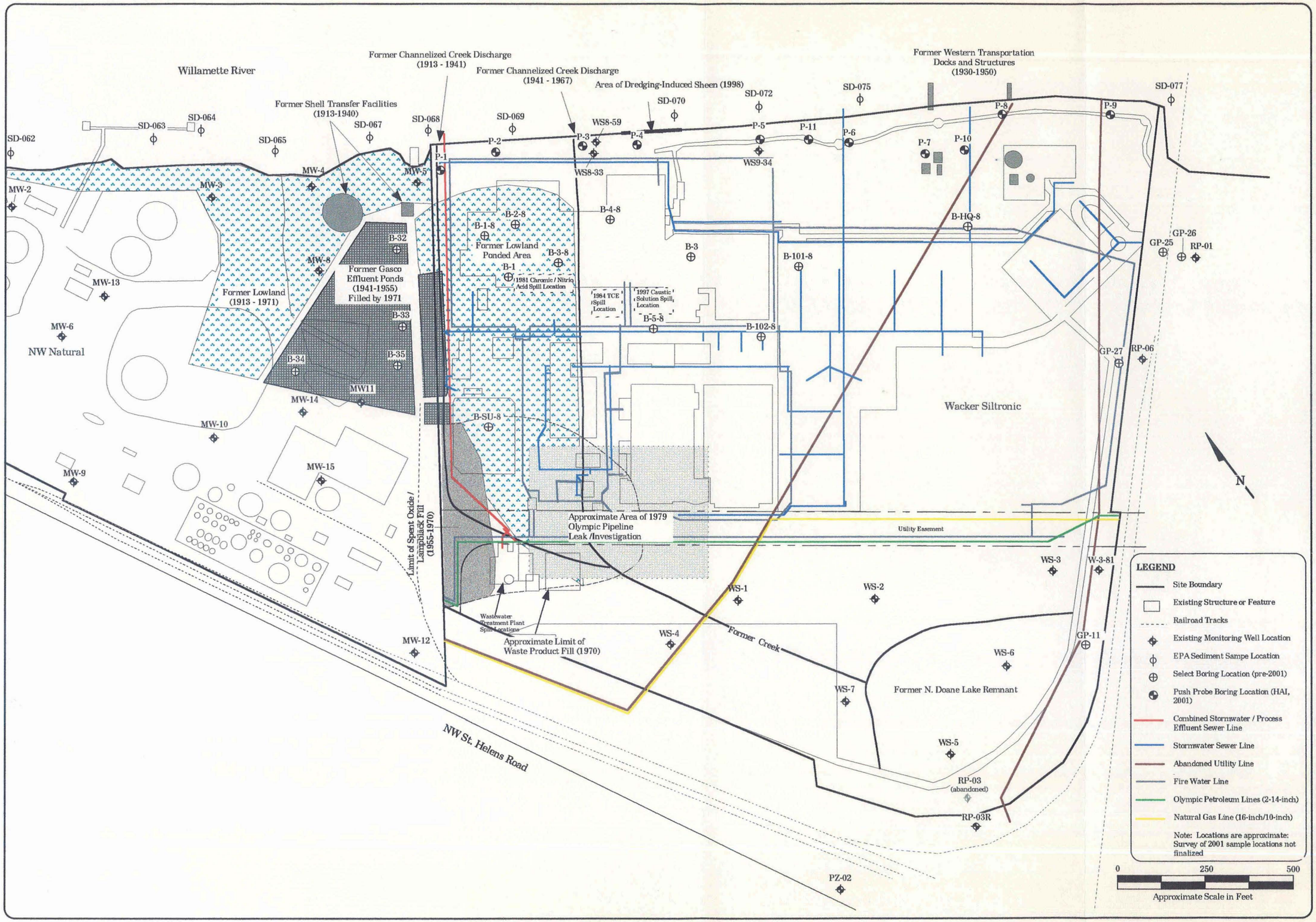



**Figure 3**

**Monitoring Well and Push Probe Location Map**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon


**HAHN & ASSOCIATES, INC.**
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717


**October 2001**

**Project No. 5237**

SCOEPA00010287

Willamette River

Fab 1 Stormwater Outfall Sampling Point

Stormwater Catch Basins Sampled by Wacker June 19, 2001

Fab 2 Stormwater Outfall Sampling Point

Admin. Bldg. Stormwater Outfall Sampling Point

S-1

S-2

S-3

S-4

S-5

Former Gasco Effluent Ponds (1941-1955) Filled by 1971

Former Lowland (1913 - 1971)

Former Lowland Ponded Area

Former Lowland Ponded Area

NW Natural

Wacker Siltronic

Limit of Spent Oxide / Lampblack Fill (1955-1970)

Approximate Area of 1979 Olympic Pipeline Leak /Investigation

Utility Easement

Former Creek

Former N. Doane Lake Remnant

NW St. Helens Road

N

**LEGEND**

- Site Boundary
- Existing Structure or Feature
- Railroad Tracks
- Surface Soil Sampling Location
- Stormwater Catch Basin
- Combined Stormwater / Process Effluent Sewer Line
- Stormwater Sewer Line
- Abandoned Utility Line
- Fire Water Line
- Olympic Petroleum Lines (2-14-inch)
- Natural Gas Line (16-inch/10-inch)

0 250 500

Approximate Scale in Feet

**Figure 4**

**Surface Soil, Catch Basin, and Outfall Sampling Locations**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

**HAHN & ASSOCIATES, INC.**
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717

**November 2001**

**Project No. 5237**

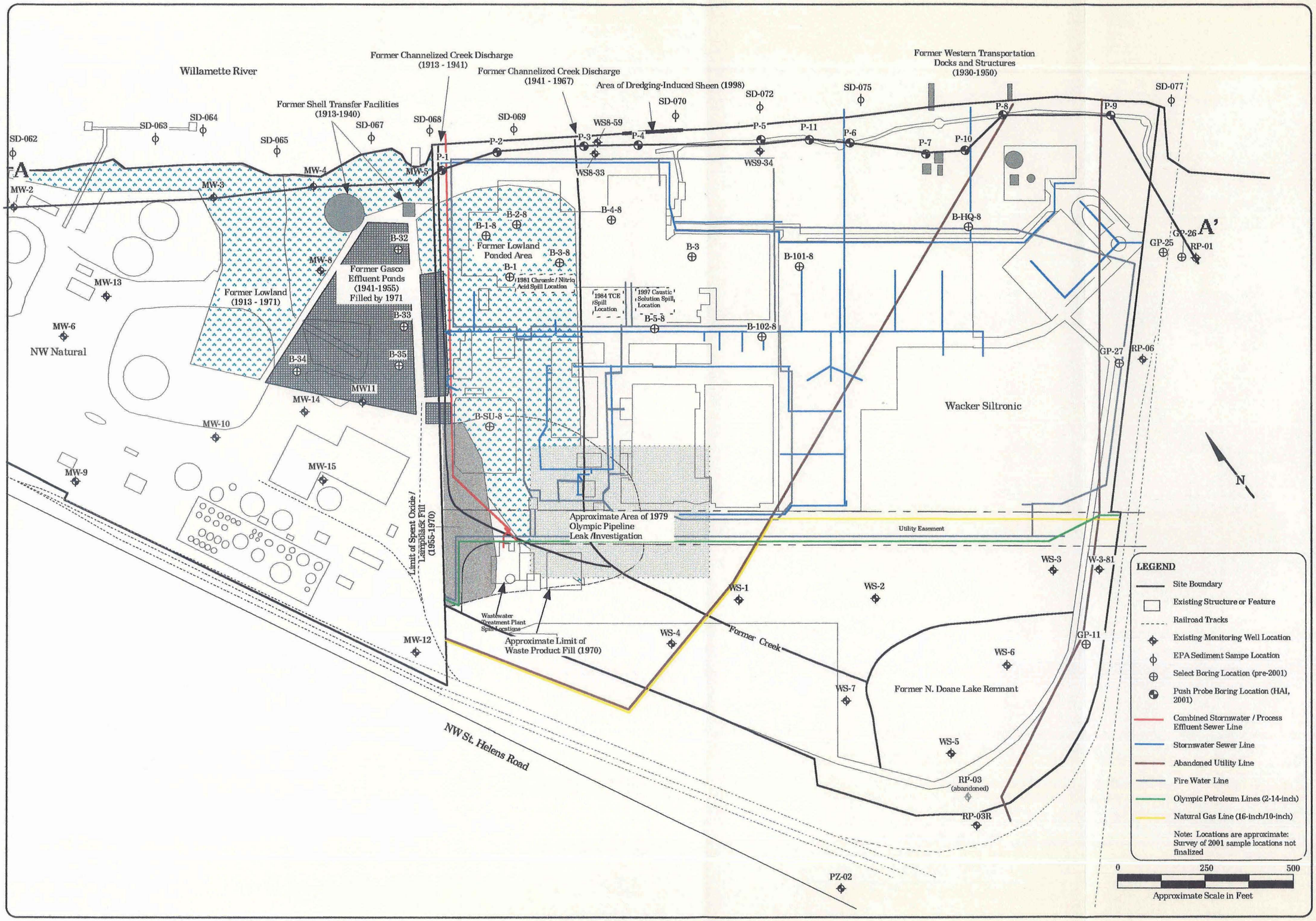



**Figure 5**

**Cross-Section Location Map**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon


**HAHN & ASSOCIATES, INC.**
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717


**August 2001**

**Project No. 5237**

SCOEPA00010289

Northwest

A

NW Natural

Wacker Siltronic

BNSF

A'

Southeast

MW-02 MW-3 MW-04 MW-5-175 P-1 P-2 P-3 P-4 P-5 P-11 P-6 P-7 P-10 P-8 P-9 RP-01-65

Fill Unit

Silt Unit

Alluvial Unit

WS8-33

WS8-59

WS9-34

Fill Unit

Silt Unit

?

?

Bedrock Unit

Alluvial Unit

Elevation (feet mean sea level)

25

0

-25

-50

-75

-100

-125

-150

**LEGEND**

Water Table

Hydrogeologic Boundary

MW- Monitoring Well / Boring ID

Lithologic Log

Screened Interval

**LITHOLOGY KEY**

- Gravels/Gravel Sand Mixtures
- Silty Gravels
- Sands, Gravelly Sands
- Silty Sands
- Silts
- Inorganic Clay
- Basalt Bedrock

0 250 500

Approximate Scale in Feet

Vertical Exaggeration 10X

**Figure 6**

**Hydrogeologic Cross Section A - A'**

Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

**HAHN AND ASSOCIATES, INC.**

ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
(503) 796-0717

**August 2001**

**Project No. 5237**

SCOEPA00010290

# APPENDICES

SCOEPA00010291

A

# APPENDIX A

## Push Probe Boring Logs:
## August 2001

## Lithology and Soil Sampling



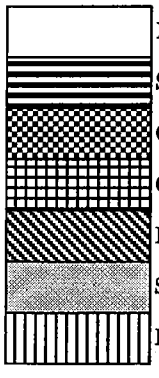
SCOEPA00010293

# KEY TO BORING LOGS

Soil classification in this report is based upon visual and manual field observations which include moisture, consistency, plasticity and grading estimates and should not be construed to imply field or laboratory testing unless presented herein. Soils are classified in accordance with the Unified Soil Classification System. Stratigraphic boundaries are approximate representations only. No warranty is provided as to the continuity of soil strata between borings.

| UNIFIED SOIL CLASSIFICATION SYSTEM (USCS) | | | | | |
|---|---|---|---|---|---|
| MAJOR DIVISIONS | | | GROUP SYMBOLS | | TYPICAL NAMES |
| COURSE GRAINED SOILS | GRAVELS<br>More Than Half the Course Fraction is Larger Than No. 4 Sieve Size | Clean Gravels With Little or No Fines | GW | | Well Graded Gravels, Gravel-Sand Mixtures |
| | | | GP | | Poorly Graded Gravels, Gravel-Sand Mixtures |
| | | Gravels With Over 12% Fines | GM | | Silty Gravels, Poorly Graded Gravel-Sand-Silt Mixtures |
| | | | GC | | Clayey Gravels, Poorly Graded Gravel-Sand-Clay Mixtures |
| More Than Half is Larger Than #200 Sieve | SANDS<br>More Than Half the Course Fraction is Smaller Than No. 4 Sieve Size | Clean Sands With Little or No Fines | SW | | Well Graded Sands, Gravelly Sands |
| | | | SP | | Poorly Graded Sands, Gravelly Sands |
| | | Sands With Over 12% Fines | SM | | Silty Sands, Poorly Graded Sand-Silt Mixtures |
| | | | SC | | Clayey Sands, Poorly Graded Sand-Clay Mixtures |
| FINE GRAINED SOILS | SILTS AND CLAYS<br>Liquid Limit Less Than 50% | | ML | | Inorganic Silts and Very Fine Sands, Rock Flour, Silty or Clayey Fine Sands, or Clayey Silts with Slight Plasticity |
| | | | CL | | Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays |
| | | | OL | | Organic Clays and Organic Silty Clays of Low Plasticity |
| More Than Half is Smaller Than #200 Sieve | SILTS AND CLAYS<br>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, Organic Silts |
| HIGHLY ORGANIC SOILS | | | Pt | | Peat and Other Highly Organic Soils |

**LEGEND FOR BORING LOGS**



- Blank Casing
- Slotted Screen
- Cement Grout
- Concrete
- Bentonite
- Sand Pack
- Fill Material

**ABBREVIATIONS**

| | |
|---|---|
| NA | Not Applicable |
| ND | Not Detected Above Detection Limit |
| NS | Not Sampled |
| TPH-Dx | Diesel/Oil-Range Total Petroleum Hydrocarbons |
| ppb | Parts Per Billion |
| SPT | Standard Penetration Test |
| ▽ | Measured Static Water Level in Well |
| ▼ | Estimated Water Level During Drilling |

Updated: 10/19/01 RBE
File: 5237 Boring Log Key

HAHN AND ASSOCIATES, INC.

SCOEPA00010294

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-1** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: | DRILL FINISH Time: |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | 10:15 | 13:25 |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | Date: 08/17/01 | Date: 08/17/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | DEPTH (feet) | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|
| Bentonite Chips | | | | | 1 | GP | Surface: Gravel, grey, dry, no petroleum odor, no sheen (0 to 0.5 foot below ground surface (bgs)). |
| | | | | | 2 | | Sandy SILT with Gravel - brown and grey with minor orange mottling, dry, non-plastic, no petroleum odor, no sheen (0.5 to 4.0 feet bgs). |
| | 135 | 10:20 | 1.9 | - | 3 | | |
| | | | | | 4 | | |
| | | | | | 5 | | Sandy SILT - grey, slightly moist, non-plastic, few wood fragments between 8 and 11 feet bgs, no petroleum odor, no sheen (4 to 12.5 feet bgs). |
| | 136 | 10:25 | 2.9 | - | 6 | ML | |
| | | | | | 7 | | |
| | | | | | 8 | | |
| | | | | | 9 | | |
| | | | | | 10 | | |
| Bentonite Grout | 137 | 10:30 | 4.1 | - | 11 | | |
| | | | | | 12 | | |
| | | | | | 13 | SP | Silty SAND with Gravel - grey, slightly moist, no petroleum odor, no sheen (12.5 to 13 feet bgs). |
| | | | | | 14 | | Sandy SILT - grey, slightly moist, non-plastic, no petroleum odor, no sheen (13 to 16.0 feet bgs). |
| | 138 | 10:40 | 1.2 | - | 15 | ML | |
| | | | | | 16 | | |
| | | | | | 17 | | Silty SAND with Gravel - grey, moist, sand is fine grained, wood fragment at 17.5 feet bgs, brick fragments at 20 feet bgs, slight petroleum odor, no sheen (16 to 20.5 feet bgs). |
| | 139 | 10:45 | 2.8 | 196.8 | 18 | SM | |
| | | | | | 19 | | |
| | | | | | 20 | | |



SCOEPA00010295

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-1** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 10:15 | DRILL FINISH Time: 13:25 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | Date: 08/17/01 | Date: 08/17/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | DEPTH (feet) | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|
| Bentonite Grout | 140 | 11:00 | 22.1 | - | 21–24 | SM | SAND with Silt and Gravel - brown becoming grey below 26 feet bgs, moist, gravels are up to 2-inch diameter, several brick fragments, patchy dark grey discoloration below 26 feet bgs, no petroleum odor, no sheen (20.5 to 29 feet bgs). |
| | | | | | 25–26 | SP | |
| | 141 | 11:09 | 27.2 | - | 27–30 | | |
| | 142 | 11:20 | 66.2 | 25,300 | 31 | GM | Gravely SILT - olive grey, moist, no odor, no sheen, becoming black and tarry below 30 feet bgs, tar appears weathered (not elastic), plant debris is mixed with tar, very stiff, petroleum odor, sheen, base of tar is at 30 feet 10 inches bgs (30.5 to 31 feet bgs). |
| | | | | | 32 | ML | SILT - olive grey, moist, slightly plastic, several sandy layers, slight sheen, no petroleum odor (31 to 32 feet bgs). |
| | | | | | 33–35 | | Silty SAND - grey , wet, very fine grained, minor muscovite, petroleum odor and sheen in upper 2-inches of core only (36-39.0 feet bgs). |
| | 143 | 11:30 | 10.1 | - | 36–39 | SM | |
| | 144 | 11:45 | 7.1 | 101 | 40 | SP | SAND - grey, wet, fine grained, muscovite present, no petroleum odor, no sheen (39-42 feet bgs). |



SCOEPA00010296

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-1** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 10:15 | DRILL FINISH Time: 13:25 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | Date: 08/17/01 | Date: 08/17/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
| Bentonite Grout | 145 | 12:00 | 3.5 | - | | | 41<br>42<br>43<br>44<br>45 | | SP<br>ML<br>SP<br>ML | SILT - grey, slightly moist, stiff, non-plastic, minor shell fragments, no petroleum odor, no sheen (42 - 42.5 feet bgs).<br>SAND - grey with orange staining (oxidation), wet, fine grained, no petroleum odor, no sheen (42.5-44.5 feet bgs).<br>SILT - olive grey, moist, stiff, non-plastic, no petroleum odor, no sheen (44.5 - 45 feet bgs). |
| | 146 | 12:10 | 0.7 | - | | | 46<br>47<br>48<br>49<br>50 | | SP | SAND - grey, wet, fine grained, minor muscovite, woody material at 45 and 57 feet bgs, several thin (<2-inch) grey silt layers between 53 and 56 feet bgs, no petroleum odor, no sheen (45-64 feet bgs). |
| | 147 | 12:30 | 0.7 | - | | | 51<br>52<br>53<br>54<br>55 | | | |
| | 148 | 12:45 | 0.4 | - | | | 56<br>57<br>58 | | SP | |
| | 149 | 13:05 | 0.9 | - | | | 59<br>60 | | | |



SCOEPA00010297

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-1** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 10:15 | DRILL FINISH Time: 13:25 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | Date: 08/17/01 | Date: 08/17/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| BORING DIAMETER: | 1.5-inch |
|---|---|
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 61 | | | |
| | 150 | 13:25 | 0.6 | - | | | 62 | | SP | |
| | | | | | | | 63 | | | |
| | | | | | | | 64 | | | |
| | | | | | | | 65 | | | Boring terminated at 64.0 feet bgs. |
| | | | | | | | 66 | | | *Sample prefix is 5237-010817- |
| | | | | | | | 67 | | | |
| | | | | | | | 68 | | | |
| | | | | | | | 69 | | | |
| | | | | | | | 70 | | | |
| | | | | | | | 71 | | | |
| | | | | | | | 72 | | | |
| | | | | | | | 73 | | | |
| | | | | | | | 74 | | | |
| | | | | | | | 75 | | | |
| | | | | | | | 76 | | | |
| | | | | | | | 77 | | | |
| | | | | | | | 78 | | | |
| | | | | | | | 79 | | | |
| | | | | | | | 80 | | | |



SCOEPA00010298

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-2** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 8:45 Date: 08/14/01 | DRILL FINISH Time: 14:30 Date: 08/14/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | DEPTH (feet) | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|
| Bentonite Grout | 109 | 8:52 | 1.6 | - | 1 | SP | Surface: grass covered silty, SAND, brown with 1-inch thick zone of black coloration (organic?) at 6-inches bgs, dry, becoming gravelly at 2.5 feet bgs, no petroleum odor, no sheen (0 to 3 feet below ground surface (bgs)). |
| | | | | | 2 | | |
| | 110 | 8:53 | 2.2 | - | 3 | | SAND with Gravel - light brown, dry to slightly moist, fine-grained with minor Gravel (<1%), gravels are up to 1/4-inch diameter and are both rounded and angular, well graded, small piece of tar (fleck) at 4.25 feet bgs, no petroleum odor, slight sheen from tar fleck (3 to 4.25 feet bgs). |
| | | | | | 4 | | |
| | | | | | 5 | | |
| | | | | | 6 | | SAND with Gravel - as above, several brick fragments at 10.5 feet bgs, no petroleum odor, no sheen, no tar (4.25 to 11 feet bgs). |
| | 111 | 8:59 | 10.2 | - | 7 | | |
| | | | | | 8 | | |
| | | | | | 9 | | |
| | | | | | 10 | SP | |
| | | | | | 11 | | |
| | 112 | 9:02 | 2.7 | - | 12 | | SAND with Gravel - as above, small (1/8-inch diameter) dark grey to black zones of discoloration every few inches between 11 and 16 feet bgs, decreasing below, no petroleum odor, no sheen, no tar (11 to 21 feet bgs). |
| | | | | | 13 | | |
| | | | | | 14 | | |
| | 113 | 9:10 | 7.0 | 77.3 | 15 | | |
| | | | | | 16 | | |
| | | | | | 17 | | |
| | | | | | 18 | | |
| | 114 | 9:20 | 8.5 | - | 19 | | |
| | | | | | 20 | | |



SCOEPA00010299

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-2** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon | HAI LOGGER: | Rob Ede | DRILL START Time: 8:45 | DRILL FINISH Time: 14:30 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | Date: 08/14/01 | Date: 08/14/01 |
| PROJECT #: 5237 | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
| Bentonite Grout | 115 | 9:40 | 4.8 | 1,170 | | | 21<br>22<br>23<br>24<br>25 | | SP | SAND with Gravel - grey, moist, piece of cinder block or slag and brick fragments between 21 and 21.5 feet bgs, petroleum odor, no oil, no tar, no sheen (21 to 22.5 feet bgs).<br><br>SAND with Gravel - grey-green, moist, becoming wet at 28 feet bgs, no petroleum odor, no sheen (22.5 to 32 feet bgs). |
| | 116 | 9:55 | 8.6 | - | | | 26<br>27<br>28 | | | |
| | 117 | 10:10 | 6.6 | - | | | 29<br>30<br>31 | | | |
| | 118 | 10:36 | 7.2 | 414 | | | 32<br>33 | | | SAND with Gravel - grey to olive-grey, wet, mild to moderate petroleum odor, sheen, no oil or tar observed, brown glass fragment at base of sand, (30.5 to 32.5 feet bgs). |
| | | | | | | | 34 | | ML | Sandy SILT - olive grey to tan with orange mottling, moist, slightly plastic, clear glass fragment in upper 3-inches of silt, no petroleum odor, no sheen (32.5 to 34 feet bgs). |
| | | | | | | | 35 | | | Silty SAND - grey, wet, poorly graded, minor plant debris, no petroleum odor, no sheen (34-38 feet bgs). |
| | 119 | 10:40 | 6.3 | - | | | 36<br>37<br>38 | | SM | |
| | 120 | 10:46 | 7.4 | - | | | 39<br>40 | | SP | SAND - grey, becoming light brown below 40 feet bgs, wet, fine grained, poorly graded, muscovite present, no petroleum odor, no sheen (38-44 feet bgs). |

| BORING DIAMETER: | 1.5-inch |
|---|---|
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |



SCOEPA00010300

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-2** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 8:45 | DRILL FINISH Time: 14:30 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | Date: 08/14/01 | Date: 08/14/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | DEPTH (feet) | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|
| Bentonite Grout | 121 | 11:03 | 4.6 | - | 41–44 | SP | |
| | | | | | 45 | ML | SILT - light brown, slightly moist, stiff, slightly plastic, several small shell fragments, no petroleum odor, no sheen (44 - 45.5 feet bgs). |
| | | | | | 46–47 | SP | SAND - grey, wet, fine grained, no petroleum odor, no sheen (45.5-46.5 feet bgs). |
| | 122 | 11:21 | 7.8 | - | 48 | ML | Sandy SILT - tan, moist, slightly plastic, minor shell fragments, no petroleum odor, no sheen (46.5 - 48 feet bgs). |
| | | | | | 49 | SP | SAND - grey, wet, fine grained, no petroleum odor, no sheen (48-49 feet bgs). |
| | | | | | 50 | ML | SILT - grey, moist, several small shell fragments, no petroleum odor, no sheen (49 - 49.5 feet bgs). |
| | 123 | 11:40 | 7.0 | - | 51–52 | SP | SAND - grey, wet, fine grained, poorly graded, minor muscovite, no petroleum odor, no sheen (49.5-51.5 feet bgs). |
| | | | | | 53 | SM | Silty SAND - grey, wet, rootlets and minor plant debris, no petroleum odor, no sheen (51.5-53.5 feet bgs). |
| | | | | | 54–55 | SP | SAND - grey, wet, fine grained, poorly graded, minor muscovite, no shell fragments, no petroleum odor, no sheen (49.5-62.5 feet bgs). |
| | 124 | 11:58 | 4.1 | - | 56–58 | | |
| | 125 | 12:12 | 5.7 | - | 59–60 | | |



SCOEPA00010301

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-2** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 8:45 | DRILL FINISH Time: 14:30 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | Date: 08/14/01 | Date: 08/14/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 61 | | | |
| | | | | | | | 62 | | | |
| | 126 | 12:34 | 5.7 | - | | | 63 | | SM | Silty SAND - grey, very moist, no petroleum odor, no sheen (62.5-63.5 feet bgs). |
| | | | | | | | 64 | | | SAND - grey, wet, fine grained, poorly graded, no petroleum odor, no sheen (63.5-76 feet bgs). |
| | | | | | | | 65 | | | |
| | | | | | | | 66 | | SP | |
| | | | | | | | 67 | | | |
| | | | | | | | 68 | | | |
| | | | | | | | 69 | | | |
| | | | | | | | 70 | | | |
| | | | | | | | 71 | | | |
| | | | | | | | 72 | | | |
| | | | | | | | 73 | | | |
| | | | | | | | 74 | | | |
| | | | | | | | 75 | | | |
| | | | | | | | 76 | | | |
| | | | | | | | 77 | | SP | SAND - as above, no petroleum odor, no sheen (76-80 feet bgs). |
| | | | | | | | 78 | | | |
| | | | | | | | 79 | | | |
| | 127 | 13:24 | 3.9 | - | | | 80 | | | |



SCOEPA00010302

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-2** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 8:45 | DRILL FINISH Time: 14:30 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | Date: 08/14/01 | Date: 08/14/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| BORING DIAMETER: | 1.5-inch |
|---|---|
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 81 | | | |
| | | | | | | | 82 | | | |
| | | | | | | | 83 | | | |
| | | | | | | | 84 | | | |
| | | | | | | | 85 | | SP | |
| | | | | | | | 86 | | | |
| | | | | | | | 87 | | | SAND - as above, no petroleum odor, no sheen (86-90 feet bgs). |
| | | | | | | | 88 | | | |
| | 128 | 13:54 | 4.1 | - | | | 89 | | | |
| | | | | | | | 90 | | | |
| | | | | | | | 91 | | | |
| | | | | | | | 92 | | | |
| | | | | | | | 93 | | | |
| | | | | | | | 94 | | | |
| | | | | | | | 95 | | | |
| | | | | | | | 96 | | | |
| | | | | | | | 97 | | | SAND - as above, no petroleum odor; no sheen (96-98.5 feet bgs). |
| | | | | | | | 98 | | | |
| | 129 | 14:25 | 14.2 | - | | | 99 | | | Boring terminated at 100.0 feet bgs. |
| | | | | | | | 100 | | | *Sample prefix is 5237-010814- |



SCOEPA00010303

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-3** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 9:12 | DRILL FINISH Time: 16:20 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | Date: 08/20/01 | Date: 08/20/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | DEPTH (feet) | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | 1 | | Surface: grass covered silty, SAND with Gravel, light brown, dry, no petroleum odor, no sheen (0 to 1 foot below ground surface (bgs)). |
| | | | | | 2 | | |
| | | | | | 3 | SP | SAND with Gravel - light brown, dry, becoming slightly moist at 4 feet bgs, fine-grained with minor Gravel (<1%), gravels are up to 1/2-inch diameter and are both rounded and angular, well graded, thin (1/4-inch) silt layer at 5.5 feet bgs, no petroleum odor, no sheen (1 to 13 feet bgs). |
| | 151 | 9:16 | 2.5 | - | 4 | | |
| | | | | | 5 | | |
| | | | | | 6 | | |
| | 152 | 9:24 | 4.0 | 100 | 7 | | |
| | | | | | 8 | | |
| | | | | | 9 | | |
| | | | | | 10 | | |
| | | | | | 11 | | |
| | 153 | 9:29 | 3.6 | - | 12 | | |
| | | | | | 13 | | SAND with Gravel - 5-inch thick zone of grey discoloration with petroleum odor and slight to moderate sheen when wetted at 13 feet bgs, no oil or tar observed, a steel bolt is present within zone of impact (13 to 13.5 feet bgs). |
| | 154 | 9:45 | 8.8 | - | 14 | | |
| | | | | | 15 | SP | SAND with Gravel - light brown, dry, no sheen, no petroleum odor, no oil or tar observed (13.5 to 16.5 feet bgs). |
| | | | | | 16 | | |
| | | | | | 17 | | SAND with Gravel - grey discoloration with petroleum (creosote) odor and sheen when wetted, a 1/2-inch diameter rubber hose fragment is present at 16.5 feet bgs, no oil product or tar observed (16.5 to 18 feet bgs). |
| | 155 | 9:55 | 102 | 1,733 | 18 | | |
| | | | | | 19 | | SAND with Gravel - light brown with patchy zones of grey discoloration extending to 23.5 feet bgs, petroleum odor, no sheen, no oil or tar observed (18 to 23.5 feet bgs). |
| | | | | | 20 | | |



SCOEPA00010304

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-3** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 9:12<br>Date: 08/20/01 | DRILL FINISH Time: 16:20<br>Date: 08/20/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | 156 | 10:02 | 53.1 | - | | | 21, 22, 23, 24, 25 | | SP | SAND with Gravel - grey (natural?), dry, petroleum odor, no sheen, no oil or tar observed (23.5 to 30.5 feet bgs). |
| | 157 | 10:15 | 22.7 | - | | | 26, 27, 28, 29, 30 | | | |
| | 158 | 10:30 | 15 | - | | | 31, 32 | ▼ | | SAND with Gravel - grey, petroleum odor, slightly wet, sheen, no oil or tar observed (30.5 to 32.5 feet bgs). |
| | | | | | | | 33, 34, 35 | | ML | SILT - grey with tan mottling, moist to very moist, slightly plastic, rootlets, several sandy silt layers (3 to 4-inches thick) in 33 to 35 foot depth interval, no petroleum odor, no sheen (32.5 to 36 feet bgs). |
| | 159 | 10:45 | 12.5 | 106 | | | 36, 37, 38, 39 | | SM | Silty SAND - grey and light brown, wet, very fine grained, no petroleum odor, no sheen (36-40.5 feet bgs). |
| | 160 | 10:55 | 7.0 | - | | | 40 | | | |



SCOEPA00010305

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-3** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 9:12 | DRILL FINISH Time: 16:20 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | Date: 08/20/01 | Date: 08/20/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | DEPTH (feet) | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | 41 | SM | |
| | | | | | 42 | SP | SAND - grey, wet, very fine grained, muscovite present, no petroleum odor, no sheen (40.5-42 feet bgs). |
| | | | | | 43 | SM | Silty SAND - grey, moist, no sheen, no petroleum odor (42-43.5 feet bgs). |
| | 161 | 11:10 | - | - | 44 | ML | SILT - grey, slightly moist, stiff, non-plastic, rootlets, shell fragments, no petroleum odor, no sheen (43.5 - 44 feet bgs). |
| | | | | | 45 | SP | SAND - grey, wet, fine grained, poorly graded, woody material in upper sand zone, no petroleum odor, no sheen (44-48 feet bgs). |
| | | | | | 46 | | |
| | | | | | 47 | | |
| | 162 | 11:40 | 10.1 | - | 48 | | |
| | | | | | 49 | ML | Sandy SILT - grey, moist, stiff, non-plastic, no petroleum odor, no sheen (48 - 51 feet bgs). |
| | | | | | 50 | | |
| | | | | | 51 | | |
| | 163 | 11:45 | 9.3 | - | 52 | | SAND - grey, wet, fine grained, poorly graded, no petroleum odor, possible solvent odor (faint) from 59 feet to 64 feet bgs, no sheen (51-76 feet bgs). |
| | | | | | 53 | | |
| | | | | | 54 | | |
| | 164 | 12:02 | 10.7 | - | 55 | | |
| | | | | | 56 | SP | |
| | | | | | 57 | | |
| | | | | | 58 | | |
| | | | | | 59 | | |
| | - | 12:20 | 9.5 | - | 60 | | |



SCOEPA00010306

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-3** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 9:12 | DRILL FINISH Time: 16:20 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | Date: 08/20/01 | Date: 08/20/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | 165 | 12:45 | 9.2 | - | | | 61–64 | | SP | SAND - as above, no petroleum or solvent odor, no sheen (76-80 feet bgs). |
| | | | | | | | 65–70 | | | |
| | | | | | | | 71–75 | | | |
| | 166 | 13:30 | 9.0 | - | | | 76–80 | | SP | |



SCOEPA00010307

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-3** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: | DRILL FINISH Time: |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | 9:12 | 16:20 |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | Date: 08/20/01 | Date: 08/20/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 81 | | SP | NOTE: Soil Sampler (4-foot length) became stuck in hole (apparent sand heave / lock) during attempted push at 90 feet bgs. Sampler, with two feet of rod stem remain in hole. Pressure grouted hole with tremie tube from top of sampler (86 feet bgs) to ground surface.<br><br>Boring terminated at 90.0 feet bgs.<br><br>*Sample prefix is 5237-010820- |
| | | | | | | | 82 | | | |
| | | | | | | | 83 | | | |
| | | | | | | | 84 | | | |
| | | | | | | | 85 | | | |
| | | | | | | | 86 | | | |
| Soil Sampler | | | | | | | 87 | | | |
| | | | | | | | 88 | | | |
| | | | | | | | 89 | | | |
| | | | | | | | 90 | | | |
| | | | | | | | 91 | | | |
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| | | | | | | | 96 | | | |
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| | | | | | | | 98 | | | |
| | | | | | | | 99 | | | |
| | | | | | | | 100 | | | |



SCOEPA00010308

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-4** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 12:05 Date: 08/10/01 | DRILL FINISH Time: 16:00 Date: 08/10/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Chips | | | | | | | 1 | | | Surface: grass covered silty, SAND with Gravel, grey, dry, no hydrocarbon odor, no sheen (0 to 1 foot below ground surface (bgs)). |
| | | | | | | | 2 | | | |
| | 076 | 12:10 | 2.5 | - | | | 3 | | SP | SAND with Gravel - light brown, dry, becoming slightly moist at 4 feet bgs, fine-grained with minor Gravel (<1%), gravels are up to 1/2-inch diameter and are both rounded and angular, well graded, no petroleum odor, no sheen (1 to 10 feet bgs). |
| | | | | | | | 4 | | | |
| | | | | | | | 5 | | | |
| | | | | | | | 6 | | | |
| | 077 | 12:14 | 3.3 | - | | | 7 | | | |
| | | | | | | | 8 | | | |
| | | | | | | | 9 | | | |
| | | | | | | | 10 | | | |
| Bentonite Grout | 078 | 12:18 | 2.4 | - | | | 11 | | | SAND with Gravel - as above except with thin (1/4-inch) dark brown to grey colored layers at 10 feet bgs, 14 feet bgs, and 16 feet bgs, no petroleum odor, no sheen (10 to 18 feet bgs). |
| | | | | | | | 12 | | | |
| | | | | | | | 13 | | | |
| | | | | | | | 14 | | | |
| | 079 | 12:25 | 1.6 | 247.4 | | | 15 | | SP | |
| | | | | | | | 16 | | | |
| | | | | | | | 17 | | | |
| | 080 | 12:32 | 5.2 | 313 | | | 18 | | | SAND with Gravel - grey discoloration with petroleum (creosote) odor and sheen when wetted, no oil or tar present (18 to 20 feet bgs). |
| | | | | | | | 19 | | | |
| | | | | | | | 20 | | | |

| BORING DIAMETER: | 1.5-inch |
|---|---|
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |



SCOEPA00010309

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-4** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 12:05 Date: 08/10/01 | DRILL FINISH Time: 16:00 Date: 08/10/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | DEPTH (feet) | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | 21 | SP | SAND with Gravel - grey discoloration with petroleum (creosote) odor and sheen, slightly oily, but pores are not saturated with oil (20 to 24 feet bgs). |
| | no sample | 12:45 | 153 | - | 22 | | |
| | | | | | 23 | | |
| | | | | | 24 | | |
| | | | | | 25 | | SAND with Gravel - grey (natural?), slightly moist, slight petroleum odor, no sheen, no oil or tar observed (24 to 28 feet bgs). |
| | | | | | 26 | | |
| | 082 | 13:00 | 28.1 | - | 27 | | |
| | | | | | 28 | | |
| | | | | | 29 | | SAND - grey, wet, medium grained, no petroleum odor, no sheen, (28 to 29.5 feet bgs). |
| | | | | | 30 | SM | Silty SAND - grey, slightly moist, very fine grained, moderate petroleum odor, no sheen (29.5-32 feet bgs). |
| | 083 | 13:10 | 17.4 | - | 31 | | |
| | | | | | 32 | | |
| | | | | | 33 | ML | SILT - tan with orange mottling, moist, slightly plastic, no petroleum odor, no sheen (32 to 33 feet bgs). |
| | | | | | 34 | SM | Silty SAND - brown, wet, very fine grained, poorly graded, no petroleum odor, no sheen (33-35.5 feet bgs). |
| | | | | | 35 | | |
| | 084 | 13:25 | 8.5 | ND | 36 | | Sandy SILT - tan with orange mottling, moist, non-plastic, no petroleum odor, no sheen (35.5 - 39.5 feet bgs). |
| | | | | | 37 | ML | |
| | | | | | 38 | | |
| | 085 | 13:35 | 6.0 | - | 39 | | |
| | | | | | 40 | SP | SAND - grey, wet, very fine grained, no petroleum odor, no sheen (39.5-41 feet bgs). |



SCOEPA00010310

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-4** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 12:05 Date: 08/10/01 | DRILL FINISH Time: 16:00 Date: 08/10/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | DEPTH (feet) | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|
| Bentonite Grout | 086 | 13:50 | 3.7 | - | 41 | SP | Silty SAND - grey, moist, several small shell fragments, no sheen, no petroleum odor (41-41.5 feet bgs). |
| | | | | | 42 | SM | SAND - grey, wet, very fine grained, poorly graded, no petroleum odor, no sheen (41.5-42.5 feet bgs). |
| | | | | | 43 | SP | SILT - grey, moist, stiff, non-plastic, rootlets, shell fragments, no petroleum odor, no sheen (42.5 - 43 feet bgs). |
| | | | | | 44 | ML | SAND - grey, wet, fine grained, poorly graded, minor muscovite, 2-inch thick sandy silt layer at 53.5 feet bgs, no petroleum odor, no sheen (43-64 feet bgs). |
| | | | | | 45 | | |
| | | | | | 46 | | |
| | | | | | 47 | | |
| | 087 | 14:00 | 3.8 | - | 48 | | |
| | | | | | 49 | | |
| | | | | | 50 | | |
| | | | | | 51 | | |
| | 088 | 14:30 | 3.9 | - | 52 | | |
| | | | | | 53 | | |
| | | | | | 54 | | |
| | 089 | 15:05 | 3.0 | - | 55 | | |
| | | | | | 56 | | |
| | | | | | 57 | SP | |
| | | | | | 58 | | |
| | | | | | 59 | | |
| | | | | | 60 | | |



SCOEPA00010311

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-4** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon | HAI LOGGER: | Rob Ede | DRILL START Time: 12:05 Date: 08/10/01 | DRILL FINISH Time: 16:00 Date: 08/10/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | | |
| PROJECT #: 5237 | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| BORING DIAMETER: | 1.5-inch |
|---|---|
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | no sample | | | - | | | 61 | | SP | Boring terminated at 64.0 feet bgs.<br>*Sample prefix is 5237-010810- |
| | | | | | | | 62 | | | |
| | | | | | | | 63 | | | |
| | | | | | | | 64 | | | |
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SCOEPA00010312

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-5** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon | HAI LOGGER: | Rob Ede | DRILL START Time: 8:55 | DRILL FINISH Time: 17:00 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | Date: 08/13/01 | Date: 08/13/01 |
| PROJECT #: 5237 | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | DEPTH (feet) | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|
| Bentonite Chips | | | | | 1 | GP | Surface: asphalt with 6-inch gravel base (0 to 0.5 foot below ground surface (bgs)). |
| | | | | | 2 | | |
| | 090 | 9:10 | 1.2 | - | 3 | SP | SAND with Gravel - brown, dry, becoming slightly moist at 4 feet bgs, medium-grained with minor Gravel (<5%), gravels are up to 1.25-inch diameter and are both rounded and angular, well graded, no petroleum odor, no sheen (0.5 to 9.5 feet bgs). |
| | | | | | 4 | | |
| | | | | | 5 | | |
| | | | | | 6 | | |
| | 091 | 9:14 | 1.4 | ND | 7 | | |
| | | | | | 8 | | |
| | | | | | 9 | | |
| Bentonite Grout | 092 | 9:25 | 13.6 | 20,000 | 10 | | SAND with Gravel - as above except with thin (4-inch) grey discolred layer at 9.5 feet bgs, discolored area is sharply defined and has sheen and is oily, several brick and tar fragments within this zone (9.5 to 10 feet bgs). |
| | | | | | 11 | | |
| | | | | | 12 | | SAND with Gravel - brown, moist, medium grained sand, slight sheen, slight petroleum odor, no oil or tar (10 to 13 feet bgs). |
| | | | | | 13 | | |
| | | | | | 14 | | SAND with Gravel - brown, moist, medium grained sand, no sheen, no hydrocarbon odor, no oil or tar, thin (2-inches thick), dark grey layer with petroleum odor and slight sheen at 14 feet bgs (13 to 14 feet bgs). |
| | 093 | 9:35 | 2.4 | ND | 15 | SP | |
| | | | | | 16 | | SAND with Gravel - light grey, moist, medium grained sand, no sheen, no petroleum odor, no oil or tar (14 to 20 feet bgs). |
| | | | | | 17 | | |
| | | | | | 18 | | |
| | 094 | 9:40 | 2.1 | - | 19 | | |
| | | | | | 20 | | |



SCOEPA00010313

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-5** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: Rob Ede<br>SAMPLING METHOD: Stainless Steel Soil Sampler with PVC Sleeve<br>DRILLING METHOD: Hydraulic Push Soil Probe<br>EQUIPMENT TYPE Geo-Probe<br>DRILLER: Heriberto Ramirez<br>DRILLING CONTRACTOR: Geo-Tech Explorations, Inc. | DRILL START<br>Time:<br>8:55<br>Date:<br>08/13/01 | DRILL FINISH<br>Time:<br>17:00<br>Date:<br>08/13/01 |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 21 | | SP | SAND with Gravel - grey, moist, petroleum odor?, no sheen (20 to 22 feet bgs). |
| | 095 | 9:45 | 1.9 | - | | | 22 | | | |
| | | | | | | | 23 | | | Silty SAND - grey, slightly moist, very fine grained, no petroleum odor, no sheen (22-25.5 feet bgs). |
| | | | | | | | 24 | | | |
| | | | | | | | 25 | | | |
| | 096 | 9:58 | 1.6 | - | | | 26 | | | Silty SAND with Gravel- grey, moist to very moist, very fine grained sand, large gravels (>2-inch diameter) present at 26.5 feet bgs and at 32 feet bgs, much plant debris (roots, stalks) in 2-inch zone below 27.5 feet bgs, and between 28 and 32 feet bgs, no petroleum odor, no sheen (22-33 feet bgs). |
| | | | | | | | 27 | | | |
| | | | | | | | 28 | | SM | |
| | | | | | | | 29 | | | |
| | | | | | | | 30 | | | |
| Bentonite Grout | | | | | | | 31 | | | |
| | 097 | 10:03 | 1.8 | - | | | 32 | | | |
| | 098 | 10:14 | 2.0 | ND | | | 33 | | | |
| | | | | | | | 34 | | | SILT - tan with orange mottling, moist, slightly plastic, no petroleum odor, no sheen (33 to 36 feet bgs). |
| | | | | | | | 35 | | ML | |
| | 099 | 10:15 | 1.3 | - | | | 36 | | | |
| | | | | | | | 37 | | SM | Silty SAND - brown, wet, very fine grained, poorly graded, no petroleum odor, no sheen (36-37 feet bgs). |
| | | | | | | | 38 | | ML | SILT - olive grey with orange mottling, moist, non-plastic, several thin (<1-inch silty sand layers near 38 feet bgs, no petroleum odor, no sheen (37 - 40.5 feet bgs). |
| | | | | | | | 39 | | | |
| | 100 | 10:25 | 1.3 | - | | | 40 | | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |



SCOEPA00010314

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-5** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 8:55 | DRILL FINISH Time: 17:00 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | Date: 08/13/01 | Date: 08/13/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | DEPTH (feet) | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | 41 | ML<br>SP | SAND - grey, wet, fine grained, no petroleum odor, no sheen (40.5-41 feet bgs). |
| | | | | | 42 | | Silty SAND - grey, moist, becoming very moist to wet below 44 feet bgs, minor (<1%) small shell fragments, no sheen, no petroleum odor (41-46.5 feet bgs). |
| | | | | | 43 | SM | |
| | 101 | 10:36 | 1.9 | - | 44 | | |
| | | | | | 45 | | |
| | | | | | 46 | | |
| | 102 | 10:50 | 1.6 | - | 47 | | SILT - grey, moist,slightly plastic, minor small shell fragments, no petroleum odor, no sheen (46.5 - 49 feet bgs). |
| | | | | | 48 | ML | |
| | | | | | 49 | | |
| | | | | | 50 | SP | SAND - grey, wet, very fine grained, poorly graded, no petroleum odor, no sheen (49-49.5 feet bgs). |
| | | | | | | | Silty SAND - grey, moist, minor (<1%) small shell fragments, no sheen, no petroleum odor (49.5-52 feet bgs). |
| | 103 | 11:09 | 1.5 | - | 51 | SM | |
| | | | | | 52 | | |
| | | | | | 53 | | SAND - grey, wet, fine grained, poorly graded, minor muscovite, no petroleum odor, no sheen (52-59 feet bgs). |
| | | | | | 54 | | |
| | | | | | 55 | | |
| | | | | | 56 | | |
| | | | | | 57 | SP | |
| | | | | | 58 | | |
| | 104 | 11:55 | 2.9 | - | 59 | | SILT - grey, moist,slightly plastic, minor small shell fragments, no petroleum odor, no sheen (59 - 59.5 feet bgs). |
| | | | | | 60 | ML<br>SP | |



SCOEPA00010315

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-5** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon | HAI LOGGER: | Rob Ede | DRILL START Time: 8:55 | DRILL FINISH Time: 17:00 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | Date: 08/13/01 | Date: 08/13/01 |
| PROJECT #: 5237 | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| BORING DIAMETER: | 1.5-inch |
|---|---|
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 61 | | | SAND - grey, wet, fine grained, poorly graded, minor muscovite, thin (2-inch thick) silty sand layer at 78 feet bgs, no petroleum odor, no sheen (59.5-100 feet bgs). |
| | | | | | | | 62 | | | |
| | | | | | | | 63 | | | |
| | 105 | 12:15 | 2.5 | - | | | 64 | | | |
| | | | | | | | 65 | | | |
| | | | | | | | 66 | | | |
| | | | | | | | 67 | | | |
| | | | | | | | 68 | | SP | |
| | | | | | | | 69 | | | |
| | | | | | | | 70 | | | |
| | | | | | | | 71 | | | |
| | | | | | | | 72 | | | |
| | | | | | | | 73 | | | |
| | | | | | | | 74 | | | |
| | | | | | | | 75 | | | |
| | | | | | | | 76 | | | |
| | | | | | | | 77 | | | |
| | | | | | | | 78 | | | |
| | 106 | 15:15 | 2.9 | - | | | 79 | | | |
| | | | | | | | 80 | | | |



SCOEPA00010316

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-5** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: | DRILL FINISH Time: |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | 8:55 | 17:00 |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | Date: | Date: |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | 08/13/01 | 08/13/01 |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Heaved Formation Sand | 107 | 13:45 | 2.3 | - | | | 81 | | SP | Boring terminated at 100.0 feet bgs.<br>*Sample prefix is 5237-010813-<br>NOTE: Formation Sand heaved into borehole and tremie tube to 80 feet bgs, preventing the placement of grout across this depth interval |
| | 108 | 14:25 | 2.4 | - | | | 100 | | | |



SCOEPA00010317

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-6** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 9:15 | DRILL FINISH Time: 14:00 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | Date: 08/02/01 | Date: 08/02/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | DEPTH (feet) | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|
| Bentonite Chips | | | | | 1 | GP | Surface: asphalt with 6-inch gravel base (0 to 0.5 foot below ground surface (bgs)). |
| | 01 | 9:21 | 1.6 | - | 2 | SP | SAND - light brown with some orange oxidation, slightly moist, medium-grained, loose, no petroleum odor, no sheen (0.5 to 4 feet bgs). |
| | | | | | 3 | | |
| | | | | | 4 | | |
| | | | | | 5 | | SAND with Gravel - light brown and grey, slightly moist, fine-grained, minor gravel (up to 1/2-inch diameter), no petroleum odor, no sheen (4 to 6.5 feet bgs). |
| Bentonite Grout | 02 | 9:28 | 1.9 | - | 6 | | |
| | | | | | 7 | SM | Silty SAND - olive grey, slightly moist, reducing odor (organic), several coal-like and concrete fragments, no petroleum odor, no sheen (6.5-8 feet bgs). |
| | | | | | 8 | | |
| | 03 | 9:32 | 2.2 | - | 9 | | Silty SAND with Gravel - grey, moist, piece of concrete encountered at 10 feet bgs, no petroleum odor, no sheen (8 to 10 feet bgs). |
| | | | | | 10 | | |
| | 04 | 9:35 | 2.2 | 247.4 | 11 | SP | Silty SAND with Gravel - brown and black, moist, coarse grained sand, slight petroleum odor?, no sheen (10 - 12 feet bgs). |
| | | | | | 12 | | |
| | | | | | 13 | | Silty SAND with Gravel - brown, moist, coarse grained sand, refusal at 15.5 feet bgs on concrete, thin wet zone immediately above concrete, no petroleum odor, no sheen (12 - 16 feet bgs). |
| | | | | | 14 | | |
| | | | | | 15 | | |
| | | | | | 16 | concrete | |
| | 05 | 10:00 | 1.8 | - | 17 | SP | SAND - light grey, wet, medium grained sand, slight sheen, no hydrocarbon odor, no oil or tar (14 to 20 feet bgs). |
| | | | | | 18 | | Silty SAND with Gravel - grey, very moist, woody debris and brick fragments throughout, large, angular basalt fragment at 18 feet bgs, burned wood fragments at 19 feet bgs, no petroleum odor, no sheen (16.5-20 feet bgs). |
| | | | | | 19 | SM | |
| | 06 | 10:03 | 1.6 | - | 20 | | |



SCOEPA00010318

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-6** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 9:15 | DRILL FINISH Time: 14:00 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | Date: 08/02/01 | Date: 08/02/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | DEPTH (feet) | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | 21 | SP | SAND with Gravel - grey, wet, medium grained, no petroleum odor, possible sheen (20 to 23.5 feet bgs). |
| | | | | | 22 | | |
| | 07 | 10:10 | 2.1 | ND | 23 | | |
| | | | | | 24 | GP | Sandy GRAVEL - grey, wet, well rounded gravels, no petroleum odor, no sheen (23.5-24 feet bgs). |
| | | | | | 25 | ML | SILT - olive grey with minor brown and orange mottling near base, moist, non-plastic, rootlets, no petroleum odor, no sheen (24 to 26 feet bgs). |
| | | | | | 26 | | |
| | 08 | 10:20 | 2.2 | - | 27 | SM | Silty SAND - olive grey, wet, very fine grained, poorly graded, no petroleum odor, no sheen (26-26.5 feet bgs). |
| | | | | | 28 | ML | SILT - grey with orange mottling, very moist, slightly plastic, several very thin (<1/4-inch thick) fine-grained sand layers. no petroleum odor, no sheen (26.5 to 32 feet bgs). |
| | | | | | 29 | | |
| | 09 | 10:35 | 2.2 | - | 30 | | |
| | | | | | 31 | | |
| | | | | | 32 | | |
| | 10 | 10:55 | 2.4 | - | 33 | SP | SAND - brown, wet, fine grained, minor muscovite, poorly graded, several thin (< 1-inch) silt layers below 36 feet bgs, no petroleum odor, no sheen (32-37.5 feet bgs). |
| | | | | | 34 | | |
| | | | | | 35 | | |
| | | | | | 36 | | |
| | | | | | 37 | | |
| | 11 | 11:05 | 1.8 | - | 38 | SM | Silty SAND - grey and brown, wet, fine-grained, no sheen, no petroleum odor (37.5-40 feet bgs). |
| | | | | | 39 | | |
| | | | | | 40 | | |



SCOEPA00010319

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-6** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 9:15 | DRILL FINISH Time: 14:00 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | Date: 08/02/01 | Date: 08/02/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 41 | | SP | SAND - brown, wet, fine grained, several small shell fragments at 43 feet bgs, no petroleum odor, no sheen (40-44 feet bgs). |
| | 12 | 11:25 | 2.5 | - | | | 42 | | | |
| | | | | | | | 43 | | | |
| | | | | | | | 44 | | | |
| | | | | | | | 45 | | | SAND - grey, wet, several thin (< 1-inch thick) silt layers every 1 to 2 feet, minor muscovite, minor shell fragments at 54 feet bgs, no petroleum odor, no sheen (44-59 feet bgs). |
| | | | | | | | 46 | | | |
| | 13 | 11:50 | 2.8 | - | | | 47 | | | |
| | | | | | | | 48 | | | |
| | | | | | | | 49 | | | |
| | | | | | | | 50 | | | |
| | 14 | 12:20 | 1.5 | - | | | 51 | | | |
| | | | | | | | 52 | | | |
| | | | | | | | 53 | | | |
| | 15 | 12:50 | 2.6 | - | | | 54 | | | |
| | | | | | | | 55 | | | |
| | | | | | | | 56 | | SP | |
| | | | | | | | 57 | | | |
| | | | | | | | 58 | | | |
| | 16 | 13:00 | - | - | | | 59 | | | |
| | | | | | | | 60 | | ML<br>SP | SILT - grey, moist,slightly plastic, minor small shell fragments, no petroleum odor, no sheen (59 - 59.5 feet bgs). |



SCOEPA00010320

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-6** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 9:15 Date: 08/02/01 | DRILL FINISH Time: 14:00 Date: 08/02/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| BORING DIAMETER: | 1.5-inch |
|---|---|
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 61 | | SP | SAND - grey, wet, fine grained, poorly graded, no petroleum odor, no sheen (59.5-64 feet bgs). |
| | | | | | | | 62 | | | |
| | | | | | | | 63 | | | |
| | | | | | | | 64 | | | |
| | | | | | | | 65 | | | Boring terminated at 64.0 feet bgs. |
| | | | | | | | 66 | | | *Sample prefix is 5237-010802- |
| | | | | | | | 67 | | | |
| | | | | | | | 68 | | | |
| | | | | | | | 69 | | | |
| | | | | | | | 70 | | | |
| | | | | | | | 71 | | | |
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| | | | | | | | 75 | | | |
| | | | | | | | 76 | | | |
| | | | | | | | 77 | | | |
| | | | | | | | 78 | | | |
| | | | | | | | 79 | | | |
| | | | | | | | 80 | | | |



SCOEPA00010321

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-7** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 8:45 | DRILL FINISH Time: 13:30 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | Date: 08/08/01 | Date: 08/08/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | DEPTH (feet) | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|
| Bentonite Chips | | | | | 1 | SM | Surface: grass covered silty SAND, brown, dry, no hydrocarbon odor, no sheen (0 to 2.5 feet below ground surface (bgs)). |
| | | | | | 2 | | |
| | 059 | 8:50 | 3.4 | - | 3 | | SAND - brown, dry, medium-grained, loose, no petroleum odor, no sheen (2.5 to 4.5 feet bgs). |
| | | | | | 4 | SP | |
| | | | | | 5 | ML | Sandy SILT - grey, moist, plant debris wan wood fragments, no petroleum odor, no sheen (4.5 to 6.5 feet bgs). |
| | | | | | 6 | | |
| | 060 | 9:00 | 4.1 | - | 7 | GP | Sandy GRAVEL with concrete - grey, moist to wet immediately above concrete, no petroleum odor, no sheen (6.5 to 7 feet bgs). |
| | | | | | 8 | SP | SAND with Gravel - grey, moist, medium grained sand, gravels (<5%) are up to 1/4-inch diameter, no petroleum odor, no sheen (7 - 12.5 feet bgs). |
| | | | | | 9 | | |
| | | | | | 10 | | |
| | | | | | 11 | | |
| | 061 | 9:10 | 6.1 | - | 12 | | |
| | | | | | 13 | | Sandy SILT - grey, moist, non-plastic, plant debris and wood fragments at 13 feet bgs, minor plant matterfrom 13 to 14 feet bgs, rounded gravel (up to 1/2-inch diameter) below 13 feet bgs, no petroleum odor, no sheen (12.5 to 20 feet bgs). |
| | 062 | 9:15 | 8.5 | - | 14 | | |
| | | | | | 15 | | |
| Bentonite Grout | | | | | 16 | ML | |
| | | | | | 17 | | |
| | 063 | 9:20 | 16.0 | - | 18 | | |
| | | | | | 19 | | |
| | | | | | 20 | | |



SCOEPA00010322

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-7** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 8:45<br>Date: 08/08/01 | DRILL FINISH Time: 13:30<br>Date: 08/08/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | DEPTH (feet) | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | 21 | SM | Silty SAND - grey, moist, no petroleum odor, no sheen (20 to 22.5 feet bgs). |
| | | | | | 22 | | |
| | 064/065 | 9:30 | 56.5 | 11,420 | 23 | | Sandy Silty GRAVEL - brown to grey, petroleum odor (diesel?), sheen, several small patches of oil (22.5-24 feet bgs). |
| | | | | | 24 | GM | |
| | | | | | 25 | | Sandy Silty GRAVEL - as above, slight petroleum odor, slight sheen, no oil (24-25 feet bgs). |
| | 066 | 9:38 | 6.9 | - | 26 | | SILT - tan with orange mottling, moist, becoming very moist below 28 feet bgs, slightly plastic, stiff, no petroleum odor, no sheen (25 to 32 feet bgs). |
| | | | | | 27 | | |
| | | | | | 28 | | |
| | 067 | 9:42 | 7.8 | - | 29 | | |
| | | | | | 30 | | |
| | | | | | 31 | | |
| | | | | | 32 | ML | |
| | | | | | 33 | | Sandy SILT - grey with orange mottling, very moist to slightly wet, non-plastic, no sheen, no petroleum odor (32-36.5 feet bgs). |
| | 068 | 9:55 | 4.7 | - | 34 | | |
| | | | | | 35 | | |
| | | | | | 36 | | |
| | | | | | 37 | | |
| | 069 | 10:10 | 3.4 | - | 38 | | Sandy SILT - grey, moist, slightly-plastic, minor rootlets, no sheen, no petroleum odor (36.5-42 feet bgs). |
| | | | | | 39 | | |
| | | | | | 40 | | |



SCOEPA00010323

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-7** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon | HAI LOGGER: | Rob Ede | DRILL START Time: 8:45 | DRILL FINISH Time: 13:30 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | Date: 08/08/01 | Date: 08/08/01 |
| PROJECT #: 5237 | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| BORING DIAMETER: | 1.5-inch |
|---|---|
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 41 | | ML | SAND - brown, wet, fine grained, several small shell fragments at 43 feet bgs, no petroleum odor, no sheen (40-44 feet bgs). |
| | | | | | | | 42 | | | |
| | 070 | 10:45 | 3.4 | - | | | 43 | | | SILT - grey, moist, non-plastic, stiff, rootlets, minor shell fragments, no petroleum odor, no sheen (44-49 feet bgs). |
| | | | | | | | 44 | | | |
| | | | | | | | 45 | | | |
| | | | | | | | 46 | | | |
| | | | | | | | 47 | | | |
| | 071 | 11:00 | 3.5 | - | | | 48 | | | |
| | | | | | | | 49 | | | |
| | | | | | | | 50 | | SM | Silty SAND - olive grey, wet, fine grained, no petroleum odor, no sheen (49 to 52 feet bgs). |
| | | | | | | | 51 | | | |
| | 072 | 11:18 | 3.7 | - | | | 52 | | | |
| | | | | | | | 53 | | SP | SAND - grey, wet, medium grained, poorly graded, no petroleum odor, no sheen (52-53 feet bgs). |
| | | | | | | | 54 | | SM | Silty SAND - olive grey, moist, fine grained, no petroleum odor, no sheen (53 to 53.5 feet bgs). |
| | | | | | | | 55 | | SP | SAND - grey, wet, fine grained, poorly graded, minor muscovite, no petroleum odor, no sheen (53.6-56 feet bgs). |
| | 073 | 11:45 | 3.8 | - | | | 56 | | | |
| | | | | | | | 57 | | ML | Sandy SILT - grey, moist to wet, no petroleum odor, no sheen (56 - 56.5 feet bgs). |
| | | | | | | | 58 | | SM | Silty SAND - grey, moist to wet, no petroleum odor, no sheen (56.5 - 57.5 feet bgs). |
| | 074 | 13:00 | 4.3 | - | | | 59 | | SP | SAND - grey, wet, fine grained, poorly graded, no petroleum odor, no sheen (57.5-60 feet bgs). |
| | | | | | | | 60 | | | |



SCOEPA00010324

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-7** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 8:45 | DRILL FINISH Time: 13:30 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | Date: 08/08/01 | Date: 08/08/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
| Bentonite Grout | | | | | | | 61 | | SM | Silty SAND - grey, wet, very fine grained, poorly graded, no petroleum odor, no sheen (60 to 63 feet bgs). |
| | | | | | | | 62 | | | |
| | | | | | | | 63 | | | |
| | 075 | 13:20 | 5.0 | - | | | 64 | | SP | SAND - grey, wet, fine grained, poorly graded, no petroleum odor, no sheen (63-64 feet bgs). |
| | | | | | | | 65 | | | Boring terminated at 64.0 feet bgs. |
| | | | | | | | 66 | | | *Sample prefix is 5237-010802- |
| | | | | | | | 67 | | | |
| | | | | | | | 68 | | | |
| | | | | | | | 69 | | | |
| | | | | | | | 70 | | | |
| | | | | | | | 71 | | | |
| | | | | | | | 72 | | | |
| | | | | | | | 73 | | | |
| | | | | | | | 74 | | | |
| | | | | | | | 75 | | | |
| | | | | | | | 76 | | | |
| | | | | | | | 77 | | | |
| | | | | | | | 78 | | | |
| | | | | | | | 79 | | | |
| | | | | | | | 80 | | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |



SCOEPA00010325

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-8** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: | DRILL FINISH Time: |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | 8:30 | 18:30 |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | Date: | Date: |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | 08/06/01 | 08/07/01 |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| BentoniteChips | | | | | | | 1 | | SM | Surface: grass covered silty SAND, brown, dry, slight petroleum odor at 2 feet bgs?, no sheen (0 to 2 feet below ground surface (bgs)). |
| | | | | | | | 2 | | | |
| | 031 | 8:40 | 1.0 | | | | 3 | | | SAND with Gravel - brown, slightly moist, fine-grained, minor (<1%) rounded gravel (up to 1/2-inch diameter), 6-inch diameter log at 12.5 bgs, underlain by 1-inch diameter angular basalt fragment, no petroleum odor, no sheen (2 to 12.5 feet bgs). |
| | | | | | | | 4 | | | |
| | | | | | | | 5 | | | |
| | 032 | 8:45 | 0.8 | | | | 6 | | | |
| | | | | | | | 7 | | SP | |
| | | | | | | | 8 | | | |
| | | | | | | | 9 | | | |
| | 033 | 8:50 | 1.6 | | | | 10 | | | |
| | | | | | | | 11 | | | |
| | | | | | | | 12 | | | |
| | | | | | | | 13 | | ML | SILT - brown, moist, no petroleum odor, no sheen (12.5 to 13.5 feet bgs). |
| | | | | | | | 14 | | | SAND - grey, moist, fine-grained, no petroleum odor, no sheen (13.5 to 17 feet bgs). |
| | | | | | | | 15 | | | |
| | | | | | | | 16 | | SP | |
| | 034 | 8:58 | 2.2 | | | | 17 | | | |
| | | | | | | | 18 | | ML | SILT - olive grey, slightly moist, several thin (<1-inch) very fine grained sand layers, no petroleum odor, no sheen (17 to 23.5 feet bgs). |
| | | | | | | | 19 | | | |
| | | | | | | | 20 | | | |



SCOEPA00010326

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-8** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 8:30 | DRILL FINISH Time: 18:30 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | Date: 08/06/01 | Date: 08/07/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | 035 | 9:00 | 2.2 | | | | 21 | | ML | |
| | | | | | | | 22 | | | |
| | | | | | | | 23 | | | |
| | | | | | | | 24 | | SP | SAND - grey, moist, fine-grained, no petroleum odor, no sheen (23.5 to 24 feet bgs). |
| | | | | | | | 25 | | SM | Silty SAND - grey, very moist, no petroleum odor, no sheen (24 to 24.5 feet bgs). |
| | 036 | 9:10 | 2.6 | | | | 26 | | | SAND with Gravel - brown becoming grey below 25 feet bgs, moist becoming wet below 28.5 feet bgs, medium-grained, wood fragments, no petroleum odor, no sheen (24.5 to 31.5 feet bgs). |
| | | | | | | | 27 | | | |
| | | | | | | | 28 | | SP | |
| | | | | | | | 29 | | | |
| | | | | | | | 30 | | | |
| | 037 | 9:15 | 2.4 | | | | 31 | | | Silty SAND - grey, wet, minor wood fragments, slight sheen, slight reducing odor (31.5-36 feet bgs). |
| | | | | | | | 32 | | | |
| | | | | | | | 33 | | | |
| | | | | | | | 34 | | | |
| | 038 | 9:30 | 1.8 | | | | 35 | | | |
| | | | | | | | 36 | | SM | Silty SAND - brown, wet, minor plant matter, thin layers (<3-inches thick) of very fine-grained sand at 41.5 feet bgs and 43 feet bgs, no sheen, no petroleum odor (36-45 feet bgs). |
| | | | | | | | 37 | | | |
| | | | | | | | 38 | | | |
| | | | | | | | 39 | | | |
| | | | | | | | 40 | | | |



SCOEPA00010327

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-8** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 8:30 | DRILL FINISH Time: 18:30 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | Date: 08/06/01 | Date: 08/07/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 41 | | SM | |
| | | | | | | | 42 | | | |
| | 039 | 10:20 | 2.9 | | | | 43 | | | |
| | | | | | | | 44 | | | |
| | | | | | | | 45 | | | |
| | | | | | | | 46 | | SP | SAND - brown, wet, very fine grained, no petroleum odor, no sheen (45-46.5 feet bgs). |
| | 040 | 10:45 | 2.6 | | | | 47 | | ML | Sandy SILT - brown, moist, non-plastic, no petroleum odor, no sheen (46.5 to 47.5 feet bgs). |
| | | | | | | | 48 | | SM | Silty SAND - brown, moist, no petroleum odor, no sheen (47.5 to 48 feet bgs). |
| | | | | | | | 49 | | | SAND - brown, wet, fine-grained, poorly graded, minor muscovite, no petroleum odor, no sheen (48-55 feet bgs). |
| | | | | | | | 50 | | | |
| Probe Rod | 041 | 11:05 | 2.9 | | | | 51 | | | |
| | | | | | | | 52 | | | |
| | | | | | | | 53 | | SP | |
| | | | | | | | 54 | | | |
| | | | | | | | 55 | | | |
| | 042 | 11:30 | 2.7 | | | | 56 | | | SAND - as above, medium-grained, no petroleum odor, no sheen (48-59 feet bgs). |
| | | | | | | | 57 | | | |
| | | | | | | | 58 | | | |
| Bentonite Grout | 043 | 12:35 | 2.1 | | | | 59 | | | |
| | | | | | | | 60 | | | SAND - as above, fine-grained, no petroleum odor, no sheen (59-63.5 feet bgs). |



SCOEPA00010328

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-8** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 8:30 | DRILL FINISH Time: 18:30 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | Date: 08/06/01 | Date: 08/07/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 61 | | SP | |
| | | | | | | | 62 | | | |
| | | | | | | | 63 | | | |
| | 044 | 13:12 | 1.8 | | | | 64 | | ML | Sandy SILT - brown, moist, non-plastic, brown, fine-grained sand in botton of sampler, no petroleum odor, no sheen (63.5-64 feet bgs). |
| | | | | | | | 65 | | | |
| | | | | | | | 66 | | | |
| | | | | | | | 67 | | | |
| | | | | | | | 68 | | | |
| | | | | | | | 69 | | | |
| | | | | | | | 70 | | | |
| | | | | | | | 71 | | | |
| | | | | | | | 72 | | SP | |
| | | | | | | | 73 | | | |
| | | | | | | | 74 | | | |
| | | | | | | | 75 | | | |
| | | | | | | | 76 | | | NOTE: At 13:45 try releasing pin for soil sampler. Pin will not release so trip out of hole, clean sampler, and back down hole for 76 to 80 foot sample at 14:10. No sample recovery at 76 to 80 feet bgs. Driller indicates likely presence of dense sands (a lot of hammering needed to advance soil sampler). |
| | | | | | | | 77 | | | |
| | | | | | | | 78 | | | |
| | | | | | | | 79 | | | |
| Probe Rod | | | | | | | 80 | | | |



SCOEPA00010329

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-8** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 8:30<br>Date: 08/06/01 | DRILL FINISH Time: 18:30<br>Date: 08/07/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 81 | | |
| | | | | | | | 82 | | |
| Soil Sampler | | | | | | | 83 | | SP |
| | | | | | | | 84 | | |
| | | | | | | | 85 | | |
| | | | | | | | 86 | | |
| | | | | | | | 87 | | bedrock? |
| | | | | | | | 88 | | |
| | | | | | | | 89 | | |
| | | | | | | | 90 | | |
| | | | | | | | 91 | | |
| | | | | | | | 92 | | |
| | | | | | | | 93 | | |
| | | | | | | | 94 | | |
| | | | | | | | 95 | | |
| | | | | | | | 96 | | |
| | | | | | | | 97 | | |
| | | | | | | | 98 | | |
| | | | | | | | 99 | | |
| | | | | | | | 100 | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

SOIL DESCRIPTION

NOTE: At 15:40 8/6/01 had refusal at 86 feet bgs on very hard surface (bedrock?). Hammering caused threads on probe rod to shear and pulled the probe eqipment out of the tracking. Probe rig to shop for maintenance.

8/7/01 8:35 Recovered all but the lower 32 feet of probe rod and the 4-foot soil sampler from the bore hole. Soil sampler (4-foot length) and rod are stuck at base of hole. Cannot fish out. Pressure grouted hole with tremie tube from top of sampler (82 feet bgs) to 20 feet bgs, placed bentonite chips from top of grout seal (20 feet bgs) to ground surface.

Boring terminated at 86.0 feet bgs.

*Sample prefix is 5237-010806-



SCOEPA00010330

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-9** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 9:45 | DRILL FINISH Time: 15:20 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | Date: 08/07/01 | Date: 08/07/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1 | | GP | Surface: asphalt with 6-inch gravel base (0 to 0.5 foot below ground surface (bgs)). |
| | 145 | 9:55 | 0.6 | - | | | 2 | | | SAND with Gravel - brown, dry, fine-grained, minor (<1%) rounded and angular gravel (up to 1-inch diameter), minor rootlets from 4 to 8 feet bgs, no petroleum odor, no sheen (0.5 to 8 feet bgs). |
| | | | | | | | 3 | | | |
| | | | | | | | 4 | | | |
| BentoniteChips | | | | | | | 5 | | | |
| | | | | | | | 6 | | | |
| | 046 | 9:58 | 0.7 | - | | | 7 | | | |
| | | | | | | | 8 | | | |
| | | | | | | | 9 | | | SAND with Gravel - brown, slightly moist, fine-grained, minor (<1%) rounded and angular gravel (up to 2-inch diameter),no petroleum odor, slight sheen (8 to 12 feet bgs). |
| | | | | | | | 10 | | SP | |
| | 047 | 10:03 | 0.8 | - | | | 11 | | | |
| | | | | | | | 12 | | | |
| | | | | | | | 13 | | | SAND with Gravel - as above,becoming fully moist at 18 feet bgs, no petroleum odor, no sheen (12 to 21 feet bgs). |
| | | | | | | | 14 | | | |
| | 048 | 10:06 | 1.1 | - | | | 15 | | | |
| | | | | | | | 16 | | | |
| | | | | | | | 17 | | | |
| | | | | | | | 18 | | | |
| | 049 | 10:15 | 1.2 | - | | | 19 | | | |
| | | | | | | | 20 | | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |



SCOEPA00010331

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-9** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon | HAI LOGGER: | Rob Ede | DRILL START Time: 9:45 | DRILL FINISH Time: 15:20 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | Date: 08/07/01 | Date: 08/07/01 |
| PROJECT #: 5237 | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | DEPTH (feet) | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|
| Bentonite Grout | 050 | 10:25 | 1.5 | ND | 21–22 | SP / GM | Sandy Silty GRAVEL - grey, moist, slight sheen, no petroleum odor (21-22.5 feet bgs). |
| | | | | | 23 | SP | SAND - grey, moist, fine-grained, wood fragments, no petroleum odor, no sheen (22.5 to 24 feet bgs). |
| | | | | | 24–25 | ML / SP | Sandy SILT - grey, moist, no petroleum odor, no sheen (24 to 24.5 feet bgs).<br>SAND - grey, moist, fine-grained, no petroleum odor, no sheen (24.5 to 25.5 feet bgs). |
| | 051 | 10:35 | 1.5 | - | 26–28 | SM | Silty SAND - grey, moist, minor shell fragments, no petroleum odor, no sheen (25.5-28 feet bgs). |
| | | | | | 29–30 | ML / SP / ML | SILT - olive grey, moist, non-plastic, minor plant matter, no petroleum odor, no sheen (28-28.5 feet bgs).<br>SAND - grey, very moist, fine-grained, woody matter and shell fragments, no petroleum odor, no sheen (28.5 to 29 feet bgs).<br>SILT - olive grey, moist, non-plastic, minor plant matter, no petroleum odor, no sheen (29-30.5 feet bgs). |
| | 052 | 11:05 | 1.6 | - | 31–34 | SP | SAND - grey, wet, fine-grained, no petroleum odor, no sheen (30.5 to 34.5 feet bgs). |
| | 053 | 11:15 | 1.2 | - | 35–36 | ML | SILT - olive grey, very moist, slightly plastic, no petroleum odor, no sheen (34.5-36 feet bgs). |
| | | | | | 37–38 | SP | SAND - grey, wet, fine-grained, several thin (<2-inches thick) silt layers, several 1-inch diameter gravels from 40 to 42 feet bgs, no petroleum odor, no sheen (36 to 42 feet bgs). |
| | 054 | 11:45 | 1.5 | - | 39–40 | | |



SCOEPA00010332

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-9** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 9:45 | DRILL FINISH Time: 15:20 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | Date: 08/07/01 | Date: 08/07/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 41 | | SP | |
| | 055 | 12:15 | 1.7 | - | | | 42 | | | Silty SAND - tan, wet, very fine-grained, minor muscovite, no sheen, no petroleum odor (42-50.5 feet bgs). |
| | | | | | | | 43 | | | |
| | | | | | | | 44 | | | Note: Driller accidentally pushed through the 44 to 48 feet bgs depth interval without collecting a soil sample. |
| | | | | | | | 45 | | | |
| | | | | | | | 46 | | SM | |
| | | | | | | | 47 | | | |
| | | | | | | | 48 | | | |
| | 056 | 13:30 | 1.3 | - | | | 49 | | | |
| | | | | | | | 50 | | | |
| | | | | | | | 51 | | | SAND - brown, moist, fine-grained, poorly graded, minor muscovite, no petroleum odor, no sheen (50.5-53 feet bgs). |
| | | | | | | | 52 | | | |
| | | | | | | | 53 | | SP | |
| | 057 | 14:00 | 1.5 | - | | | 54 | | | SAND - grey, wet, fine-grained, poorly graded, minor muscovite, woody material present, no petroleum odor, no sheen (53-56 feet bgs). |
| | | | | | | | 55 | | | |
| | | | | | | | 56 | | | |
| | | | | | | | 57 | | | Silty SAND - brown, very moist to wet, very fine-grained, no petroleum odor, no sheen (56-61 feet bgs). |
| | | | | | | | 58 | | | |
| | | | | | | | 59 | | SM | |
| | | | | | | | 60 | | | |



SCOEPA00010333

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-9** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 9:45 | DRILL FINISH Time: 15:20 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | Date: 08/07/01 | Date: 08/07/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 61 | | SM | SAND - brown, wet, fine-grained, poorly graded, no petroleum odor, no sheen (53-56 feet bgs). |
| | | | | | | | 62 | | | |
| | 058 | 15:00 | 1.4 | - | | | 63 | | SP | |
| | | | | | | | 64 | | | |
| | | | | | | | 65 | | | Boring terminated at 64.0 feet bgs. |
| | | | | | | | 66 | | | *Sample prefix is 5237-010807- |
| | | | | | | | 67 | | | |
| | | | | | | | 68 | | | |
| | | | | | | | 69 | | | |
| | | | | | | | 70 | | | |
| | | | | | | | 71 | | | |
| | | | | | | | 72 | | | |
| | | | | | | | 73 | | | |
| | | | | | | | 74 | | | |
| | | | | | | | 75 | | | |
| | | | | | | | 76 | | | |
| | | | | | | | 77 | | | |
| | | | | | | | 78 | | | |
| | | | | | | | 79 | | | |
| | | | | | | | 80 | | | |



SCOEPA00010334

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-10** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 11:35 Date: 08/03/01 | DRILL FINISH Time: 15:00 Date: 08/03/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | DEPTH (feet) | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|
| Bentonite Chips | | | | | 1 | GP | Surface: grass covered silty SAND with Gravel, brown, dry, no petroleum odor, no sheen (0 to 5 feet below ground surface (bgs)). |
| | | | | | 2 | | |
| | 017 | 11:40 | 2.0 | - | 3 | SM | SAND with Gravel - brown, dry, fine-grained, minor (<1%) rounded and angular gravel (up to 1-inch diameter), minor rootlets from 4 to 8 feet bgs, no petroleum odor, no sheen (0.5 to 8 feet bgs). |
| | | | | | 4 | | |
| | | | | | 5 | | |
| | | | | | 6 | | SAND - brown and grey, slightly moist, fine to medium grained, several thin silt layers, no petroleum odor, no sheen (8 to 10 feet bgs). |
| | 018 | 11:45 | 1.8 | - | 7 | | |
| | | | | | 8 | SP | |
| | | | | | 9 | | |
| | | | | | 10 | | |
| | 019 | 11:50 | 2.1 | - | 11 | | SILT - olive grey, very moist, soft, slightly plastic, small wood fragment at 14.5 feet bgs, no petroleum odor, no sheen (10 to 17 feet bgs). |
| | | | | | 12 | | |
| | | | | | 13 | | |
| | | | | | 14 | ML | |
| | 020 | 12:00 | 2.4 | - | 15 | | |
| | | | | | 16 | | |
| | | | | | 17 | | |
| | | | | | 18 | | Sandy SILT with Gravel - grey with brown mottling, moist, gravels up to 1/4-inch diameter, no petroleum odor, no sheen (17 to 19 feet bgs). |
| | | | | | 19 | | |
| | 021 | 12:05 | 3.0 | - | 20 | SP | SAND - grey, moist, medium grained, several thin silt layers,no petroleum odor, no sheen (19 to 20 feet bgs). |



SCOEPA00010335

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-10** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 11:35 | DRILL FINISH Time: 15:00 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | Date: 08/03/01 | Date: 08/03/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | DEPTH (feet) | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | 21 | ML | Sandy SILT with Gravel and Cobble - grey, moist, few pieces of wood fragments, no sheen, no petroleum odor (20-24 feet bgs). |
| | | | | | 22 | | |
| | 022 | 12:10 | 3.2 | - | 23 | | |
| | | | | | 24 | | |
| | | | | | 25 | SM | Silty SAND with Gravel- grey, moist, pieces of burned wood fragments, abrupt color change at 26.5 feet bgs, no petroleum odor, no sheen (24-26.5 feet bgs). |
| | | | | | 26 | | |
| | 023 | 12:15 | 3.2 | ND | 27 | | SILT - tan with orange mottling, slightly moist, slightly plastic, stiff, minor wood fragments between 28 and 32 feet bgs, no petroleum odor, no sheen (26.5-35.5 feet bgs). |
| | | | | | 28 | | |
| | | | | | 29 | | |
| | 024 | 12:20 | 2.3 | ND | 30 | ML | |
| | | | | | 31 | | |
| | | | | | 32 | | |
| | | | | | 33 | | |
| | | | | | 34 | | |
| | | | | | 35 | | |
| | 025 | 12:30 | 2.4 | - | 36 | SM | Silty SAND -tan, very moist, no petroleum odor, no sheen (35.5-36 feet bgs). |
| | | | | | 37 | SP | SAND - brown, wet, fine-grained, minor muscovite, no petroleum odor, no sheen (36 to 37.5 feet bgs). |
| | | | | | 38 | | |
| | | | | | 39 | SM | Silty SAND -brown, very moist to wet, several 2 to 4-inch thick fine-grained sand layers, no petroleum odor, no sheen (37.5-41 feet bgs). |
| | 026 | 12:45 | 2.8 | - | 40 | | |



SCOEPA00010336

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-10** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 11:35 | DRILL FINISH Time: 15:00 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | Date: 08/03/01 | Date: 08/03/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | DEPTH (feet) | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | 41 | SM | SAND - brown, wet, fine-grained, poorly graded, minor muscovite, several thin (2 to 4-inch thick) silt layers between 48 and 52 feet bgs, no petroleum odor, no sheen (41-64 feet bgs). |
| | | | | | 42 | | |
| | | | | | 43 | | |
| | 027 | 12:55 | 2.6 | - | 44 | | |
| | | | | | 45 | | |
| | | | | | 46 | | |
| | | | | | 47 | SP | |
| | | | | | 48 | | |
| | | | | | 49 | | |
| | | | | | 50 | | |
| | 028 | 13:30 | 2.6 | - | 51 | | |
| | | | | | 52 | | |
| | | | | | 53 | | |
| | | | | | 54 | | |
| | | | | | 55 | | |
| | 029 | 14:00 | 2.6 | - | 56 | SP | |
| | | | | | 57 | | |
| | | | | | 58 | | |
| | | | | | 59 | | |
| | | | | | 60 | | |



SCOEPA00010337

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-10** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 11:35<br>Date: 08/03/01 | DRILL FINISH Time: 15:00<br>Date: 08/03/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| BORING DIAMETER: | 1.5-inch |
|---|---|
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 61 | | | |
| | | | | | | | 62 | | | |
| | | | | | | | 63 | | SP | |
| | 030 | 14:55 | - | - | | | 64 | | | |
| | | | | | | | 65 | | | Boring terminated at 64.0 feet bgs. |
| | | | | | | | 66 | | | *Sample prefix is 5237-010803- |
| | | | | | | | 67 | | | |
| | | | | | | | 68 | | | |
| | | | | | | | 69 | | | |
| | | | | | | | 70 | | | |
| | | | | | | | 71 | | | |
| | | | | | | | 72 | | | |
| | | | | | | | 73 | | | |
| | | | | | | | 74 | | | |
| | | | | | | | 75 | | | |
| | | | | | | | 76 | | | |
| | | | | | | | 77 | | | |
| | | | | | | | 78 | | | |
| | | | | | | | 79 | | | |
| | | | | | | | 80 | | | |



SCOEPA00010338

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-11** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon | HAI LOGGER: | Rob Ede | DRILL START Time: 9:15 | DRILL FINISH Time: 9:50 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | Date: 08/17/01 | Date: 08/17/01 |
| PROJECT #: 5237 | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | DEPTH (feet) | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|
| BentoniteChips | | | | | 1 | GP | Surface: asphalt with 4-inch gravel base (0 to 0.5 foot below ground surface (bgs)). |
| | | | | | 2 | | SAND with Gravel - brown, dry, minor (<1%) gravel, no petroleum odor, no sheen (0.5 to 7 feet bgs). |
| | 130 | 9:20 | 0.3 | - | 3 | | |
| | | | | | 4 | | |
| | | | | | 5 | | |
| | | | | | 6 | | |
| | 131 | 9:25 | 1.0 | - | 7 | | |
| | | | | | 8 | SP | SAND with Gravel - brown, dry, 1-inch thick discolored zone at 7 feet bgs and 8.5 feet bgs, slight petroleum odor, slight sheen (7 to 13.5 feet bgs). |
| | 132 | 9:28 | 1.6 | - | 9 | | |
| | | | | | 10 | | |
| | | | | | 11 | | |
| | | | | | 12 | | |
| | | | | | 13 | | |
| | | | | | 14 | | Silty SAND with Gravel - grey, slightly moist, no petroleum odor, no sheen (13.5 16 feet bgs). |
| | 133 | 9:36 | 1.6 | - | 15 | SM | |
| | | | | | 16 | | |
| | | | | | 17 | | Sandy SILT - olive grey, moist, several thin (<1-inch) fine grained sand layers, non-plastic, no petroleum odor, no sheen (16 to 20 feet bgs). |
| | | | | | 18 | | |
| | 134 | 9:40 | 2.4 | - | 19 | ML | Boring terminated at 20.0 feet bgs. |
| | | | | | 20 | | *Sample prefix is 5237-010817- |



SCOEPA00010339

B

**APPENDIX B**

**Push Probe Boring Logs:**
**August 2001**

**Groundwater Sampling**



SCOEPA00010341

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-2A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 8:23<br>Date: 08/16/01 | DRILL FINISH Time: 14:40<br>Date: 08/16/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) |
|---|---|---|---|---|---|---|---|---|---|
| Bentonite Chips | | | | | | | 1 | | |
| | | | | | | | 2 | | |
| | | | | | | | 3 | | |
| | | | | | | | 4 | | |
| | | | | | | | 5 | | |
| | | | | | | | 6 | | |
| | | | | | | | 7 | | |
| | | | | | | | 8 | | |
| | | | | | | | 9 | | |
| | | | | | | | 10 | | SP |
| Bentonite Grout | | | | | | | 11 | | |
| | | | | | | | 12 | | |
| | | | | | | | 13 | | |
| | | | | | | | 14 | | |
| | | | | | | | 15 | | |
| | | | | | | | 16 | | |
| | | | | | | | 17 | | |
| | | | | | | | 18 | | |
| | | | | | | | 19 | | |
| | | | | | | | 20 | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

SOIL DESCRIPTION

Note: No soil samples collected. Pushed with well point directly to groundwater sample depths. See boring log for probe P-2 for soil description



SCOEPA00010342

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-2A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 8:23 | DRILL FINISH Time: 14:40 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | Date: 08/16/01 | Date: 08/16/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 21 | | SP | |
| | | | | | | | 22 | | | |
| | | | | | | | 23 | | | |
| | | | | | | | 24 | | | |
| | | | | | | | 25 | | | |
| | | | | | | | 26 | | | |
| | | | | | | | 27 | | | |
| | Water Level measured for 28' - 32' bgs screen interval | | | | | | 28 | ▽ | | **GROUNDWATER SAMPLE**<br>Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 28 to 32 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010816-316) was collected with disposable tubing/check valve at 9:55 hours, 8/16/01. Water level was measured at 28.0 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced. |
| | | | | | | | 29 | | | |
| | | | | | | | 30 | | | |
| | | | | | | | 31 | | | |
| | | | | | | | 32 | | | |
| | | | | | | | 33 | | ML | |
| | | | | | | | 34 | | | |
| | | | | | | | 35 | | | |
| | | | | | | | 36 | | SM | |
| | | | | | | | 37 | | | |
| | | | | | | | 38 | | | |
| | | | | | | | 39 | | SP | |
| | | | | | | | 40 | | | |



SCOEPA00010343

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-2A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 8:23 Date: 08/16/01 | DRILL FINISH Time: 14:40 Date: 08/16/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 41 | | SP | |
| | | | | | | | 42 | | | |
| | | | | | | | 43 | | | |
| | Water Level measured for 54' - 58' bgs screen interval | | | | | | 44 | ▽ | | |
| | | | | | | | 45 | | ML | |
| | | | | | | | 46 | | SP | |
| | | | | | | | 47 | | ML | |
| | | | | | | | 48 | | | |
| | | | | | | | 49 | | SP | |
| | | | | | | | 50 | | ML | |
| | | | | | | | 51 | | SP | |
| | | | | | | | 52 | | | |
| | | | | | | | 53 | | SM | |
| | | | | | | | 54 | | | |
| | | | | | | | 55 | | | |
| | | | | | | | 56 | | SP | |
| | | | | | | | 57 | | | |
| | | | | | | | 58 | | | |
| | | | | | | | 59 | | | |
| | | | | | | | 60 | | | |

**GROUNDWATER SAMPLE**
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen a t54 to 58 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010816-317) was collected with disposable tubing/check valve at 11:11 hours, 8/16/01. Water level was measured at 44 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.



SCOEPA00010344

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-2A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 8:23 | DRILL FINISH Time: 14:40 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | Date: 08/16/01 | Date: 08/16/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 61 | | | |
| | | | | | | | 62 | | | |
| | | | | | | | 63 | | SM | |
| | | | | | | | 64 | | | |
| | | | | | | | 65 | | | |
| | | | | | | | 66 | | SP | |
| | | | | | | | 67 | | | |
| | | | | | | | 68 | | | |
| | | | | | | | 69 | | | |
| | | | | | | | 70 | | | |
| | | | | | | | 71 | | | |
| | | | | | | | 72 | | | |
| | | | | | | | 73 | | | |
| | | | | | | | 74 | | | |
| | | | | | | | 75 | | | |
| | | | | | | | 76 | | | |
| | | | | | | | 77 | | SP | |
| | | | | | | | 78 | | | |
| | | | | | | | 79 | | | |
| | | | | | | | 80 | | | |



SCOEPA00010345

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-2A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 8:23<br>Date: 08/16/01 | DRILL FINISH Time: 14:40<br>Date: 08/16/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
| Bentonite Grout | | | | | | | 81 | | | |
| | | | | | | | 82 | | | |
| | | | | | | | 83 | | | |
| | | | | | | | 84 | | | |
| | | | | | | | 85 | | SP | |
| | | | | | | | 86 | | | |
| | | | | | | | 87 | | | |
| | | | | | | | 88 | | | |
| | | | | | | | 89 | | | |
| | | | | | | | 90 | | | |
| | | | | | | | 91 | | | |
| | | | | | | | 92 | | | |
| | | | | | | | 93 | | | |
| | | | | | | | 94 | | | |
| | | | | | | | 95 | | | |
| | | | | | | | 96 | | | |
| | | | | | | | 97 | | | |
| | | | | | | | 98 | | | |
| | | | | | | | 99 | | | |
| | | | | | | | 100 | | | |

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: Not Measured
TOP OF CASING ELEVATION: Not Applicable

**GROUNDWATER SAMPLE**
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 96 to 100 feet bgs. Following the removal of approximately 1 liter of water, a groundwater sample (#5237-010816-318) was collected with disposable tubing/check valve at 12:57 hours, 8/16/01. Water level was measured at 57.9 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was abandoned.

Boring terminated at 100.0 feet bgs and sealed from base to 2 feet bgs with bentonite grout, and from 2 feet bgs to ground surface with bentonite chips.



SCOEPA00010346

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-3A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Jay Greifer | DRILL START Time: | DRILL FINISH Time: |
| | SAMPLING METHOD: | N/A | 8:38 | 13:36 |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | Date: | Date: |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | 08/21/01 | 08/21/01 |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) |
|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 1 | | SP |
| | | | | | | | 2 | | |
| | | | | | | | 3 | | |
| | | | | | | | 4 | | |
| | | | | | | | 5 | | |
| | | | | | | | 6 | | |
| | | | | | | | 7 | | |
| | | | | | | | 8 | | |
| | | | | | | | 9 | | |
| | | | | | | | 10 | | SP |
| | | | | | | | 11 | | |
| | | | | | | | 12 | | |
| | | | | | | | 13 | | |
| | | | | | | | 14 | | |
| | | | | | | | 15 | | |
| | | | | | | | 16 | | |
| | | | | | | | 17 | | |
| | | | | | | | 18 | | |
| | | | | | | | 19 | | |
| | | | | | | | 20 | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

SOIL DESCRIPTION

Note: No soil samples collected. Pushed with well point directly to groundwater sample depths. See boring log for probe P-3 for soil description



SCOEPA00010347

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-3A** | | | |
|---|---|---|---|---|
| | HAI LOGGER: | Jay Greifer | DRILL START | DRILL FINISH |
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon | SAMPLING METHOD: | N/A | Time: | Time: |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | 8:38 | 13:36 |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | Date: | Date: |
| PROJECT #: 5237 | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | 08/21/01 | 08/21/01 |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 21 | | | |
| | | | | | | | 22 | ▽ | | |
| | Water Level measured for 55' - 59' bgs screen interval | | | | | | 23 | | | |
| | | | | | | | 24 | | | |
| | | | | | | | 25 | | | |
| | | | | | | | 26 | | SP | |
| | | | | | | | 27 | | | |
| | | | | | | | 28 | | | |
| | Water Level measured for 28.5' - 32.5' bgs screen interval | | | | | | 29 | ▽ | | |
| | | | | | | | 30 | | | |
| | | | | | | | 31 | | | |
| | | | | | | | 32 | | | |
| | | | | | | | 33 | | | |
| | Water Level measured for 96' - 100' bgs screen interval | | | | | | 34 | ▽ | ML | |
| | | | | | | | 35 | | | |
| | | | | | | | 36 | | | |
| | | | | | | | 37 | | | |
| | | | | | | | 38 | | SM | |
| | | | | | | | 39 | | | |
| | | | | | | | 40 | | | |

**GROUNDWATER SAMPLE**
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 28.5 to 32.5 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010821-321) was collected with disposable tubing/check valve at 9:41 hours, 8/21/01. Water level was measured at 28.5 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.



SCOEPA00010348

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-3A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Jay Greifer | DRILL START Time: | DRILL FINISH Time: |
| | SAMPLING METHOD: | N/A | 8:38 | 13:36 |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | Date: | Date: |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | 08/21/01 | 08/21/01 |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 41 | | SM | |
| | | | | | | | 42 | | SP | |
| | | | | | | | 43 | | SM | |
| | | | | | | | 44 | | ML | |
| | | | | | | | 45 | | | |
| | | | | | | | 46 | | SP | |
| | | | | | | | 47 | | | |
| | | | | | | | 48 | | | |
| | | | | | | | 49 | | ML | |
| | | | | | | | 50 | | | |
| | | | | | | | 51 | | | |
| | | | | | | | 52 | | | |
| | | | | | | | 53 | | | |
| | | | | | | | 54 | | | |
| | | | | | | | 55 | | | |
| | | | | | | | 56 | | SP | |
| | | | | | | | 57 | | | |
| | | | | | | | 58 | | | |
| | | | | | | | 59 | | | |
| | | | | | | | 60 | | | |

**GROUNDWATER SAMPLE**
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 55 to 59 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010821-323) was collected with disposable tubing/check valve at 10:57 hours, 8/21/01. Water Level was measured at 22 feet bgs immediately prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.



SCOEPA00010349

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-3A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Jay Greifer | DRILL START Time: 8:38 | DRILL FINISH Time: 13:36 |
| | SAMPLING METHOD: | N/A | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | Date: 08/21/01 | Date: 08/21/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 61 | | SP | |
| | | | | | | | 62 | | | |
| | | | | | | | 63 | | | |
| | | | | | | | 64 | | | |
| | | | | | | | 65 | | | |
| | | | | | | | 66 | | | |
| | | | | | | | 67 | | | |
| | | | | | | | 68 | | | |
| | | | | | | | 69 | | | |
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| | | | | | | | 74 | | | |
| | | | | | | | 75 | | | |
| | | | | | | | 76 | | | |
| | | | | | | | 77 | | SP | |
| | | | | | | | 78 | | | |
| | | | | | | | 79 | | | |
| | | | | | | | 80 | | | |



SCOEPA00010350

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-3A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Jay Greifer | DRILL START Time: 8:38 Date: 08/21/01 | DRILL FINISH Time: 13:36 Date: 08/21/01 |
| | SAMPLING METHOD: | N/A | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 81 | | SP | |
| | | | | | | | 82 | | | |
| | | | | | | | 83 | | | |
| | | | | | | | 84 | | | |
| | | | | | | | 85 | | | |
| | | | | | | | 86 | | | |
| | | | | | | | 87 | | | |
| | | | | | | | 88 | | | |
| | | | | | | | 89 | | | |
| | | | | | | | 90 | | | |
| | | | | | | | 91 | | | |
| | | | | | | | 92 | | | |
| | | | | | | | 93 | | | |
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| | | | | | | | 95 | | | |
| | | | | | | | 96 | | | |
| | | | | | | | 97 | | | |
| | | | | | | | 98 | | | |
| | | | | | | | 99 | | | |
| | | | | | | | 100 | | | |

**GROUNDWATER SAMPLE**
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 96 to 100 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010821-325) was collected with disposable tubing/check valve at 12:10 hours, 8/21/01. Water level was measured at 34 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was abandoned.

Boring terminated at 100.0 feet bgs and sealed from base to top with bentonite grout.



SCOEPA00010351

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-4A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 8:43<br>Date: 08/15/01 | DRILL FINISH Time: 11:40<br>Date: 08/15/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Chips | | | | | | | 1 | | | Note: No soil samples collected. Pushed with well point directly to groundwater sample depths. See boring log for probe P-4 for soil description |
| | | | | | | | 2 | | | |
| | | | | | | | 3 | | SP | |
| | | | | | | | 4 | | | |
| | | | | | | | 5 | | | |
| | | | | | | | 6 | | | |
| | | | | | | | 7 | | | |
| | | | | | | | 8 | | | |
| | | | | | | | 9 | | | |
| | | | | | | | 10 | | | |
| Bentonite Grout | | | | | | | 11 | | | |
| | | | | | | | 12 | | | |
| | | | | | | | 13 | | | |
| | | | | | | | 14 | | | |
| | | | | | | | 15 | | SP | |
| | | | | | | | 16 | | | |
| | | | | | | | 17 | | | |
| | | | | | | | 18 | | | |
| | | | | | | | 19 | | | |
| | | | | | | | 20 | | | |



SCOEPA00010352

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-4A** | | | |
|---|---|---|---|---|
| | HAI LOGGER: | Rob Ede | DRILL START | DRILL FINISH |
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | Time: 8:43 | Time: 11:40 |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | Date: 08/15/01 | Date: 08/15/01 |
| PROJECT #: 5237 | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 21 | | | |
| | | | | | | | 22 | | | |
| | | | | | | | 23 | | | |
| | | | | | | | 24 | | | |
| | | | | | | | 25 | | | |
| | | | | | | | 26 | | SP | |
| | Water Level measured for 50' - 54' bgs screen interval | | | | | | 27 | ▽ | | |
| | | | | | | | 28 | | | |
| | Water Level measured for 28' - 32' bgs screen interval | | | | | | 29 | ▽ | | |
| | | | | | | | 30 | | | |
| | | | | | | | 31 | | SM | |
| | | | | | | | 32 | | | |
| | | | | | | | 33 | | ML | |
| | | | | | | | 34 | | SM | |
| | | | | | | | 35 | | | |
| | | | | | | | 36 | | | |
| | | | | | | | 37 | | | |
| | | | | | | | 38 | | ML | |
| | | | | | | | 39 | | | |
| | | | | | | | 40 | | SP | |

**GROUNDWATER SAMPLE**
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 28 to 32 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010815-309) was collected with disposable tubing/check valve at 10:06 hours, 8/15/01. Water level was measured at 28.5 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.



SCOEPA00010353

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-4A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 8:43<br>Date: 08/15/01 | DRILL FINISH Time: 11:40<br>Date: 08/15/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 41 | | SP | |
| | | | | | | | 42 | | SM | |
| | | | | | | | 43 | | SP | |
| | | | | | | | 44 | | ML | |
| | | | | | | | 45 | | | |
| | | | | | | | 46 | | SP | |
| | | | | | | | 47 | | | |
| | | | | | | | 48 | | | |
| | | | | | | | 49 | | | |
| | | | | | | | 50 | | | |
| | | | | | | | 51 | | | |
| | | | | | | | 52 | | | |
| | | | | | | | 53 | | | |
| | | | | | | | 54 | | | |
| | | | | | | | 55 | | | |
| | | | | | | | 56 | | | |
| | | | | | | | 57 | | | |
| | | | | | | | 58 | | | |
| | | | | | | | 59 | | | |
| | | | | | | | 60 | | | |

**GROUNDWATER SAMPLE**
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 50 to 54 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010815-310) was collected with disposable tubing/check valve at 11:33 hours, 8/15/01. Water level was measured at 27.5 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was abandoned.

Boring terminated at 54.0 feet bgs and sealed from base to 2 feet bgs with bentonite grout, and from 2 feet bgs to ground surface with bentonite chips.



SCOEPA00010354

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-5A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 12:06<br>Date: 08/15/01 | DRILL FINISH Time: 17:48<br>Date: 08/15/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) |
|---|---|---|---|---|---|---|---|---|---|
| Bentonite Chips | | | | | | | 1 | | GP |
| | | | | | | | 2 | | |
| | | | | | | | 3 | | SP |
| | | | | | | | 4 | | |
| | | | | | | | 5 | | |
| | | | | | | | 6 | | |
| | | | | | | | 7 | | |
| Bentonite Grout | | | | | | | 8 | | |
| | | | | | | | 9 | | |
| | | | | | | | 10 | | |
| | | | | | | | 11 | | |
| | | | | | | | 12 | | |
| | | | | | | | 13 | | |
| | | | | | | | 14 | | |
| | | | | | | | 15 | | SP |
| | | | | | | | 16 | | |
| | | | | | | | 17 | | |
| | | | | | | | 18 | | |
| | | | | | | | 19 | | |
| | | | | | | | 20 | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

SOIL DESCRIPTION

Note: No soil samples collected. Pushed with well point directly to groundwater sample depths. See boring log for probe P-5 for soil description



SCOEPA00010355

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-5A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 12:06<br>Date: 08/15/01 | DRILL FINISH Time: 17:48<br>Date: 08/15/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) |
|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 21 | | SP |
| | | | | | | | 22 | | |
| | | | | | | | 23 | | |
| | | | | | | | 24 | | |
| | | | | | | | 25 | | |
| | | | | | | | 26 | | |
| | | | | | | | 27 | | |
| | | | | | | | 28 | | |
| | Water Level measured for 29' - 33' bgs screen interval | | | | | | | ▽ | SM |
| | | | | | | | 29 | | |
| | | | | | | | 30 | | |
| | | | | | | | 31 | | |
| | | | | | | | 32 | | |
| | | | | | | | 33 | | |
| | | | | | | | 34 | | |
| | | | | | | | 35 | | ML |
| | | | | | | | 36 | | |
| | | | | | | | 37 | | SM |
| | | | | | | | 38 | | |
| | | | | | | | 39 | | ML |
| | | | | | | | 40 | | |

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: Not Measured
TOP OF CASING ELEVATION: Not Applicable

SOIL DESCRIPTION

**GROUNDWATER SAMPLE**
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 29 to 33 feet bgs. Following the removal of approximately 1 quart of water, groundwater samples (#5237-010815-311 and -312) were collected with disposable tubing/check valve at 14:04 hours, 8/15/01. Water level was measured at 28.5 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.



SCOEPA00010356

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-5A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 12:06<br>Date: 08/15/01 | DRILL FINISH Time: 17:48<br>Date: 08/15/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 41 | ▽ | ML<br>SP | |
| | Water Level measured for 52' - 56' bgs screen interval | | | | | | 42 | | | |
| | | | | | | | 43 | | SM | |
| | | | | | | | 44 | | | |
| | Water Level measured for 96' - 100' bgs screen interval | | | | | | 45 | ▽ | | |
| | | | | | | | 46 | | | |
| | | | | | | | 47 | | | |
| | | | | | | | 48 | | ML | |
| | | | | | | | 49 | | | |
| | | | | | | | 50 | | SP | |
| | | | | | | | 51 | | SM | |
| | | | | | | | 52 | | | |
| | | | | | | | 53 | | | |
| | | | | | | | 54 | | | |
| | | | | | | | 55 | | | |
| | | | | | | | 56 | | SP | |
| | | | | | | | 57 | | | |
| | | | | | | | 58 | | | |
| | | | | | | | 59 | | | |
| | | | | | | | 60 | | ML<br>SP | |

**GROUNDWATER SAMPLE**
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 52 to 56 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010815-313) was collected with disposable tubing/check valve at 15:10 hours, 8/15/01. Water level was measured at 41.0 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.



SCOEPA00010357

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-5A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 12:06<br>Date: 08/15/01 | DRILL FINISH Time: 17:48<br>Date: 08/15/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 61 | | | BORING DIAMETER: 1.5-inch<br>CASING DIAMETER: Not Applicable<br>SURFACE ELEVATION: Not Measured<br>TOP OF CASING ELEVATION: Not Applicable |
| | | | | | | | 62 | | | |
| | | | | | | | 63 | | | |
| | | | | | | | 64 | | | |
| | | | | | | | 65 | | | |
| | | | | | | | 66 | | | |
| | | | | | | | 67 | | | |
| | | | | | | | 68 | | SP | |
| | | | | | | | 69 | | | |
| | | | | | | | 70 | | | |
| | | | | | | | 71 | | | |
| | | | | | | | 72 | | | |
| | | | | | | | 73 | | | |
| | | | | | | | 74 | | | |
| | | | | | | | 75 | | | |
| | | | | | | | 76 | | | |
| | | | | | | | 77 | | | |
| | | | | | | | 78 | | | |
| | | | | | | | 79 | | | |
| | | | | | | | 80 | | | |



SCOEPA00010358

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-5A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 12:06<br>Date: 08/15/01 | DRILL FINISH Time: 17:48<br>Date: 08/15/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 81 | | | |
| | | | | | | | 82 | | | |
| | | | | | | | 83 | | | |
| | | | | | | | 84 | | | |
| | | | | | | | 85 | | | |
| | | | | | | | 86 | | | |
| | | | | | | | 87 | | SP | |
| | | | | | | | 88 | | | |
| | | | | | | | 89 | | | |
| | | | | | | | 90 | | | |
| | | | | | | | 91 | | | |
| | | | | | | | 92 | | | |
| | | | | | | | 93 | | | |
| | | | | | | | 94 | | | |
| | | | | | | | 95 | | | |
| | | | | | | | 96 | | | |
| | | | | | | | 97 | | | |
| | | | | | | | 98 | | | |
| | | | | | | | 99 | | | |
| | | | | | | | 100 | | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

Heaved Formation Sand

**GROUNDWATER SAMPLE**
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 96 to 100 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010815-314) was collected with disposable tubing/check valve at 16:41 hours, 8/15/01. Water level was measured at 44.5 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was abandoned.

Boring terminated at 100.0 feet bgs and sealed from base to1 foot bgs with bentonite grout, and from 1 foot bgs to ground surface with bentonite chips.



SCOEPA00010359

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-6A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 14:30 | DRILL FINISH Time: 18:00 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | Date: 08/02/01 | Date: 08/02/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Chips | | | | | | | 1 | | GP | Note: No soil samples collected. Pushed with well point directly to groundwater sample depths. See boring log for probe P-6 for soil description |
| | | | | | | | 2 | | SP | |
| | | | | | | | 3 | | | |
| | | | | | | | 4 | | | |
| | | | | | | | 5 | | | |
| | | | | | | | 6 | | | |
| | | | | | | | 7 | | SM | |
| | | | | | | | 8 | | | |
| | | | | | | | 9 | | | |
| Bentonite Grout | | | | | | | 10 | | | |
| | | | | | | | 11 | | SP | |
| | | | | | | | 12 | | | |
| | | | | | | | 13 | | | |
| | | | | | | | 14 | | | |
| | | | | | | | 15 | | | |
| | | | | | | | 16 | | concrete | |
| | | | | | | | 17 | | SP | **Note:** Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 16 to 20 feet bgs. Well point was dry. No groundwater sample was collected. The well point was removed from the borehole and the borehole was advanced. |
| | | | | | | | 18 | | | |
| | | | | | | | 19 | | SM | |
| | | | | | | | 20 | | | |



SCOEPA00010360

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-6A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 14:30<br>Date: 08/02/01 | DRILL FINISH Time: 18:00<br>Date: 08/02/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 21 | | SP | **Note:** Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 20 to 24 feet bgs. The well point was dry. No groundwater sample was collected. The well point was removed from the borehole and the borehole was advanced. |
| | | | | | | | 22 | | | |
| | | | | | | | 23 | | | |
| | | | | | | | 24 | | GP | |
| | | | | | | | 25 | | ML | |
| | | | | | | | 26 | | | |
| | | | | | | | 27 | | SM | |
| | | | | | | | 28 | | | |
| | | | | | | | 29 | | ML | |
| | | | | | | | 30 | ▽ | | Water Level measured for 32' - 36' bgs and 46' - 50' screen interval |
| | | | | | | | 31 | | | |
| | | | | | | | 32 | | | |
| | | | | | | | 33 | | | **GROUNDWATER SAMPLE**<br>Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 32 to 36 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010802-300) was collected with disposable tubing/check valve at 16:30 hours, 8/2/01. Water level was measured at 30.0 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced. |
| | | | | | | | 34 | | | |
| | | | | | | | 35 | | SP | |
| | | | | | | | 36 | | | |
| | | | | | | | 37 | | | |
| | | | | | | | 38 | | | |
| | | | | | | | 39 | | SM | |
| | | | | | | | 40 | | | |



SCOEPA00010361

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-6A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 14:30<br>Date: 08/02/01 | DRILL FINISH Time: 18:00<br>Date: 08/02/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 41 | | SP | |
| | | | | | | | 42 | | | |
| | | | | | | | 43 | | | |
| | | | | | | | 44 | | | |
| | | | | | | | 45 | | | |
| | | | | | | | 46 | | | |
| | | | | | | | 47 | | | |
| | | | | | | | 48 | | | |
| | | | | | | | 49 | | | |
| | | | | | | | 50 | | | |
| | | | | | | | 51 | | | |
| | | | | | | | 52 | | | |
| | | | | | | | 53 | | | |
| | | | | | | | 54 | | | |
| | | | | | | | 55 | | | |
| | | | | | | | 56 | | | |
| | | | | | | | 57 | | | |
| | | | | | | | 58 | | | |
| | | | | | | | 59 | | | |
| | | | | | | | 60 | | | |

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: Not Measured
TOP OF CASING ELEVATION: Not Applicable

**GROUNDWATER SAMPLE**
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 46 to 50 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010802-301) was collected with disposable tubing/check valve at 17:55 hours, 8/2/01. Water level was measured at 30.0 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was abandoned.

Boring terminated at 50.0 feet bgs and sealed from base to 2 feet bgs with bentonite grout, and from 2 feet bgs to ground surface with bentonite chips.



SCOEPA00010362

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-7A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 14:14 Date: 08/09/01 | DRILL FINISH Time: 17:10 Date: 08/09/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) |
|---|---|---|---|---|---|---|---|---|---|
| Bentonite Chips | | | | | | | 1 | | SM |
| | | | | | | | 2 | | |
| | | | | | | | 3 | | SP |
| | | | | | | | 4 | | |
| | | | | | | | 5 | | ML |
| | | | | | | | 6 | | |
| | | | | | | | 7 | | GP |
| | | | | | | | 8 | | SP |
| | | | | | | | 9 | | |
| Bentonite Grout | | | | | | | 10 | | |
| | | | | | | | 11 | | |
| | | | | | | | 12 | | |
| | | | | | | | 13 | | ML |
| | | | | | | | 14 | | |
| | | | | | | | 15 | | |
| | | | | | | | 16 | | |
| | | | | | | | 17 | | |
| | | | | | | | 18 | | |
| | | | | | | | 19 | | |
| | | | | | | | 20 | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

SOIL DESCRIPTION

Note: No soil samples collected. Pushed with well point directly to groundwater sample depths. See boring log for probe P-7 for soil description



SCOEPA00010363

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-7A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 14:14<br>Date: 08/09/01 | DRILL FINISH Time: 17:10<br>Date: 08/09/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| BORING DIAMETER: | 1.5-inch |
|---|---|
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 21 | | SM | **Note:** Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 21 to 25 feet bgs. Well point was dry. No groundwater sample was collected. The well point was removed from the borehole and the borehole was advanced. |
| | | | | | | | 22 | | | |
| | | | | | | | 23 | | | |
| | | | | | | | 24 | | GM | |
| | | | | | | | 25 | | | |
| | | | | | | | 26 | | | |
| | | | | | | | 27 | | | |
| | | | | | | | 28 | | | |
| | | | | | | | 29 | | | |
| | | | | | | | 30 | | | |
| | | | | | | | 31 | | ML | |
| | | | | | | | 32 | | | |
| | | | | | | | 33 | | | |
| | | | | | | | 34 | | | |
| | | | | | | | 35 | | | |
| | | | | | | | 36 | | | |
| | | | | | | | 37 | | | |
| | | | | | | | 38 | | | |
| | | | | | | | 39 | | | |
| | | | | | | | 40 | | | |



SCOEPA00010364

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-7A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 14:14 | DRILL FINISH Time: 17:10 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | Date: 08/09/01 | Date: 08/09/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 41 | | ML | |
| | | | | | | | 42 | | | |
| | | | | | | | 43 | | | |
| | | | | | | | 44 | | | |
| | | | | | | | 45 | | | |
| | | | | | | | 46 | | | |
| | | | | | | | 47 | | | |
| | | | | | | | 48 | | | |
| | | | | | | | 49 | | | |
| | | | | | | | 50 | | SM | |
| | | | | | | | 51 | | | |
| | | | | | | | 52 | | | |
| | | | | | | | 53 | | SP | |
| | | | | | | | 54 | | SM | |
| | | | | | | | 55 | | SP | |
| | Water Level measured for 58' - 62' bgs screen interval | | | | | | 56 | ▽ | | |
| | | | | | | | 57 | | ML | |
| | | | | | | | 58 | | SM | |
| | | | | | | | 59 | | SP | |
| | | | | | | | 60 | | | |

**GROUNDWATER SAMPLE**
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 58 to 62 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010809-307) was collected with disposable tubing/check valve at 16:46 hours, 8/9/01. Water level was measured at 56.0 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.



SCOEPA00010365

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-7A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 14:14 | DRILL FINISH Time: 17:10 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | Date: 08/09/01 | Date: 08/09/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| BORING DIAMETER: | 1.5-inch |
|---|---|
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 61 | | SM | |
| | | | | | | | 62 | | | |
| | | | | | | | 63 | | | |
| | | | | | | | 64 | | SP | |
| | | | | | | | 65 | | | Boring terminated at 64.0 feet bgs and sealed from base to 1 foot bgs with bentonite grout, and from 1 foot bgs to ground surface with bentonite chips. |
| | | | | | | | 66 | | | |
| | | | | | | | 67 | | | |
| | | | | | | | 68 | | | |
| | | | | | | | 69 | | | |
| | | | | | | | 70 | | | |
| | | | | | | | 71 | | | |
| | | | | | | | 72 | | | |
| | | | | | | | 73 | | | |
| | | | | | | | 74 | | | |
| | | | | | | | 75 | | | |
| | | | | | | | 76 | | | |
| | | | | | | | 77 | | | |
| | | | | | | | 78 | | | |
| | | | | | | | 79 | | | |
| | | | | | | | 80 | | | |



SCOEPA00010366

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-8A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 8:30 Date: 08/06/01 | DRILL FINISH Time: 18:30 Date: 08/07/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) |
|---|---|---|---|---|---|---|---|---|---|
| Bentonite Chips | | | | | | | 1 | | SM |
| | | | | | | | 2 | | |
| | | | | | | | 3 | | |
| | | | | | | | 4 | | |
| | | | | | | | 5 | | |
| | | | | | | | 6 | | SP |
| | | | | | | | 7 | | |
| | | | | | | | 8 | | |
| | | | | | | | 9 | | |
| Bentonite Grout | | | | | | | 10 | | |
| | | | | | | | 11 | | |
| | | | | | | | 12 | | |
| | | | | | | | 13 | | ML |
| | | | | | | | 14 | | |
| | | | | | | | 15 | | |
| | | | | | | | 16 | | SP |
| | | | | | | | 17 | | |
| | | | | | | | 18 | | |
| | | | | | | | 19 | | ML |
| | | | | | | | 20 | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

SOIL DESCRIPTION

Note: No soil samples collected. Pushed with well point directly to groundwater sample depths. See boring log for probe P-8 for soil description



SCOEPA00010367

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-8A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 8:30<br>Date: 08/06/01 | DRILL FINISH Time: 18:30<br>Date: 08/07/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 21 | | ML |
| | | | | | | | 22 | | |
| | | | | | | | 23 | | |
| | | | | | | | 24 | | SP |
| | | | | | | | 25 | | SM |
| | | | | | | | 26 | | |
| | | | | | | | 27 | | |
| | | | | | | | 28 | | SP |
| | | | | | | | 29 | | |
| Bentonite Grout | Water Level measured for 28' - 32' bgs screen interval | | | | | | 30 | ▽ | |
| | | | | | | | 31 | | |
| | | | | | | | 32 | | |
| | | | | | | | 33 | | |
| | | | | | | | 34 | | |
| | | | | | | | 35 | | |
| | | | | | | | 36 | | SM |
| | | | | | | | 37 | | |
| | | | | | | | 38 | | |
| | | | | | | | 39 | | |
| | | | | | | | 40 | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

SOIL DESCRIPTION

**GROUNDWATER SAMPLE**
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 28 to 32 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010809-304) was collected with disposable tubing/check valve at 9:56 hours, 8/9/01. Water level was measured at 29.5 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.



SCOEPA00010368

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-8A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 8:30 | DRILL FINISH Time: 18:30 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | Date: 08/06/01 | Date: 08/07/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 41 | | SM | |
| | | | | | | | 42 | | | |
| | | | | | | | 43 | | | |
| | Water Level measured for 80' - 84' bgs screen interval | | | | | | 44 | ▽ | | |
| | | | | | | | 45 | | | |
| | | | | | | | 46 | | SP | |
| | | | | | | | 47 | | ML | |
| | | | | | | | 48 | | SM | |
| | | | | | | | 49 | | | |
| | Water Level measured for 50' - 54' bgs screen interval | | | | | | 50 | ▽ | | |
| | | | | | | | 51 | | | |
| | | | | | | | 52 | | SP | |
| | | | | | | | 53 | | | |
| | | | | | | | 54 | | | |
| | | | | | | | 55 | | | |
| | | | | | | | 56 | | | |
| | | | | | | | 57 | | | |
| | | | | | | | 58 | | | |
| | | | | | | | 59 | | | |
| | | | | | | | 60 | | | |

**GROUNDWATER SAMPLE**
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 50 to 54 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010809-305) was collected with disposable tubing/check valve at 11:03 hours, 8/9/01. Water level was measured at 29.5 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.



SCOEPA00010369

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-8A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 8:30 Date: 08/06/01 | DRILL FINISH Time: 18:30 Date: 08/07/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| BORING DIAMETER: | 1.5-inch |
|---|---|
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 61 | | SP | |
| | | | | | | | 62 | | | |
| | | | | | | | 63 | | | |
| | | | | | | | 64 | | ML | |
| | | | | | | | 65 | | | |
| | | | | | | | 66 | | | |
| | | | | | | | 67 | | | |
| | | | | | | | 68 | | | |
| | | | | | | | 69 | | | |
| | | | | | | | 70 | | | |
| | | | | | | | 71 | | | |
| | | | | | | | 72 | | SP | |
| | | | | | | | 73 | | | |
| | | | | | | | 74 | | | |
| | | | | | | | 75 | | | |
| | | | | | | | 76 | | | |
| | | | | | | | 77 | | | |
| | | | | | | | 78 | | | |
| | | | | | | | 79 | | | |
| | | | | | | | 80 | | | |



SCOEPA00010370

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-8A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 8:30<br>Date: 08/06/01 | DRILL FINISH Time: 18:30<br>Date: 08/07/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Marcus Johnson | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| BORING DIAMETER: | 1.5-inch |
|---|---|
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 81 | | SP | **GROUNDWATER SAMPLE**<br>Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 80 to 84 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010809-306) was collected with disposable tubing/check valve at 12:36 hours, 8/9/01. Water level was measured at 44.0 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was abandoned. |
| | | | | | | | 82 | | | |
| | | | | | | | 83 | | | |
| | | | | | | | 84 | | | |
| | | | | | | | 85 | | | |
| | | | | | | | 86 | | | |
| | | | | | | | 87 | | bedrock? | |
| | | | | | | | 88 | | | Boring terminated at 84.0 feet bgs and sealed from base to 1 foot bgs with bentonite grout, and from 1 foot bgs to ground surface with bentonite chips. |
| | | | | | | | 89 | | | |
| | | | | | | | 90 | | | |
| | | | | | | | 91 | | | |
| | | | | | | | 92 | | | |
| | | | | | | | 93 | | | |
| | | | | | | | 94 | | | |
| | | | | | | | 95 | | | |
| | | | | | | | 96 | | | |
| | | | | | | | 97 | | | |
| | | | | | | | 98 | | | |
| | | | | | | | 99 | | | |
| | | | | | | | 100 | | | |



SCOEPA00010371

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-9A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 15:41 | DRILL FINISH Time: 17:00 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | Date: 08/16/01 | Date: 08/16/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) |
|---|---|---|---|---|---|---|---|---|---|
| BentoniteChips | | | | | | | 1 | | GP |
| | | | | | | | 2 | | |
| | | | | | | | 3 | | |
| | | | | | | | 4 | | |
| | | | | | | | 5 | | |
| | | | | | | | 6 | | |
| | | | | | | | 7 | | |
| | | | | | | | 8 | | |
| | | | | | | | 9 | | |
| | | | | | | | 10 | | SP |
| | | | | | | | 11 | | |
| | | | | | | | 12 | | |
| | | | | | | | 13 | | |
| | | | | | | | 14 | | |
| | | | | | | | 15 | | |
| | | | | | | | 16 | | |
| | | | | | | | 17 | | |
| | | | | | | | 18 | | |
| | | | | | | | 19 | | |
| | | | | | | | 20 | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

SOIL DESCRIPTION

Note: No soil samples collected. Pushed with well point directly to groundwater sample depths. See boring log for probe P-9 for soil description



SCOEPA00010372

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-9A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 15:41<br>Date: 08/16/01 | DRILL FINISH Time: 17:00<br>Date: 08/16/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| BORING DIAMETER: | 1.5-inch |
|---|---|
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 21 | | SP | |
| | | | | | | | 22 | | GM | |
| | | | | | | | 23 | | SP | |
| | | | | | | | 24 | | ML | |
| | | | | | | | 25 | | SP | |
| | | | | | | | 26 | | SM | |
| | | | | | | | 27 | | | |
| | | | | | | | 28 | | ML | |
| | | | | | | | 29 | | SP | |
| | | | | | | | 30 | | ML | |
| | Water Level measured for 31' - 35' bgs screen interval | | | | | | 31 | ▽ | SP | **GROUNDWATER SAMPLE**<br>Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 31 to 35 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010816-320) was collected with disposable tubing/check valve at 17:20 hours, 8/16/01. Water level was measured at 30.4 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was abandoned. |
| | | | | | | | 32 | | | |
| | | | | | | | 33 | | | |
| | | | | | | | 34 | | | |
| | | | | | | | 35 | | | |
| | | | | | | | 36 | | ML | |
| | | | | | | | 37 | | | |
| | | | | | | | 38 | | SP | |
| | | | | | | | 39 | | | |
| | | | | | | | 40 | | | |



SCOEPA00010373

C

# APPENDIX C

## Monitoring Well Construction Logs:

## WS-8-33, WS-8-59, and WS-9-34



SCOEPA00010375

| HAHN & ASSOCIATES, INC. | MONITORING WELL NUMBER | WS-8-33 | | |
|---|---|---|---|---|
| 434 NW Sixth Avenue | | OWRD #L52678 Start Card #135292 | | |
| Portland, Oregon | | | | |
| (503) 796-0717 | HAI LOGGER: | Jill Bets | DRILL START | DRILL FINISH |
| PROJECT: | SAMPLING METHOD: | 1.5-inch OD Split Spoon | | |
| RI / Source Control Evaluation | DRILLING METHOD: | 6 1/4-inch ID Hollow Stem Auger | Time: | Time: |
| Wacker Siltronic Corporation Property | EQUIPMENT TYPE | B-59 Mobil Drill | 15:30 | 16:15 |
| Portland, Oregon | DRILLER: | Armando Paco | Date: | Date: |
| PROJECT: 5237 | DRILLING CONTRACTOR: | Geo-Tech Explorations | 12-Sep-01 | 12-Sep-01 |

| | |
|---|---|
| BORING DIAMETER: | 10-inch |
| CASING DIAMETER: | 2-inch ID |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Measured |

| WELL CONSTRUCTION DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS TOTAL PAHs (ppm) | SPLIT SPOON BLOW COUNT | RECOVERY (%) | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Flush Monument | | | | | | | | | | Ground surface |
| Concrete | | | | | | | 1 | | | NOTE: No Soil Samples Collected. For full Soil Description, see log for boring P-3, installed approximately 5 feet to the northwest of WS-8-33. |
| | | | | | | | 2 | | | |
| | | | | | | | 3 | | | |
| | | | | | | | 4 | | | |
| | | | | | | | 5 | | SP | |
| | | | | | | | 6 | | | |
| | | | | | | | 7 | | | |
| | | | | | | | 8 | | | |
| | | | | | | | 9 | | | |
| Bentonite Chips | | | | | | | 10 | | | |
| 2-inch ID Blank Schedule 40 PVC | | | | | | | 11 | | | |
| | | | | | | | 12 | | | |
| | | | | | | | 13 | | | |
| | | | | | | | 14 | | | |
| | | | | | | | 15 | | | |
| | | | | | | | 16 | | | |
| | | | | | | | 17 | | | |
| | | | | | | | 18 | | SP | |
| | | | | | | | 19 | | | |
| | | | | | | | 20 | | | |



SCOEPA00010376

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **MONITORING WELL NUMBER** WS-8-33<br>OWRD #L52678 Start Card #135292 | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT: 5237 | HAI LOGGER: | Jill Bets | DRILL START<br>Time:<br>15:30<br>Date:<br>12-Sep-01 | DRILL FINISH<br>Time:<br>16:15<br>Date:<br>12-Sep-01 |
| | SAMPLING METHOD: | 1.5-inch OD Split Spoon | | |
| | DRILLING METHOD: | 6 1/4-inch ID Hollow Stem Auger | | |
| | EQUIPMENT TYPE | B-59 Mobil Drill | | |
| | DRILLER: | Armando Paco | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations | | |

| | |
|---|---|
| BORING DIAMETER: | 10-inch |
| CASING DIAMETER: | 2-inch ID |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Measured |

| WELL CONSTRUCTION DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS TOTAL PAHs (ppm) | SPLIT SPOON BLOW COUNT | RECOVERY (%) | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Colorado 10-20 Sand Pack<br>2-inch ID 0.020-inch Stainless Steel Slotted Screen<br>Cap | | | | | | | 21<br>22<br>23<br>24<br>25<br>26<br>27<br>28<br>29<br>30<br>31<br>32<br>33<br>34<br>35<br>36<br>37<br>38<br>39<br>40 | 9/12/01 | SP<br>ML<br>SM | Boring terminated at 33.0 feet bgs<br>Monitoring well installed to 33.0 feet bgs<br><br>Materials:<br>0.5-feet PVC sump/end cap<br>10 feet 2-inch diameter, 0.010-inch PVC slotted screen<br>23 feet 2-inch diameter PVC blank casing<br>12 50# bags 10/20 Colorado sand<br>9 50# bags bentonite chips<br>1 locking cap<br>Flush steel monument |



SCOEPA00010377

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **MONITORING WELL NUMBER** | | **WS-8-59** | |
|---|---|---|---|---|
| | OWRD #L52677 Start Card #135291 | | | |
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT: 5237 | HAI LOGGER: | Jill Bets | DRILL START<br>Time: 9:30<br>Date: 12-Sep-01 | DRILL FINISH<br>Time: 14:57<br>Date: 12-Sep-01 |
| | SAMPLING METHOD: | 1.5-inch OD Split Spoon | | |
| | DRILLING METHOD: | 6 1/4-inch ID Hollow Stem Auger | | |
| | EQUIPMENT TYPE | B-59 Mobil Drill | | |
| | DRILLER: | Armando Paco | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations | | |

| WELL CONSTRUCTION DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS TOTAL PAHs (ppm) | SPLIT SPOON BLOW COUNT | RECOVERY (%) | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Flush Monument | | | | | | | | | | Ground surface |
| Concrete | | | | | | | 1 | | | |
| | | | | | | | 2 | | | |
| | | | | | | | 3 | | | |
| | | | | | | | 4 | | | |
| | | | | | | | 5 | | SP | |
| Bentonite Chips | | | | | | | 6 | | | |
| | | | | | | | 7 | | | |
| | | | | | | | 8 | | | |
| | | | | | | | 9 | | | |
| | | | | | | | 10 | | | |
| 2-inch ID Blank Schedule 40 PVC | | | | | | | 11 | | | |
| | | | | | | | 12 | | | |
| | | | | | | | 13 | | | |
| | | | | | | | 14 | | | |
| | | | | | | | 15 | | | |
| | | | | | | | 16 | | | |
| | | | | | | | 17 | | | |
| Bentonite Grout | | | | | | | 18 | | SP | |
| | | | | | | | 19 | | | |
| | | | | | | | 20 | | | |

| | |
|---|---|
| BORING DIAMETER: | 10-inch |
| CASING DIAMETER: | 2-inch ID |
| SURFACE ELEVATION: | |
| TOP OF CASING ELEVATION: | |

NOTE: For full Soil Description, see log for boring P-3, installed approximately 5 feet to the north of WS-8-59.



SCOEPA00010378

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **MONITORING WELL NUMBER** | **WS-8-59** | |
|---|---|---|---|
| | OWRD #L52677 Start Card #135291 | | |
| PROJECT: | HAI LOGGER: Jill Bets | DRILL START | DRILL FINISH |
| RI / Source Control Evaluation | SAMPLING METHOD: 1.5-inch OD Split Spoon | | |
| Wacker Siltronic Corporation Property | DRILLING METHOD: 6 1/4-inch ID Hollow Stem Auger | Time: 9:30 | Time: 14:57 |
| Portland, Oregon | EQUIPMENT TYPE B-59 Mobil Drill | | |
| PROJECT: 5237 | DRILLER: Armando Paco | Date: 12-Sep-01 | Date: 12-Sep-01 |
| | DRILLING CONTRACTOR: Geo-Tech Explorations | | |

BORING DIAMETER: 10-inch
CASING DIAMETER: 2-inch ID
SURFACE ELEVATION:
TOP OF CASING ELEVATION:

| WELL CONSTRUCTION DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS TOTAL PAHs (ppm) | SPLIT SPOON BLOW COUNT | RECOVERY (%) | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentomite Grout<br>2-inch ID Blank Schedule 40 PVC | | | | | | | 21<br>22<br>23<br>24<br>25<br>26<br>27<br>28<br>29<br>30<br>31<br>32<br>33<br>34<br>35<br>36<br>37<br>38<br>39<br>40 | 9/12/01 | SP<br>ML<br>SM | |



SCOEPA00010379

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **MONITORING WELL NUMBER** | **WS-8-59** | |
|---|---|---|---|
| | OWRD #L52677 Start Card #135291 | | |
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT: 5237 | HAI LOGGER: Jill Bets | DRILL START Time: 9:30 Date: 12-Sep-01 | DRILL FINISH Time: 14:57 Date: 12-Sep-01 |
| | SAMPLING METHOD: 1.5-inch OD Split Spoon | | |
| | DRILLING METHOD: 6 1/4-inch ID Hollow Stem Auger | | |
| | EQUIPMENT TYPE B-59 Mobil Drill | | |
| | DRILLER: Armando Paco | | |
| | DRILLING CONTRACTOR: Geo-Tech Explorations | | |

BORING DIAMETER: 10-inch
CASING DIAMETER: 2-inch ID
SURFACE ELEVATION:
TOP OF CASING ELEVATION:

| WELL CONSTRUCTION DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS TOTAL PAHs (ppm) | SPLIT SPOON BLOW COUNT | RECOVERY (%) | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout / Bentonite Chip Plug / 2-inch ID Blank Schedule 40 PVC | | | | | | | 41 | | SM | |
| | | | | | | | 42 | | SP | |
| | | | | | | | 43 | | SM | |
| | | | | | | | 44 | | ML | |
| | | | | | | | 45 | | | |
| | | | | | | | 46 | | SP | Boring terminated at 59.0 feet bgs<br>Monitoring well installed to 59.0 feet bgs<br>Well Pressure Grouted from bentonite plug to 15 feet bgs, remainder sealed with bentonite chips. |
| | | | | | | | 47 | | | |
| | | | | | | | 48 | | | Materials:<br>0.5-feet PVC sump/end cap<br>10 feet 2-inch diameter, 0.010-inch PVC slotted screen<br>50 feet 2-inch diameter PVC blank casing<br>18 50# bags 10/20 Colorado sand<br>14 50# bags bentonite chips<br>110 gallons bentonite grout<br>1 locking cap<br>Flush steel monument |
| | | | | | | | 49 | | | |
| | | | | | | | 50 | | ML | |
| Colorado 10-20 Sand Pack / 2-inch ID 0.020-inch Stainless Steel Slotted Screen | | | | | | | 51 | | | |
| | | | | | | | 52 | | | |
| | | | | | | | 53 | | | |
| | | | | | | | 54 | | SP | |
| | | | | | | | 55 | | | |
| | | | | | | | 56 | | | NOTE: Split spoon sample collected at 56 to 57.5 feet bgs indicates Sandy SILT, grey, wet, no sheen, with an approximate 2-inch silt layer just above 57.5 feet bgs. Driller reported approximately 1 foot of heave in the augers prior to collecting this sample, thereby indicating much of the collected split spoon sample is likely representative of the heave originating from the base of the augers. |
| | - | 11:20 | - | - | 3 | 100 | | | | |
| | | | | | 4 | 100 | 57 | | | |
| | | | | | 13 | 100 | | | ML | |
| | | | | | | | 58 | | | NOTE: Split spoon sample collected at 58.5 to 60 feet bgs indicates SAND grey, wet, fine grained, with some silt present, no sheen. Driller reported 4 feet of heave in the augers prior to collecting this sample, thereby indicating the collected split spoon sample is likely representative of the heave originating from the base of the augers. |
| Cap | - | 11:55 | - | - | 3 | 100 | 59 | | SP | |
| | | | | | 4 | 100 | | | | |
| | | | | | 5 | 100 | 60 | | | |



SCOEPA00010380

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **MONITORING WELL NUMBER** | | **WS-9-34** | |
|---|---|---|---|---|
| | OWRD #L52679 Start Card #135293 | | | |
| PROJECT: | HAI LOGGER: | Jill Bets | DRILL START | DRILL FINISH |
| RI / Source Control Evaluation | SAMPLING METHOD: | 1.5-inch OD Split Spoon | Time: | Time: |
| Wacker Siltronic Corporation Property | DRILLING METHOD: | 6 1/4-inch ID Hollow Stem Auger | 15:30 | 16:15 |
| Portland, Oregon | EQUIPMENT TYPE | B-59 Mobil Drill | Date: | Date: |
| PROJECT: 5237 | DRILLER: | Armando Paco | 13-Sep-01 | 13-Sep-01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations | | |

| BORING DIAMETER: | 10-inch |
|---|---|
| CASING DIAMETER: | 2-inch ID |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Measured |

| WELL CONSTRUCTION DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS TOTAL PAHs (ppm) | SPLIT SPOON BLOW COUNT | RECOVERY (%) | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Flush Monument | | | | | | | | | | Ground surface |
| Concrete | | | | | | | | | GP | |
| | | | | | | | 1 | | | NOTE: No Soil Samples Collected. For full Soil Description, see log for boring P-5, installed approximately10 feet to the east of WS-9-34. |
| | | | | | | | 2 | | | |
| | | | | | | | 3 | | | |
| | | | | | | | 4 | | | |
| | | | | | | | 5 | | SP | |
| | | | | | | | 6 | | | |
| | | | | | | | 7 | | | |
| | | | | | | | 8 | | | |
| Bentonite Chips | | | | | | | 9 | | | |
| | | | | | | | 10 | | | |
| 2-inch ID Blank Schedule 40 PVC | | | | | | | 11 | | | |
| | | | | | | | 12 | | | |
| | | | | | | | 13 | | | |
| | | | | | | | 14 | | SP | |
| | | | | | | | 15 | | | |
| | | | | | | | 16 | | | |
| | | | | | | | 17 | | | |
| | | | | | | | 18 | | | |
| | | | | | | | 19 | | | |
| | | | | | | | 20 | | | |



SCOEPA00010381

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **MONITORING WELL NUMBER** | | **WS-9-34** | |
|---|---|---|---|---|
| | OWRD #L52679 Start Card #135293 | | | |
| PROJECT: | HAI LOGGER: | Jill Bets | DRILL START | DRILL FINISH |
| RI / Source Control Evaluation | SAMPLING METHOD: | 1.5-inch OD Split Spoon | | |
| Wacker Siltronic Corporation Property | DRILLING METHOD: | 6 1/4-inch ID Hollow Stem Auger | Time: 15:30 | Time: 16:15 |
| Portland, Oregon | EQUIPMENT TYPE | B-59 Mobil Drill | | |
| PROJECT: 5237 | DRILLER: | Armando Paco | Date: 13-Sep-01 | Date: 13-Sep-01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations | | |

| | |
|---|---|
| BORING DIAMETER: | 10-inch |
| CASING DIAMETER: | 2-inch ID |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Measured |

| WELL CONSTRUCTION DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS TOTAL PAHs (ppm) | SPLIT SPOON BLOW COUNT | RECOVERY (%) | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Colorado 10-20 Sand Pack<br>2-inch ID 0.020-inch Stainless Steel Slotted Screen<br>Cap | | | | | | | 21<br>22<br>23<br>24<br>25<br>26<br>27<br>28<br>29<br>30<br>31<br>32<br>33<br>34<br>35<br>36<br>37<br>38<br>39<br>40 | | SP<br>SM<br>ML<br>SM<br>ML | Boring terminated at 34.0 feet bgs<br>Monitoring well installed to 34.0 feet bgs<br>Well was dry upon completion.<br><br>Materials:<br>0.5-feet PVC sump/end cap<br>10 feet 2-inch diameter, 0.010-inch PVC slotted screen<br>24 feet 2-inch diameter PVC blank casing<br>15 50# bags 10/20 Colorado sand<br>8 50# bags bentonite chips<br>1 locking cap<br>Flush steel monument |



SCOEPA00010382

SCOEPA00010383

**APPENDIX D**

**GeoPotential, Inc. Report:**

***Summary Report, Subsurface Mapping Survey, Wacker Siltronic Corporation, 7200 NW Front Avenue, Portland, Oregon*, dated August 25, 2001**



SCOEPA00010384

GeoPotential

ENVIRONMENTAL & EXPLORATION GEOPHYSICS

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E-Mail: rpsiii@aol.com

# SUMMARY REPORT

## SUBSURFACE MAPPING SURVEY

**WACKER SILTRONIC CORPORATION**
**7200 NW FRONT AVENUE**
**PORTLAND, OREGON**

**CLIENT**

**HAHN & ASSOCIATES, INC.**
**434 NW 6TH AVENUE, SUITE 203**
**PORTLAND, OREGON 97209**

**August 25, 2001**

**GeoPotential Project Number 3847**

# CONTENTS

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SURVEY OBJECTIVES --- PAGE 1.
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LIMITATIONS - PAGE 2.

## FIGURES

Figure 1 – GPR PROFILE 12
Figure 2 – GPR PROFILE 2
Figure 3 – GPR PROFILE 3
Figure 4 – SITE MAP

## APPENDIX

GROUND PENETRATING RADAR SURVEYS

## INTRODUCTION

GeoPotential performed a SUBSURFACE MAPPING SURVEY for HAHN AND ASSOCIATES (HAI), Portland, Oregon. SUBSURFACE MAPPING SURVEYS are geophysical surveys that utilize geophysical data and methods to identify and map the locations of subsurface features.

Ralph Soule and Nikos Tzetos of GeoPotential performed the SURVEY.

## TIMING

The field survey was completed on August 3, 2001. Report with maps was completed and mailed on August 25, 2001.

## SURVEY OBJECTIVES

The SUBSURFACE MAPPING SURVEY was designed to map the location of Underground Utility lines and buried stream channels.

## SURVEY SITE

The SURVEY SITE consisted of the embankment and shore along the Willamette River of the Wacker Siltonic Corporation located at 7200 NW Front Avenue in Portland, Oregon.

HAI provided GeoPotential with a map showing the approximate location of utility lines and buried stream channels along the embankment. The embankment consists of approximately 30 feet of fill material. The stream channels, Natural gas line and an abandoned storm water effluent line are buried beneath the fill material. Currently active storm water effluent lines are buried within the fill material.

## SURVEY SPECIFICATIONS

One instrument was used to conduct the survey:

- MALA RAMAC GROUND PENETRATING RADAR (GPR SURVEY).

GPR surveys can detect both metallic and non-metallic features. When searching for utility lines or buried stream channels GPR SURVEYS can often detect the disturbed soil in the stream channel and utility trenches. The accompanying APPENDIX describes the use of GPR SURVEYS.

The GPR EMBANKMENT SURVEY consisted of a series of GPR PROFILES acquired parallel to the shore along the top of the embankment to identify the locations of utility lines within the embankment. To identify the location of the "Former Channelized Creek Discharge (1941 – 1967)" GPR SHORELINE SURVEY conducted parallel to the base of the embankment along the shore of the Willamette River.

Both 250 Megahertz (MHz) and 100 (MHz) antennas were used for the GPR EMBANKMENT SURVEY on the embankment. A 250 MHz antenna was used for the GPR SHORELINE SURVEY. An assumed soil velocity of 80 centimeters/nanosecond was used for processing GPR data.



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## RESULTS

The results are shown on the accompanying Figures 1 through 4. Results were marked on the SITE with white marking paint.

The locations of the utility lines within the embankment approximately agree with the locations shown on HAI Figure 9. These consist of the storm water sewer lines and the combined storm water / process effluent sewer line. The two - sub embankment abandoned utility lines were not identified on the GPR embankment survey. They are buried to deep to be detected with the GPR data. Due to the rocky shoreline in the vicinity of these utilities it was not possible to search for these two utilities with a GPR shoreline survey. Also the "Former Channelized Creek Discharge (1913 – 1941)" could not be SURVEYED due to the Rocky Shoreline.

Figure 1 shows the results of the GPR shoreline survey for the "Former Channelized Creek Discharge (1941 – 1987)". The GPR PROFILE has been superimposed over a photograph of the embankment with the Wacker plant in the background. The GPR Profile shows a disturbed soil zone, which is interpreted as the former stream channel.

Figure 3 shows a disturbed soil zone along GPR PROFILE 3 that was conducted along the embankment to the Southwest of Figure 1. The disturbed soil zone identified along this profile is interpreted to possibly be caused by subsidence in the embankment fill material caused by the underlying buried stream channel.

Figure 2 shows a disturbed soil zone and storm drain line along GPR PROFILE 2.

Figure 4 shows the mapped locations of the above features. In addition are four shallow (2 to 4 feet deep) pipes identified from the GPR SURVEY along the Southeastern GPR SURVEY. The function of these pipes was not determined.

## LIMITATIONS

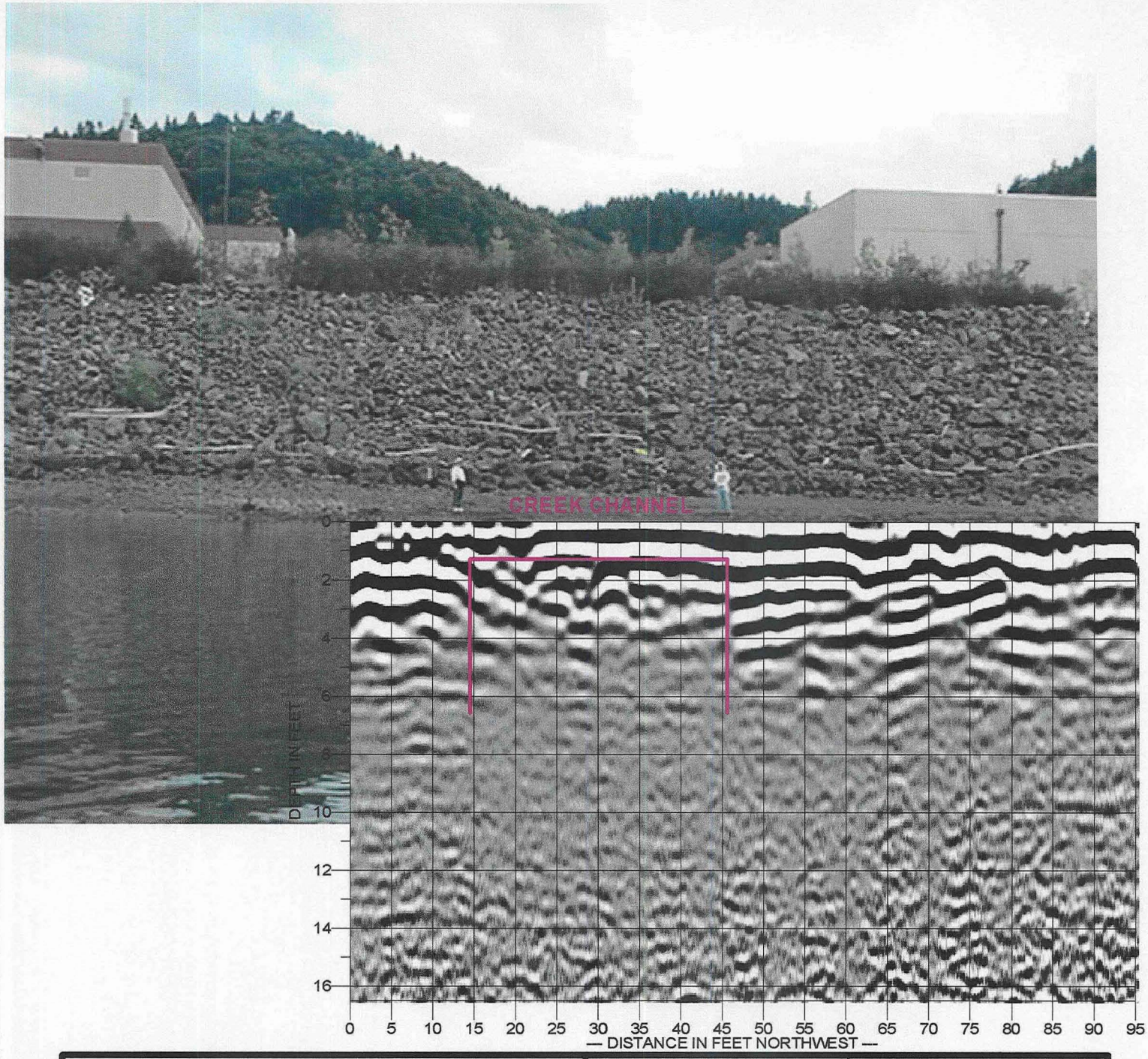
Geophysical surveys consist of interpreting geophysical responses from subsurface features. Since a variety of subsurface features can produce identical geophysical responses it is necessary to confirm the geophysical interpretation with intrusive investigations such as excavating or drilling. In addition many subsurface features may produce no geophysical response. The use of this SUBSURFACE MAPPING SURVEY is the sole responsibility of the CLIENT.

Ralph Soule

**RALPH SOULE** **August 25, 2001**
**GeoPotential**



SCOEPA00010388




GeoPotential
ENVIRONMENTAL & EXPLORATION GEOPHYSICS
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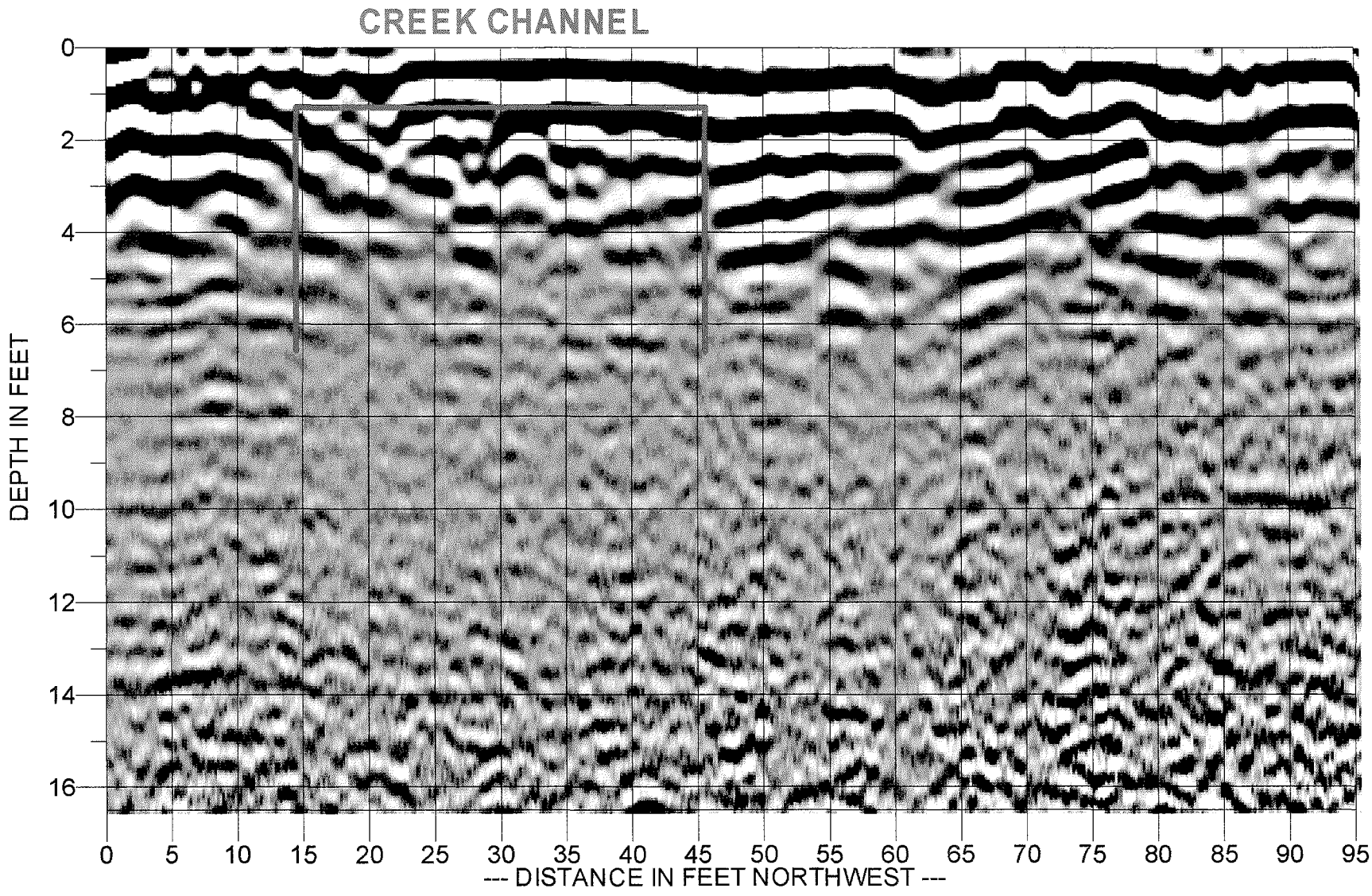
E-MAIL GeoPotential@aol.com

LOCATION: Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Figure 1
GPR PROFILE 12

DATE: AUGUST , 2001 SUBSURFACE MAPPING SURVEY PROJECT No. 3847 CLIENT: HAHN AND ASSOCIATES

SCOEPA00010389

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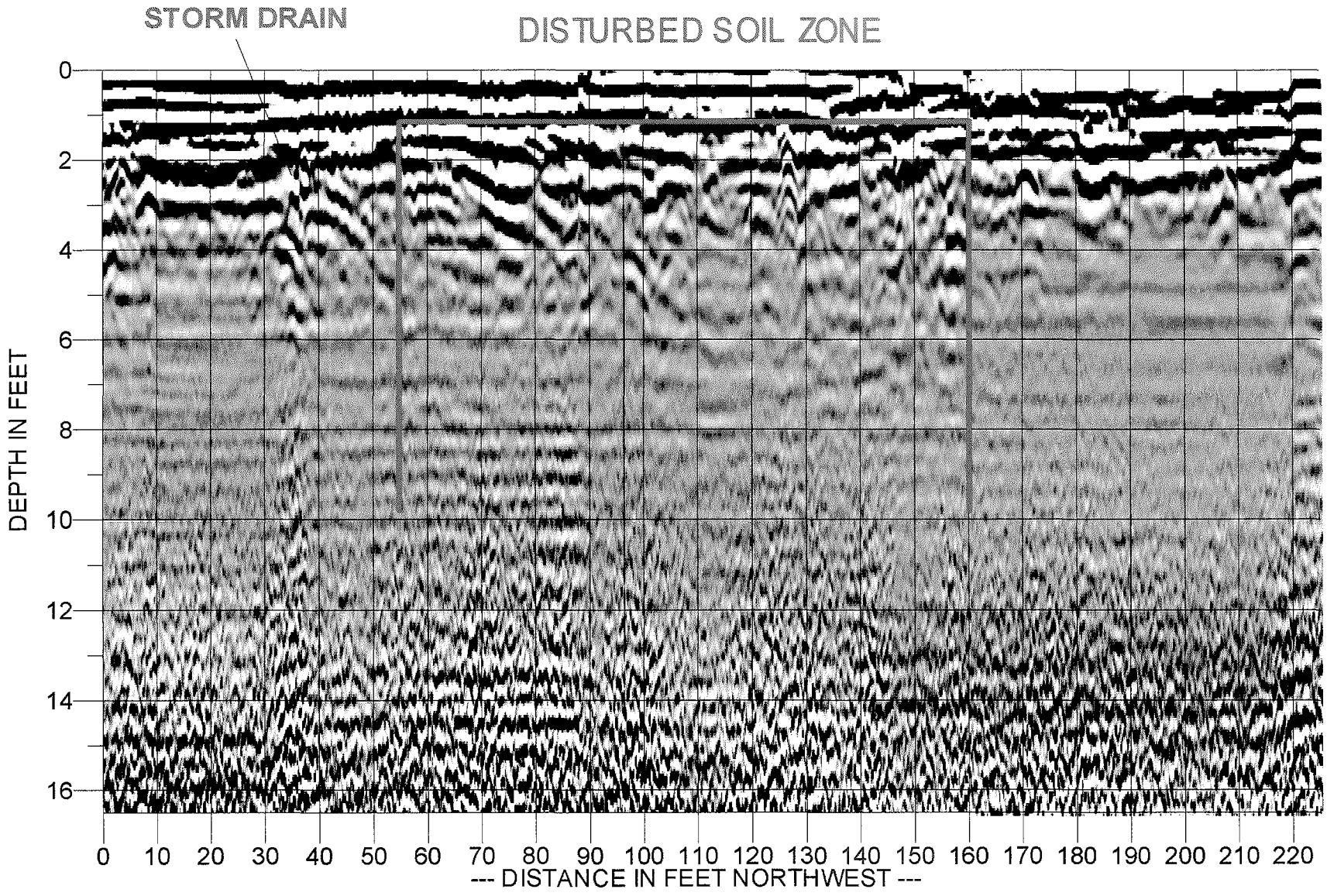
DATE: AUGUST , 2001 SUBSURFACE MAPPING SURVEY PROJECT No. 3847

LOCATION:
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

CLIENT: HAHN AND ASSOCIATES

Figure 1
GPR PROFILE

SCOEPA00010390

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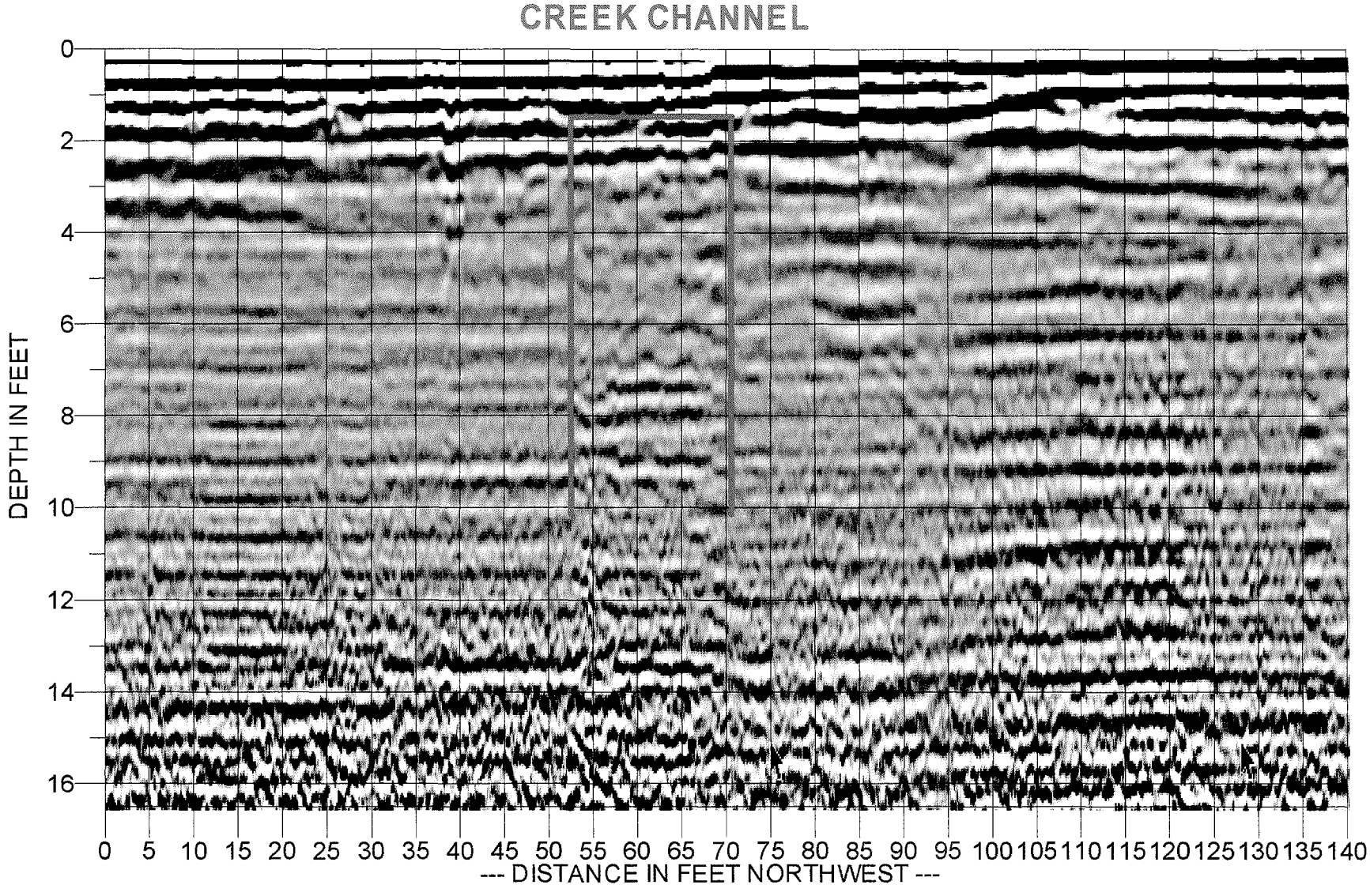
DATE: AUGUST , 2001 SUBSURFACE MAPPING SURVEY PROJECT No. 3847

LOCATION:
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

CLIENT: HAHN AND ASSOCIATES

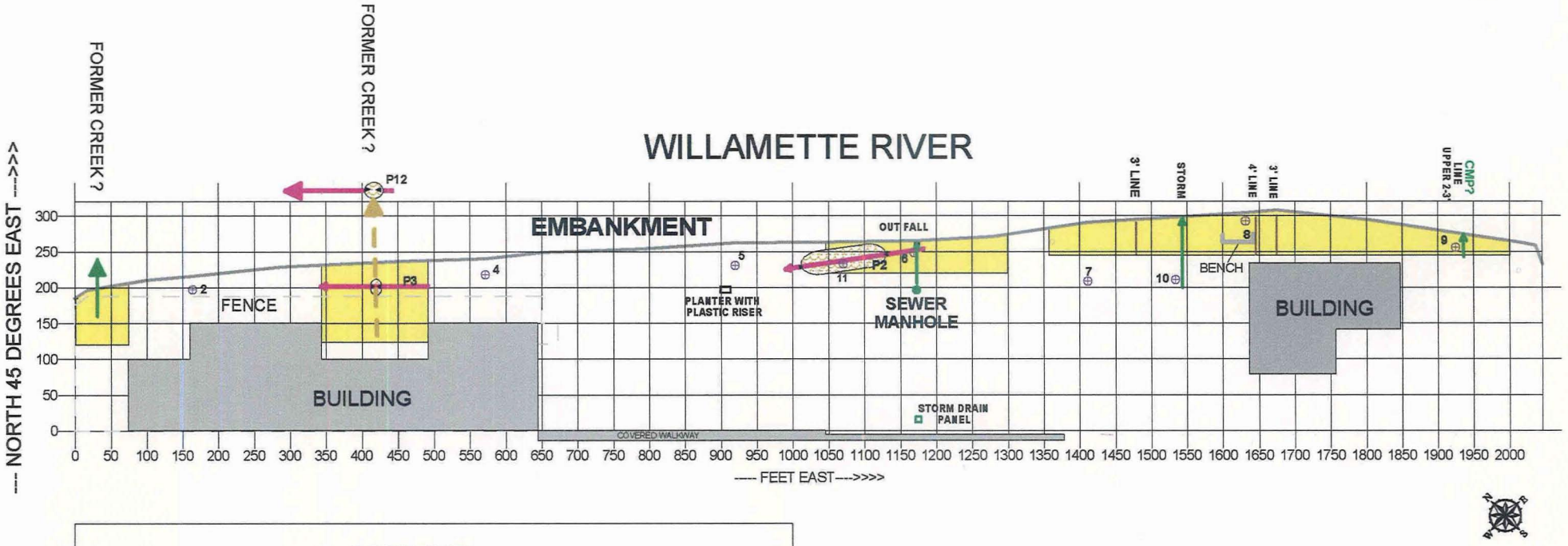
Figure 2
GPR PROFILE 2

SCOEPA00010391




| | | |
|---|---|---|
| GeoPotential<br>ENVIRONMENTAL & EXPLORATION GEOPHYSICS<br>437 N.E. LIBERTY AVE. GRESHAM, OR 97030 • PH (503) 665-7520 • FAX (503) 492-4404<br>E-MAIL GeoPotential@aol.com | LOCATION:<br>Wacker Siltronic Corporation<br>7200 NW Front Avenue<br>Portland, Oregon | Figure 3<br>GPR PROFILE 3 |
| DATE: AUGUST , 2001 SUBSURFACE MAPPING SURVEY PROJECT No. 3847 | CLIENT: HAHN AND ASSOCIATES | |

SCOEPA00010392




## LEGEND

- GPR PROFILE
- DISTURBED SOIL ZONE
- GPR SURVEY
- SITTING AREA
- BORE HOLE

GeoPotential
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E-MAIL GeoPotential@aol.com

DATE: August 23, 2001 | *SUBSURFACE MAPPING SURVEY* | PROJECT No. 3847

LOCATION: Wacker Siltronic Corporation, 7200 NW Front Avenue, Portland, Oregon

CLIENT: HAHN AND ASSOCIATES

**Figure 4.**

**SITE MAP**

## APPENDIX

## GROUND PENETRATING RADAR SURVEYS

Ground Penetrating Radar (GPR) uses high frequency radio waves directed into the ground to acquire information about the subsurface. The energy radiated into the ground is reflected back to the antenna by features having significantly different electrical properties to that of the surrounding material. The greater the contrast, the stronger the reflection. Typical reflectors include water table, bedrock, bedding, fractures, voids, contaminant plumes and man-made objects such as UST's and utilities. Real-time data are printed on paper records and may also be displayed on a color monitor. Field data may be digitally recorded for later playback, processing and color plotting.

GPR can be a valuable tool to accurately locate both metallic and non-metallic UST's and utilities; buried drums and hazardous material even below reinforced concrete floors and slabs. GPR can delineate trenches and excavations and, under some conditions, it can be used to locate contaminant plumes. It has been used as an archaeological tool to look for buried artifacts. It can accurately profile fresh water lake bottoms either from a boat or from a frozen lake surface. GPR can locate voids below roads and runways. GPR has numerous engineering applications. It can be used in non-destructive testing of engineering material, for example, locating rebar in concrete structures and determining the thickness of concrete and other structural material.

### ADVANTAGES

GPR provides continuous records along traverses which, depending on the goal of the survey, may be interpreted in the field.

In clean, dry, sandy soil, reflections from targets as deep as 100 feet are possible.

At flat, open sites, for reconnaissance purposes, the antenna can be towed behind a vehicle at several mph.

Many GPR antennas are shielded and are unaffected by surface and overhead objects and power lines.

The resolution of data is very high particularly for high frequency antennas.

- GPR can be used in conjunction with magnetic or EM surveys to accurately locate buried objects.
- Under adverse site conditions, shallow, man-made objects generally can be detected.
- Fiberglass UST's can be detected using GPR.

### LIMITATIONS

Penetration of the GPR signal is "site specific" and its depth of penetration at a particular site cannot be predicted ahead of time. Near surface conductive material, such as salty or contaminated ground water and wet, clay-rich soil, may attenuate the radar signal, limiting the effective depth of the survey to several feet.

- Adequate contrast between the ground and the target is required to obtain reflections. UST's may be missed if they are badly corroded.

To determine the depth to an object without "ground truth", assumptions must be made regarding soil properties.

GPR may not be cost-effective for some projects. For a detailed survey mapping underground storage tanks and utilities, it may be necessary to collect data in orthogonal directions at 5-foot line spacing.

To acquire the highest quality data, proper coupling between the antenna and the ground surface is necessary. Poor data may be obtained at sites covered with tall grass and brush.

Oregon
John A. Kitzhaber, M.D., Governor

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February 6, 2002

Mr. Bob Wyatt
Northwest Natural
220 NW Second Avenue
Portland, OR 97209

Ms. Cathryn Young
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, OR 97210

Re: Focused Remedial Investigation
Wacker Siltronic Corporation Property

Dear Bob and Cathryn:

On January 7, 2002, the Oregon Department of Environmental Quality (DEQ) provided comments on the Data Package for Focused Remedial Investigation for the Wacker Siltronic Corporation (Wacker) property. In addition to contaminants likely associated with the former GASCO site, the focused remedial investigation identified the presence of trichloroethene (TCE) and its breakdown products in groundwater at the Wacker site. Although the source of the TCE has not been determined, the 1984 TCE spill area and areas at the Wacker site where TCE was stored or otherwise managed have been identified as potential source areas. Recently, Wacker Siltronic Corporation has expressed a desire to investigate the nature and extent of TCE releases at the Wacker site. This information will be used by DEQ to determine whether they are adversely effecting the Willamette River or otherwise represent a threat to human health or the environment.

DEQ requests that Wacker and Northwest Natural coordinate the additional investigative activities identified in my January 7, 2002 letter and jointly submit a RI work plan addendum to DEQ. This RI work plan addendum must be submitted within 30 days of the date of this letter. This represents an extension of 30 days from my previous letter. This extension should be adequate to develop a comprehensive approach that addresses DEQ comments on the focused RI data package and outlines respective roles and responsibilities. If it is not possible to develop a joint RI work plan addendum within the 30 day time-period, individual RI work plan addendums may also be submitted.

DEQ recognizes that a meeting between Northwest Natural, Wacker Siltronic Corporation and DEQ may facilitate the submittal of the work plan addendum. Please contact me at (503) 229-5648 to schedule a meeting or if you have any questions regarding this matter.



SCOEPA00010395

Sincerely,

Eric L. Blischke
Project Manager
Voluntary Cleanup and Portland Harbor Section

cc: Mike Rosen, NWR/DEQ
Kurt Burkholder, DOJ
Rod Struck, NWR/DEQ
Jennifer Peterson NWR/DEQ

Oregon
John A. Kitzhaber, M.D., Governor

**Department of Environmental Quality**
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December 21, 2001

Mr. Bob Wyatt
Northwest Natural
220 NW Second Avenue
Portland, OR 97209

Re: Phase I RI Extension
Wacker Siltronic Corporation Property

Dear Bob:

By letter dated October 23, 201, DEQ granted a 60 day extension for the completion of the Phase I remedial investigation at the Wacker Siltronic Corporation Property (Wacker) site. However, due to site access issues, investigation of the drainage ditch along the south side of the Wacker property has not been completed. In addition, preliminary review of the Phase I groundwater data suggests that the upgradient monitoring well location proposed in the Phase I RI work plan may not be appropriate. As a result, Phase I RI characterization activities will not be completed before December 24, 2001 as specified in my October 23rd letter. DEQ hereby grants a 60 day extension to resolve site access issues and determine whether it is appropriate to install the upgradient monitoring wells as part of the Phase I RI. Please notify DEQ once site access necessary for evaluation of the drainage ditch has been obtained.

Please contact me at (503) 229-5648 if you have any questions regarding this matter.

Sincerely,

Eric L. Blischke
Project Manager
Voluntary Cleanup and Portland Harbor Section

cc: Mike Rosen, NWR/DEQ
Rod Struck, NWR/DEQ
Jennifer Peterson NWR/DEQ
Cathryn Young, Wacker Siltronic Corporation



SCOEPA00010397

41

Oregon
John A. Kitzhaber, M.D., Governor

Department of Environmental Quality
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November 20, 2001

Mr. Bob Wyatt
Northwest Natural
220 NW Second Avenue
Portland, OR 97209

Re: WS-8 Monitoring Well Installation
Wacker Siltronic Corporation Property

Dear Bob:

The Oregon Department of Environmental Quality (DEQ) has reviewed the information submitted on your behalf by Hahn and Associates regarding the installation of the WS-8 monitoring well cluster. These documents include the Data Package for Boring P-3 and WS-8 Series Wells (October 5, 2001) and the WS-8 monitoring well cluster data summary (November 6, 2001). The purpose of DEQ's review was to determine whether the WS-8 monitoring wells were installed in accordance with the DEQ approved work plan (June 1, 2001).

A GeoProbe® investigation was performed along the Willamette River to select monitoring well locations at the Wacker Siltronic Corporation Property. Two monitoring wells were installed near the location of GeoProbe® boring P-3 due to the detection of petroleum hydrocarbons and chlorinated volatile organic chemicals in groundwater. WS-8-33 was installed in fill material immediately above a silt layer. WS-8-59 was installed in alluvial deposits present below the silt layer.

In the November 6, 2001 data summary, Hahn and Associates requested written concurrence from DEQ that monitoring wells WS-8-33 and WS-8-59 were completed in accordance with the DEQ approved Remedial Investigation Work Plan. At issue is whether a surface casing to prevent the downward migration of contamination through the silt unit was required during the installation of WS-8-59. The DEQ approved sampling and analysis plan states "*If a boring is to be installed through a shallow zone of residual oil product or DNAPL, and the boring will extend through a potential silt or clay confining unit into an underlying zone, then a temporary protective casing will be installed.*" Representatives of Wacker Siltronics Corporation have contended that NAPL was present above the silt unit necessitating the use of a temporary well casing. Representatives of Northwest Natural contend that no residual oil product or dense non-aqueous phase product (DNAPL) was encountered and, as a result, a protective well casing was not required.

DEQ has reviewed the soil and groundwater data collected from the P-3 GeoProbe® boring as well as groundwater data collected from monitoring wells WS-8-33 and WS-8-59. The boring



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log from the P-3 GeoProbe® boring notes the presence of petroleum stained soil that exhibits a sheen when mixed with water just above the silt unit. However, there is no evidence to suggest that residual oil or DNAPL is present. The groundwater sample collected from the P-3 GeoProbe® boring identified the presence of naphthalene at 0.933 mg/l just above the silt unit. Based on naphthalene solubility of 30 mg/l, this concentration is less than 10% of solubility (concentrations at or above 10% of solubility are a generally accepted indicator of the potential presence of free product). The maximum benzene concentration detected above the silt unit (0.107 mg/l) is more than five orders of magnitude below its estimated solubility of 1,780 mg/l.

Groundwater data collected below the silt unit detected relatively low levels of petroleum related contaminants and elevated levels of cis-1,2-dichloroethene and vinyl chloride. Cis-1,2-dichloroethene and vinyl chloride were not detected in soil or groundwater above the silt unit. Groundwater data collected from the P-3 Geoprobe® boring and the WS-8 monitoring well cluster are similar in both the constituents and concentrations detected at both depths. This similarity suggests that the wells are providing representative water quality data and that the drilling method does not appear to have adversely affected the quality of the alluvial sand water bearing zone.

Based on the data provided to DEQ by Northwest Natural, it does not appear that residual oil product or DNAPL was encountered during the installation of the WS-8 monitoring well cluster. Moreover, a comparison of the groundwater data collected above and below the silt units suggests that contaminant migration though the silt unit did not occur during monitoring well installation. As a result, DEQ has determined that the monitoring wells were installed in a manner consistent with the DEQ approved work plan. However, DEQ will continue to evaluate groundwater results from the WS-8 monitoring well cluster to further evaluate the potential for contaminant migration through the silt unit as a result of monitoring well installation activities.

Please contact me at (503) 229-5648 if you have any questions regarding this matter.

Sincerely,

Eric L. Blischke
Project Manager
Voluntary Cleanup and Portland Harbor Section

cc: Mike Rosen, NWR/DEQ
Rod Struck, NWR/DEQ
Angie Obery, WR/DEQ (Eugene)
Kurt Burkholder, DOJ
Rob Ede, Hahn and Associates, Inc.
Cathryn Young, Wacker Siltronic Corporation

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Please contact me at (503) 229-5648 if you have any questions regarding this matter.

Sincerely,

Eric L. Blischke
Project Manager
Voluntary Cleanup and Portland Harbor Section

cc: Mike Rosen, NWR/DEQ
Rod Struck, NWR/DEQ
Angie Obery, WR/DEQ (Eugene)
Kurt Burkholder, DOJ
Rob Ede, Hahn and Associates, Inc.
Cathryn Young, Wacker Siltronic Corporation

Oregon
John A. Kitzhaber, M.D., Governor

Department of Environmental Quality
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November 20, 2001

Mr. Bob Wyatt
Northwest Natural
220 NW Second Avenue
Portland, OR 97209

Re: WS-8 Monitoring Well Installation
Wacker Siltronic Corporation Property

Dear Bob:

The Oregon Department of Environmental Quality (DEQ) has reviewed the information submitted on your behalf by Hahn and Associates regarding the installation of the WS-8 monitoring well cluster. These documents include the Data Package for Boring P-3 and WS-8 Series Wells (October 5, 2001) and the WS-8 monitoring well cluster data summary (November 6, 2001). The purpose of DEQ's review was to determine whether the WS-8 monitoring wells were installed in accordance with the DEQ approved work plan (June 1, 2001).

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In the November 6, 2001 data summary, Hahn and Associates requested written concurrence from DEQ that monitoring wells WS-8-33 and WS-8-59 were completed in accordance with the DEQ approved Remedial Investigation Work Plan. At issue is whether a surface casing to prevent the downward migration of contamination through the silt unit was required during the installation of WS-8-59. The DEQ approved sampling and analysis plan states "*If a boring is to be installed through a shallow zone of residual oil product or DNAPL, and the boring will extend through a potential silt or clay confining unit into an underlying zone, then a temporary protective casing will be installed.*" Representatives of Wacker Siltronics Corporation have contended that NAPL was present above the silt unit necessitating the use of a temporary well casing. Representatives of Northwest Natural contend that no residual oil product or dense non-aqueous phase product (DNAPL) was encountered and, as a result, a protective well casing was not required.

DEQ has reviewed the soil and groundwater data collected from the P-3 GeoProbe® boring as well as groundwater data collected from monitoring wells WS-8-33 and WS-8-59. The boring



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**********
*** TX REPORT ***
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TRANSMISSION OK

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| ST. TIME | 11/30 17:20 | |
| USAGE T | 00'48 | |
| PGS. SENT | 3 | |
| RESULT | OK | |

**Wacker Siltronic Corporation**

7200 NW Front Avenue, MS 30
Portland, Oregon 97210-3676
Phone: (503) 219-7406

# FACSIMILE TRANSMITTAL SHEET

**DATE:** November 30, 2001

**TO:** Chris Reive
Tarlow Jordan & Schrader

**PHONE:** (503) 598-5544
**FAX:** (503) 598-7373

**FROM:** Cathryn Young

**PHONE:** (503) 219-7406
**FAX:** (503) 219-7599

**TO:** Kathi Futornick
Limno-Tech, Inc.

**PHONE:** (503) 248-1768
**FAX:** (503) 248-1959

**NUMBER OF PAGES (including this page):** 3

**MESSAGE:**

Letter from Bob Wyatt dated November 20, 2001, regarding WS-8 Monitoring Well Installation, WSC Property.

**********
*** TX REPORT ***
**********

TRANSMISSION OK

| | |
|---|---|
| TX/RX NO | 3269 |
| CONNECTION TEL | 95032481959 |
| CONNECTION ID | |
| ST. TIME | 11/30 17:22 |
| USAGE T | 01'30 |
| PGS. SENT | 3 |
| RESULT | OK |

**Wacker Siltronic Corporation**

7200 NW Front Avenue, MS 30
Portland, Oregon 97210-3676
Phone: (503) 219-7406

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**TO:** Chris Reive
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**PHONE:** (503) 598-5544
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**TO:** Kathi Futornick
Limno-Tech, Inc.

**PHONE:** (503) 248-1768
**FAX:** (503) 248-1959

**NUMBER OF PAGES (including this page):** 3

**MESSAGE:**

Letter from Bob Wyatt dated November 20, 2001, regarding WS-8 Monitoring Well Installation, WSC Property.

42

**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL CONSULTANTS

October 9, 2001

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland, OR 97201-4987

HAI Project No. 5237

Subject: Access for Completion of Focused Remedial Investigation Activities: Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. Blischke:

As you are aware, Wacker Siltronic Corporation (Wacker) has denied us access to its property for well installation activities in connection with the focused remedial investigation that we have been conducting on behalf of NW Natural in response to the Oregon Department of Environmental Quality (ODEQ) unilateral order in connection with this site. Ostensibly, this denial is based on (a) our alleged failure to give Wacker advance notice of entry for site work conducted on the afternoon of September 19th, 2001, and (b) Wacker's concerns with respect to well WS-8-59 (See Mr. Reive's letter of October 2, 2001, a copy of which was sent to you).

For the record, Hahn and Associates, Inc. (HAI) did indeed request and receive permission to enter onto Wacker's property. Please see the attached copy of e-mail correspondence (dated September 18, 2001) between HAI and Ms. Cathryn Young of Wacker. As to the well installation issue, you should have received under separate cover a Data Summary Package in support of our position that the installation and sampling of this well were performed properly and in accordance with the Work Plan. A copy of the Data Summary Package was also provided to Wacker.

The delay in obtaining access to the Wacker property will preclude us from meeting the deadlines for completion of the next steps in the Work Plan and submittal of associated deliverables. Under these circumstances, we respectfully request that our deadlines be extended as necessary to compensate for these delays.

Thank you for your assistance and cooperation, and you may call me at 503-796-0717 if you would like to discuss this in more detail.

Sincerely,

Robert Ede, R.G.

c: Robert J. Wyatt, NW Natural
Richard D. Bach, Stoel Rives LLP
Cathryn Young, Wacker Siltronic Corporation

attachment (1)

434 NW 6th AVENUE, SUITE 203 • PORTLAND, OREGON 97209-3651
503/796-0717 OFFICE • 503/227-2209 FAX
www.hahnasoc.com

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(43)

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John A. Kitzhaber, M.D., Governor

Department of Environmental Quality
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October 3, 2001

Mr. Bob Wyatt
Northwest Natural
220 NW Second Avenue
Portland, OR 97209

Re: Investigation Derived Waste – Wacker Siltronic Corporation Property

Dear Bob:

Northwest Natural has requested written confirmation from the Oregon Department of Environmental Quality (DEQ) regarding management and transport of investigation derived waste (IDW) generated during the focused Remedial Investigation underway at the Wacker Siltronic Corporation facility. It is our understanding that all IDW generated by Northwest Natural at the Wacker property will be brought back to the adjacent GASCO facility for storage, management and hazardous waste characterization. DEQ agrees that this approach is the most protective and secure method for managing IDW generated at the Wacker property. Provided the IDW is under the control of Northwest Natural and its contractor at all times during its generation, containerization and transport to the adjacent GASCO facility for consolidation and shipment, DEQ will consider Northwest Natural to have complied with 40 CFR 262.20(f). Should any spills or releases occur during transport, Northwest Natural must comply with 40 CFR 263.30 and 263.31.

Please contact me at 229-5648 if you have any questions regarding this matter.

Sincerely,

Eric L. Blischke
Project Manager
Voluntary Cleanup and Portland Harbor Section

cc: Mike Rosen, NWR/DEQ
Chuck Clinton, NWR/DEQ
Cathryn Young, Wacker Siltronic Corporation



SCOEPA00010408

(45)

**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL CONSULTANTS

September 5, 2001

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland OR 97201-4987

HAI Project No. 5237

SUBJECT: Preliminary Groundwater Data and Hydrogeologic Cross-Section, for Focused Remedial Investigation (RI) Activities; Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. Blischke:

As you are aware, efforts are being made to expedite the well installation component of RI activities at the Wacker Siltronic Corporation (Wacker) property such that drilling may proceed during a plant shut-down scheduled for the week of September 10, 2001. To facilitate the above schedule, and as per our telephone conversation of September 4, 2001, Hahn and Associates, Inc. (HAI) is submitting four copies of preliminary groundwater quality data, as well as a preliminary hydrogeologic cross-section, generated during the recently completed push probe phase of investigatory activities. It is hoped that review of these data in advance of our September 7 meeting to discuss well placements will be of assistance to you.

If you have any questions regarding the enclosed data, please do not hesitate to contact me at 503-796-0717.

Sincerely,

Robert Ede, R.G.
Associate

rede@hahnasoc.com

c: Mr. Bob Wyatt, NW Natural
Mr. Richard Bach, Stoel Rives LLP
Mr. Carl Stivers, Anchor Environmental, LLC
Ms. Cathryn Young, Wacker Siltronic Corporation

**TABLE 1**
**Summary of Preliminary Analytical Results for Groundwater Samples: Temporary Well Points**
**Detected Volatile Organic Compounds by EPA Method 8260**

Source Control Evaluation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Well Point Location | HAI Sample Number | Sample Date | Screen Interval | Analytical Results – ug/l (ppb) VOCs by EPA Method 8260 | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Aromatic VOCs (AVOCs) | | | | | | | | | Halogenated VOCs (HVOCs) | | | | | | |
| | | | (feet bgs) | Benzene | Ethylbenzene | Toluene | Xylene | Naphthalene | Chlorobenzene | 1,2-DCB | 1,3-DCB | 1,4-DCB | cis-1,2-DCE | trans-1,2-DCE | TCE | Vinyl Chloride | Other VOCs | Total AVOCs | Total HVOCs |
| P-2 | 5237-010816-316 | 16-Aug-01 | 28-32 | 61.2 | ND> 1. | ND> 1. | 2.3 | 2.6 | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | 66.1 | ND |
| | 5237-010816-317 | 16-Aug-01 | 54-58 | 2.1 | ND> 1. | ND> 1. | ND> 2. | 2.99 | ND> 1. | ND> 1. | ND> 1. | ND> 1. | 6.4 | ND> 1. | ND> 1. | ND> 1.2 | ND | 5.1 | 6.4 |
| | 5237-010816-318 | 16-Aug-01 | 96-100 | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| P-3 | 5237-010821-321 | 21-Aug-01 | 28.5-32.5 | **104.** | 29.9 | ND> 10. | 22.3 | **933.** | ND> 10. | ND> 10. | ND> 10. | ND> 10. | ND> 10. | ND> 10. | ND> 10. | ND> 12. | 1,2,4-TMB = 23.6 | 1,089.2 | ND |
| | 5237-010821-323 | 21-Aug-01 | 55-59 | 23.6 | ND> 10. | ND> 10. | ND> 10. | 53.7 | ND> 10. | ND> 10. | ND> 10. | ND> 10. | 312. | ND> 10. | ND> 10. | 212. | ND | 77.3 | 524. |
| | 5237-010821-325 | 21-Aug-01 | 96-100 | 21.5 | ND> 1. | ND> 1. | ND> 1. | 5.82 | ND> 1. | ND> 1. | ND> 1. | ND> 1. | 5.99 | ND> 1. | ND> 1. | 21.2 | ND | 27.3 | 27.2 |
| P-4 | 5237-010815-309 | 15-Aug-01 | 28-32 | 12. | ND> 1. | ND> 1. | ND> 2. | 2.99 | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | 15. | ND |
| | 5237-010815-310 | 15-Aug-01 | 50-54 | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | 453. | 4.32 | 33.3 | 29.6 | ND | ND | 520.2 |
| P-5 | 5237-010815-311 | 15-Aug-01 | 29-33 | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| (duplicate) | 5237-010815-312 | 15-Aug-01 | 29-33 | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| | 5237-010815-313 | 15-Aug-01 | 52-56 | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | 1.33 | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | 1.3 |
| | 5237-010815-314 | 15-Aug-01 | 96-100 | ND> 1. | ND> 1. | ND> 1. | ND> 2. | 16.6 | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | 16.6 | ND |
| P-6 | 5237-010802-300 | 2-Aug-01 | 32-36 | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| | 5237-010802-301 | 2-Aug-01 | 46-50 | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| P-7 | 5237-010809-307 | 9-Aug-01 | 56-62 | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| P-8 | 5237-010809-304 | 9-Aug-01 | 28-32 | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| | 5237-010809-305 | 9-Aug-01 | 50-54 | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| | 5237-010809-306 | 9-Aug-01 | 80-84 | 11.1 | ND> 10. | ND> 10. | ND> 20. | ND> 20. | 199. | 425. | 15.1 | 155. | ND> 10. | ND> 10. | ND> 10. | 21.1 | ND | 805.2 | 21.1 |
| P-9 | 5237-010816-320 | 16-Aug-01 | 31-35 | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| Quality Control Samples | | | | | | | | | | | | | | | | | | | |
| Trip Blank | 5237-010802-302 | 2-Aug-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| Trip Blank | 5237-010809-303 | 9-Aug-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| Trip Blank | 5237-010815-308 | 15-Aug-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| Trip Blank | 5237-010816-315 | 16-Aug-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| Trip Blank | 5237-010821-322 | 21-Aug-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| Water EB | 5237-010816-319 | 16-Aug-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| Soil EB | 5237-010821-324 | 21-Aug-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | 71. [3] | 29,000. [3] | 200,000. [3] | 10,000. [4] | 620. [4] | 21,000. [3] | 17,000. [3] | 2,600. [3] | 2,600. [3] | 11,600. [4] | 140,000. [3] | 81. [3] | 525. [3] | # | # | # |

Note:
# = not established
AVOCs = aromatic volatile organic compounds
bgs = below ground surface
DCB = dichlorobenzene
DCE = dichloroethene
EB = equipment blank
EPA = U.S. Environmental Protection Agency
HVOCs = halogenated volatile organic compounds
ND = not detected above detection limit indicated
ppb = parts per billion
TCE = trichloroethene
TMB = trimethylbenzene
ug/l = micrograms/liter
VOCs = volatile organic compounds

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC
4 = Reference Level based on Lowest Observable Health Effect Level for Freshwater, as provided within NOAA Screening Quick Reference Tables, updated September 1999

**Bold** = Detected above lowest identified AWQC

**TABLE 2**
**Summary of Preliminary Analytical Results for Groundwater Samples: Temporary Well Points**
**Polynuclear Aromatic Hydrocarbons by EPA Method 8270 SIM or 8270C**

Source Control Evaluation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| PAHs by EPA Method 8270 (SIM) | | | | Analytical Results ug/l (ppb) | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Carcinogenic PAHs | | | | | | | Non-carcinogenic PAHs | | | | | | | | | | | |
| Well Point Location | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Benzo (a) anthracene | Benzo (b) fluoranthene | Benzo (k) fluoranthene | Benzo (a) pyrene | Chrysene | Dibenzo (ah) anthracene | Indeno (1,2,3-cd) pyrene | Acenaphthene | Acenaphthylene | Anthracene | Benzo (ghi) perylene | Fluoranthene | Fluorene | Naphthalene | Phenanthrene | Pyrene | Total PAHs |
| P-2 | 5237-010816-316 | 16-Aug-01 | 28-32 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND |
| | 5237-010816-317 | 16-Aug-01 | 54-58 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | 52.1 | ND> 2. | 2.9 | ND> 2. | 4.7 | 16.4 | ND> 2. | 12. | 5.2 | 93.3 |
| | 5237-010816-318 | 16-Aug-01 | 96-100 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | 8.1 | ND> 2. | 2.8 | ND> 2. | 5.7 | 3.6 | 5.8 | 20. | 5.6 | 51.6 |
| P-3 | 5237-010821-321 | 21-Aug-01 | 28.5-32.5 | **4.2** | **2.12** | ND> 2. | **4.23** | **5.34** | ND> 2. | ND> 2. | 62. | ND> 2. | 19.1 | 2.51 | 26.8 | 43. | 214. | 88.3 | 28. | 499.6 |
| | 5237-010821-323 | 21-Aug-01 | 55-59 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | 3.41 | ND> 2. | ND> 2. | ND> 2. | 2.48 | ND> 2. | 4.72 | 8.69 | 2.45 | 21.8 |
| | 5237-010821-325 | 21-Aug-01 | 96-100 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | 7.56 | ND> 2. | 2.94 | ND> 2. | 5.55 | 3.95 | 12. | 22.8 | 5.41 | 60.2 |
| P-4 | 5237-010815-309 | 15-Aug-01 | 28-32 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | 40.4 | ND> 2. | 4.18 | ND> 2. | 8.16 | 11.9 | 2.96 | 24.6 | 9.61 | 101.8 |
| | 5237-010815-310 | 15-Aug-01 | 50-54 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND |
| P-5 | 5237-010815-311 | 15-Aug-01 | 29-33 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | 6.62 | ND> 2. | ND> 2. | ND> 2. | 3.32 | 3.58 | ND> 2. | 8.16 | 3.29 | 25. |
| (duplicate) | 5237-010815-312 | 15-Aug-01 | 29-33 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | 5.76 | ND> 2. | ND> 2. | ND> 2. | 3.63 | 2.99 | ND> 2. | 7.56 | 3.99 | 23.9 |
| | 5237-010815-313 | 15-Aug-01 | 52-56 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND |
| | 5237-010815-314 | 15-Aug-01 | 96-100 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | 4.69 | ND> 2. | 2.14 | ND> 2. | 3.04 | 2.99 | 19.4 | 14.5 | 3.12 | 49.9 |
| P-6 | 5237-010802-300 | 2-Aug-01 | 32-36 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | 0.47 | ND> 0.1 | ND> 0.1 | ND> 0.1 | 0.29 | 0.18 | 0.91 | 0.65 | 0.27 | 2.8 |
| | 5237-010802-301 | 2-Aug-01 | 46-50 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | 0.15 | 0.16 | ND> 0.1 | 0.3 |
| P-7 | 5237-010809-307 | 9-Aug-01 | 56-62 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND |
| P-8 | 5237-010809-304 | 9-Aug-01 | 28-32 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | 9.4 | ND> 2. | ND> 2. | ND> 2. | 2.8 | 3.1 | ND> 2. | 8.5 | 3.3 | 27.1 |
| | 5237-010809-305 | 9-Aug-01 | 50-54 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND |
| | 5237-010809-306 | 9-Aug-01 | 80-84 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | 2.1 | ND> 2. | 2.1 |
| P-9 | 5237-010816-320 | 16-Aug-01 | 31-35 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND |
| Quality Control Samples | | | | | | | | | | | | | | | | | | | | |
| Trip Blank | 5237-010821-322 | 21-Aug-01 | NA | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND |
| Water EB | 5237-010816-319 | 16-Aug-01 | NA | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND |
| Soil EB | 5237-010821-324 | 21-Aug-01 | NA | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | 0.049 [3] | 0.049 [3] | 0.049 [3] | 0.049 [3] | 0.049 [3] | 0.049 [3] | 0.049 [3] | 2,700. [2] | # | 110,000. [3] | # | 370. [3] | 14,000. [3] | # | # | 11,000. [3] | # |

Note:
# = Reference Level not established
bgs = below ground surface
EB = equipment blank
EPA = U.S. Environmental Protection Agency
ND = not detected above detection limit indicated
PAHs = polynuclear aromatic hydrocarbons
ppb = parts per billion
ug/l = micrograms per liter

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC

**Bold** = Detected above lowest identified AWQC

**TABLE 3**
**Summary of Preliminary Analytical Results for Groundwater Samples: Temporary Well Points**
**Detected Semi-Volatile Organic Compounds by EPA Method 8270C**

Source Control Evaluation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Phenols by EPA Method 8270 | | | | Analytical Results ug/l (ppb) | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Point Location | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Bis 2-ethyl hexyl phthalate | | Butyl benzyl phthalate | | Carbazole | | Dibenzofuran | | 1,2-Dichlorobenzene | | 1,4-dichlorobenzene | | Diethyl phthalate | | Bis (2-chloroisopropyl)ether | | 2-Methylnaphthalene | | PAHs |
| P-2 | 5237-010816-316 | 16-Aug-01 | 28-32 | ND> | 2. | 2. | | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | 8.4 | B | ND> | 2. | See Table 2 |
| | 5237-010816-317 | 16-Aug-01 | 54-58 | ND> | 2. | 2.4 | | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | 10. | B | ND> | 2. | See Table 2 |
| | 5237-010816-318 | 16-Aug-01 | 96-100 | ND> | 2. | 3.4 | | ND> | 4. | | | ND> | 2. | ND> | 2. | ND> | 2. | 11.1 | B | 5.8 | | See Table 2 |
| P-3 | 5237-010821-321 | 21-Aug-01 | 28.5-32.5 | 5.57 | | ND> | 2. | 56.5 | | 6.29 | | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | 82.8 | | See Table 2 |
| | 5237-010821-323 | 21-Aug-01 | 55-59 | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | See Table 2 |
| | 5237-010821-325 | 21-Aug-01 | 96-100 | ND> | 2. | 3.64 | | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | 3.21 | | See Table 2 |
| P-4 | 5237-010815-309 | 15-Aug-01 | 28-32 | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | 17. | B | ND> | 2. | See Table 2 |
| | 5237-010815-310 | 15-Aug-01 | 50-54 | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | 15.9 | B | ND> | 2. | See Table 2 |
| P-5 | 5237-010815-311 | 15-Aug-01 | 29-33 | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | 11.1 | B | ND> | 2. | See Table 2 |
| (duplicate) | 5237-010815-312 | 15-Aug-01 | 29-33 | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | 11.5 | B | ND> | 2. | See Table 2 |
| | 5237-010815-313 | 15-Aug-01 | 52-56 | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | 11. | B | ND> | 2. | See Table 2 |
| | 5237-010815-314 | 15-Aug-01 | 96-100 | ND> | 2. | 3.52 | | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | 12.1 | B | 4.55 | | See Table 2 |
| P-7 | 5237-010809-307 | 9-Aug-01 | 56-62 | ND> | 2. | | | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | 3.9 | | ND> | 2. | ND> | | See Table 2 |
| P-8 | 5237-010809-304 | 9-Aug-01 | 28-32 | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | See Table 2 |
| | 5237-010809-305 | 9-Aug-01 | 50-54 | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | See Table 2 |
| | 5237-010809-306 | 9-Aug-01 | 80-84 | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | 31.1 | | 9.3 | | 5.1 | | ND> | 2. | ND> | 2. | See Table 2 |
| P-9 | 5237-010816-320 | 16-Aug-01 | 31-35 | ND> | 2. | 22.2 | | | 4. | ND> | 2. | ND> | 2. | ND> | 2. | 7.1 | | 10.8 | B | ND> | 2. | See Table 2 |
| Quality Control Samples | | | | | | | | | | | | | | | | | | | | | | | |
| Trip Blank | 5237-010821-322 | 21-Aug-01 | NA | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | See Table 2 |
| Water EB | 5237-010816-319 | 16-Aug-01 | NA | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | 8.1 | B | ND> | 2. | See Table 2 |
| Soil EB | 5237-010821-324 | 21-Aug-01 | NA | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | See Table 2 |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | 5.9 | [3] | 5,200. | [3] | # | | # | | 17,000. | [3] | 2,600. | [3] | 120,000. | [3] | 170,000. | [3] | # | | # | |

Note:
bgs = below ground surface
EB = equipment blank
EPA = U.S. Environmental Protection Agency
ND = Not detected above detection limit indicated
PAHs = polynuclear aromatic hydrocarbons
ppb = parts per billion
ug/l = micrograms/liter

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protectior
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC
B = Analyte detected in the associated Method Blank

**TABLE 4**
**Summary of Preliminary Analytical Results for Groundwater Samples: Temporary Well Points**
**Metals, Cyanide, and Chloride**

Source Control Evaluation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

| Well Point Location | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Analytical Results – mg/l (ppm) Dissolved Metals by EPA Methods 6010, 200.7 and/or 7000 Series | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Antimony | Arsenic | Barium | Cadmium | Chromium | Cobalt | Copper | Iron | Lead | |
| P-2 | 5237-010816-316 | 16-Aug-01 | 28-32 | ND> 0.003 | **0.024** | 0.121 | ND> 0.001 | 0.005 | 0.001 | 0.002 | 99.5 | ND> 0.005 | |
| | 5237-010816-317 | 16-Aug-01 | 54-58 | ND> 0.003 | ND> 0.005 | 0.05 | ND> 0.001 | ND> 0.002 | 0.003 | ND> 0.005 | 26.5 | ND> 0.005 | |
| | 5237-010816-318 | 16-Aug-01 | 96-100 | ND> 0.003 | ND> 0.005 | 0.151 | ND> 0.001 | **0.022** | 0.011 | **0.013** | 71.5 | ND> 0.005 | |
| P-3 | 5237-010821-321 | 21-Aug-01 | 28.5-32.5 | ND> 0.003 | 0.016 | 0.172 | ND> 0.001 | ND> 0.005 | ND> 0.001 | 0.001 | 100. | ND> 0.005 | |
| | 5237-010821-323 | 21-Aug-01 | 55-59 | ND> 0.003 | ND> 0.005 | 0.126 | ND> 0.001 | 0.003 | 0.007 | 0.002 | 40.4 | ND> 0.005 | |
| | 5237-010821-325 | 21-Aug-01 | 96-100 | ND> 0.003 | ND> 0.005 | 0.101 | ND> 0.001 | 0.002 | 0.005 | 0.002 | 46.5 | ND> 0.005 | |
| P-4 | 5237-010815-309 | 15-Aug-01 | 28-32 | ND> 0.003 | 0.008 | 0.149 | ND> 0.001 | ND> 0.002 | 0.002 | ND> 0.005 | 87.5 | ND> 0.005 | |
| | 5237-010815-310 | 15-Aug-01 | 50-54 | ND> 0.003 | ND> 0.005 | 0.105 | ND> 0.001 | ND> 0.002 | 0.003 | ND> 0.005 | 47.3 | ND> 0.005 | |
| P-5 | 5237-010815-311 | 15-Aug-01 | 29-33 | 0.003 | **0.008** | 0.202 | ND> 0.001 | ND> 0.002 | 0.016 | ND> 0.005 | 86. | ND> 0.005 | |
| (duplicate) | 5237-010815-312 | 15-Aug-01 | 29-33 | 0.005 | **0.009** | 0.245 | ND> 0.001 | 0.009 | 0.011 | **0.01** | 100. | **0.019** | |
| | 5237-010815-313 | 15-Aug-01 | 52-56 | 0.004 | **0.011** | 0.352 | ND> 0.001 | **0.129** | 0.046 | **0.089** | 92.7 | **0.008** | |
| | 5237-010815-314 | 15-Aug-01 | 96-100 | 0.022 | **0.034** | 1.08 | ND> 0.001 | **0.61** | 0.134 | **0.327** | 457. | **0.036** | |
| P-6 | 5237-010802-300 | 2-Aug-01 | 32-36 | ND> 0.003 | ND> 0.005 | 0.056 | ND> 0.001 | ND> 0.002 | 0.012 | 0.002 | 3.29 | ND> 0.005 | |
| | 5237-010802-301 | 2-Aug-01 | 46-50 | ND> 0.003 | ND> 0.005 | 0.101 | ND> 0.001 | ND> 0.002 | 0.005 | 0.002 | 19.5 | ND> 0.005 | |
| P-7 | 5237-010809-307 | 9-Aug-01 | 56-62 | ND> 0.005 | ND> 0.005 | 0.229 | ND> 0.002 | ND> 0.005 | 0.006 | ND> 0.005 | 45.2 | ND> 0.005 | |
| P-8 | 5237-010809-304 | 9-Aug-01 | 28-32 | ND> 0.005 | **0.019** | 0.138 | ND> 0.002 | ND> 0.005 | ND> 0.005 | ND> 0.005 | 35.2 | ND> 0.005 | |
| | 5237-010809-305 | 9-Aug-01 | 50-54 | ND> 0.005 | ND> 0.005 | 0.108 | ND> 0.002 | ND> 0.005 | ND> 0.005 | ND> 0.005 | 6.17 | ND> 0.005 | |
| | 5237-010809-306 | 9-Aug-01 | 80-84 | ND> 0.005 | ND> 0.005 | 0.312 | ND> 0.002 | ND> 0.005 | 0.01 | 0.005 | 43.5 | ND> 0.005 | |
| P-9 | 5237-010816-320 | 16-Aug-01 | 31-35 | ND> 0.003 | **0.03** | 0.068 | ND> 0.001 | ND> 0.002 | 0.008 | ND> 0.005 | 13.4 | ND> 0.005 | |
| Quality Control Samples | | | | | | | | | | | | | |
| Trip Blank | 5237-010821-322 | 21-Aug-01 | NA | ND> 0.003 | ND> 0.005 | ND> 0.002 | ND> 0.001 | ND> 0.002 | ND> 0.001 | 0.001 | 0.033 | ND> 0.005 | |
| Water EB | 5237-010816-319 | 16-Aug-01 | NA | ND> 0.005 | ND> 0.005 | ND> 0.002 | ND> 0.002 | ND> 0.005 | ND> 0.005 | ND> 0.005 | 0.086 | ND> 0.005 | |
| Soil EB | 5237-010821-324 | 21-Aug-01 | NA | ND> 0.003 | ND> 0.005 | ND> 0.002 | ND> 0.002 | ND> 0.002 | ND> 0.001 | ND> 0.001 | 0.02 | ND> 0.005 | |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | 4.3 [3] | 0.00014 [3] | # | 0.002 [2] | 0.011 [2] | # [2] | 0.009 [2] | # [2] | 0.003 [2] | |

Note: # = not established
bgs = below ground surface
EB = equipment blank
EPA = U.S. Environmental Protection Agency
mg/l = milligrams/liter
ND = not detected above detection limit indicated
ppm = parts per million

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC

**Bold** = Detected above lowest identified AWQC

**TABLE 4**
**Summary of Preliminary Analytical Results for Groundwater Samples: Temporary Well Points**
**Metals, Cyanide, and Chloride**

Source Control Evaluation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Well Point Location | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Analytical Results – mg/l (ppm) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Dissolved Metals by EPA Methods 6010, 200.7 and/or 7000 Series | | | | | | | | EPA Method 9010 | EPA Method 300 |
| | | | | Magnesium | Manganese | Nickel | Selenium | Silver | Titanium | Vanadium | Zinc | Cyanide | Chloride |
| P-2 | 5237-010816-316 | 16-Aug-01 | 28-32 | 11.7 | 3.63 | 0.019 | ND> 0.005 | ND> 0.002 | 0.078 | 0.005 | 0.072 | **0.723** | 2.25 |
| | 5237-010816-317 | 16-Aug-01 | 54-58 | 32.1 | 0.331 | 0.011 | ND> 0.005 | ND> 0.002 | 0.004 | 0.001 | 0.02 | **0.255** | 26. |
| | 5237-010816-318 | 16-Aug-01 | 96-100 | 37.7 | 4.47 | 0.039 | ND> 0.005 | ND> 0.002 | 0.797 | 0.037 | **0.151** | **0.549** | 24. |
| P-3 | 5237-010821-321 | 21-Aug-01 | 28.5-32.5 | 24.6 | 5.06 | 0.007 | ND> 0.005 | ND> 0.002 | 0.046 | 0.005 | 0.005 | **0.65** | 7. |
| | 5237-010821-323 | 21-Aug-01 | 55-59 | 59.6 | 0.771 | 0.03 | ND> 0.005 | ND> 0.002 | 0.107 | 0.005 | 0.078 | **0.45** | 2. |
| | 5237-010821-325 | 21-Aug-01 | 96-100 | 41.7 | 2.06 | 0.039 | ND> 0.005 | ND> 0.002 | 0.059 | 0.003 | 0.173 | **0.498** | 9.5 |
| P-4 | 5237-010815-309 | 15-Aug-01 | 28-32 | 23.1 | 6.35 | 0.006 | ND> 0.005 | ND> 0.002 | 0.026 | 0.002 | 0.024 | **0.056** | ND> 0.5 |
| | 5237-010815-310 | 15-Aug-01 | 50-54 | 55.5 | 1.28 | 0.037 | ND> 0.005 | ND> 0.002 | 0.01 | 0.001 | 0.09 | **0.071** | ND> 0.5 |
| P-5 | 5237-010815-311 | 15-Aug-01 | 29-33 | 74.9 | 6.11 | 0.047 | ND> 0.005 | ND> 0.002 | 0.012 | 0.002 | 0.008 | **0.35** | 1. |
| (duplicate) | 5237-010815-312 | 15-Aug-01 | 29-33 | 76.8 | 5.52 | 0.019 | ND> 0.005 | ND> 0.002 | 0.158 | 0.009 | 0.083 | **0.122** | 1.75 |
| | 5237-010815-313 | 15-Aug-01 | 52-56 | 82.5 | 1.57 | **0.102** | ND> 0.005 | ND> 0.002 | 3.88 | 0.204 | **0.333** | **0.139** | 0.5 |
| | 5237-010815-314 | 15-Aug-01 | 96-100 | 132. | 9.98 | **0.351** | ND> 0.005 | ND> 0.002 | 11.7 | 0.635 | **1.69** | **0.66** | 33. |
| P-6 | 5237-010802-300 | 2-Aug-01 | 32-36 | 65.4 | 1.92 | 0.012 | ND> 0.005 | ND> 0.002 | 0.01 | 0.003 | 0.025 | ND> 0.02 | 0.75 |
| | 5237-010802-301 | 2-Aug-01 | 46-50 | 51.4 | 0.715 | 0.031 | 0.005 | ND> 0.002 | 0.011 | ND> 0.001 | 0.23 | **0.037** | 1.75 |
| P-7 | 5237-010809-307 | 9-Aug-01 | 56-62 | 30.1 | 6.44 | 0.03 | **0.006** | ND> 0.005 | 0.04 | ND> 0.005 | 0.092 | ND>0.02 | 40.8 |
| P-8 | 5237-010809-304 | 9-Aug-01 | 28-32 | 39.4 | 6.54 | 0.006 | **0.006** | ND> 0.005 | 0.026 | ND> 0.005 | 0.016 | **0.12** | 0.75 |
| | 5237-010809-305 | 9-Aug-01 | 50-54 | 70.3 | 0.542 | 0.022 | ND> 0.005 | ND> 0.005 | 0.012 | 0.009 | **0.136** | **0.18** | ND> 0.5 |
| | 5237-010809-306 | 9-Aug-01 | 80-84 | 152. | 28.9 | **0.061** | **0.016** | ND> 0.005 | 0.101 | ND> 0.005 | **0.307** | ND> 0.02 | 1,000. |
| P-9 | 5237-010816-320 | 16-Aug-01 | 31-35 | 18.9 | 14.5 | 0.005 | **0.006** | ND> 0.002 | 0.012 | 0.001 | 0.014 | 0.034 | 1. |
| Quality Control Samples | | | | | | | | | | | | | |
| Trip Blank | 5237-010821-322 | 21-Aug-01 | NA | ND> 0.025 | ND> 0.025 | ND> 0.003 | ND> 0.005 | ND> 0.002 | ND> 0.001 | ND> 0.001 | 0.009 | **0.022** | |
| Water EB | 5237-010816-319 | 16-Aug-01 | NA | ND> 0.05 | ND> 0.005 | ND> 0.003 | ND> 0.005 | ND> 0.005 | 0.002 | ND> 0.001 | 0.003 | ND> 0.02 | 23.8 |
| Soil EB | 5237-010821-324 | 21-Aug-01 | NA | ND> 0.025 | ND> 0.005 | ND> 0.003 | ND> 0.005 | ND> 0.002 | ND> 0.001 | ND> 0.001 | ND> 0.006 | ND> 0.02 | ND> 0.5 |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | # | # | 0.052 [2] | 0.005 [2] | 0.003 [2] | # | # | 0.12 [2] | 0.005 [2] | # |

Note: # = not established
bgs = below ground surface
EB = equipment blank
EPA = U.S. Environmental Protection Agency
mg/l = milligrams/liter
ND = not detected above detection limit indicated
ppm = parts per million

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC

**Bold** = Detected above lowest identified AWQC



SCOEPA00010415

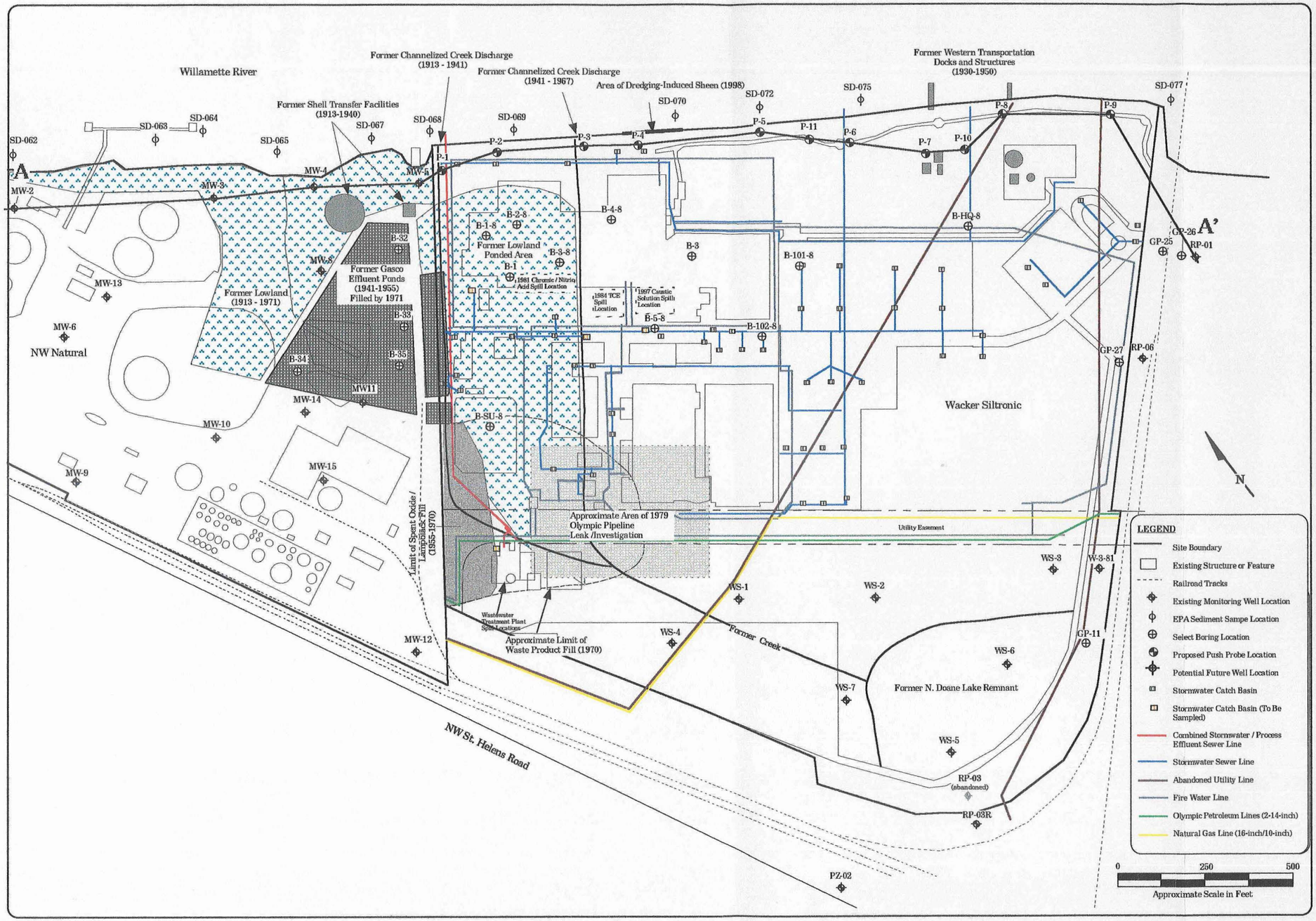


**Figure 1**

**Cross-Section Location Map - Section A-A'**

Remedial Investigation Work Plan
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon


**HAHN & ASSOCIATES, INC.**
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717


**August 2001**

**Project No. 5237**

SCOEPA00010416

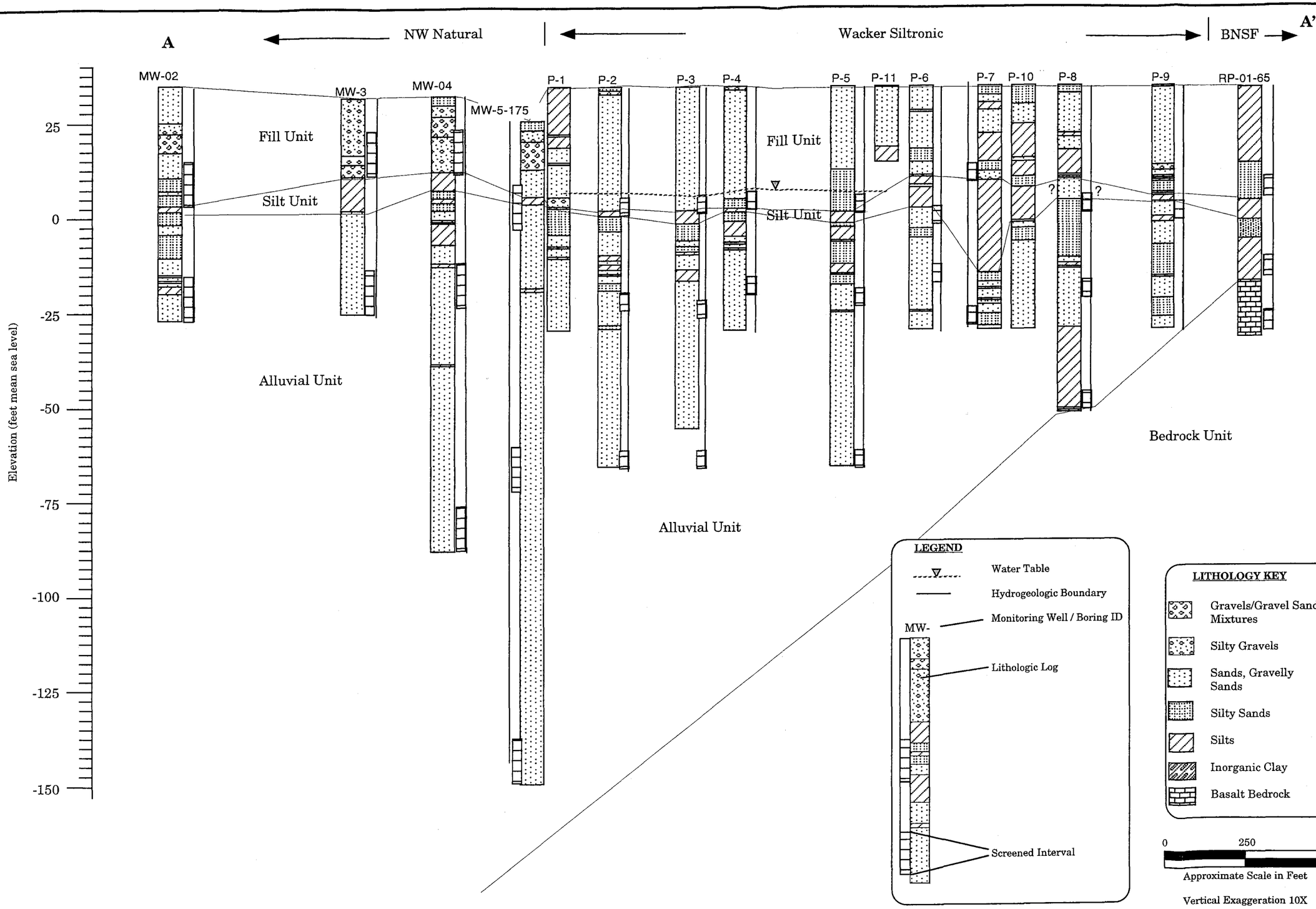


**Figure 2**

**Preliminary Hydrogeologic Cross Section A - A'**

Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon


**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
(503) 796-0717


**August 2001**

**Project No. 5237**

SCOEPA00010417

| PORTLAND (503) 254-3334 | ATLANTA (770) 840-8232 | BOSTON (781) 793-0800 | CHICAGO (847) 928-2600 | HOUSTON (281) 219-0356 | MIAMI (305) 592-1544 | SACRAMENTO (916) 929-2200 | SAN FRANCISCO (650) 777-9910 | SANTA ROSA (707) 665-3888 |
|---|---|---|---|---|---|---|---|---|

| TAG NO. | ACCOUNT NO. | DATE | DRIVER NO. | DRIVER NAME | BILLING INSTRUCTIONS |
|---|---|---|---|---|---|
| 217183 | 469 | 9/5 | 468 | JM | CASH ☐ SHIPPER ☐ RECEIVER ☐ OTHER ☐ |

INVOICE TO: Hahn and Associates, Inc.

CUSTOMER P.O.# / REFERENCE #: Proj. 5237

| SHIPPER NAME | PHONE | RECEIVER NAME | PHONE |
|---|---|---|---|
| Mr. Rob Ede | 503 796-0717 | Ms. Cathryn Young | |
| **COMPANY** | | **COMPANY** | |
| HAHN & ASSOCIATES | | Wacker Siltronic Corp. | |
| **ADDRESS** | | **ADDRESS** | |
| 434 NW 6TH AVE. #203 | | 7200 NW Front Ave. | |
| **CITY/STATE** | **ZIP CODE** | **CITY/STATE** | **ZIP CODE** |
| PORTLAND OR | 97209 | Portland OR | 97210 |

DESCRIPTION/SPECIAL INSTRUCTIONS: NON-STOP @ 10.20

CALLED 4:05 PM 9/5/01

Courier's liability is limited to $150 per shipment unless a greater value is declared below for each shipment and a charge of $.50 per $100 value, to a maximum of $5,000 value, is paid.

SERVICES:

| VEHICLE | BIKE |
|---|---|
| DIRECT ☒ (NON-STOP) | SUPER RUSH ☐ (30 MIN.) |
| RUSH ☐ (90 MIN.) | RUSH ☐ (60 MIN.) |
| ROUTE ☐ (3 HOURS) | ROUTE ☐ ( 3 HOURS) |

| SUBJECT TO CONDITIONS ON REVERSE SIDE | DECLARED VALUE $ | |
|---|---|---|
| PCS. 1 | LBS. 1 | |
| DATE 9/5/01 | TIME 16:30 | |
| DATE | TIME 1640 | |
| DATE | TIME | |

| | |
|---|---|
| DELIVERY CHARGES | |
| ROUND TRIP ADDITIONAL STOPS | |
| WAITING TIME TOTAL | |
| EXTRA LBS. EXTRA BOX | |
| OTHER | |
| AFTER HOURS | |
| WEEKEND HOLIDAY | |
| EXCESS VALUE SURCHARGE | |
| CASH OUTLAY | |
| TOTAL CHARGES | |

SHIPPER'S SIGNATURE X Sharon Moon

RECEIVER SIGNATURE X

PRINT NAME X Canney

WESTERN FLASH
A WORLD COURIER GROUND COMPANY DELIVERY

ISO 9002

RECEIVER

503/254-3334

SCOEPA0010418

amec

FOR YOUR INFORMATION
TARLOW, JORDAN & SCHRADER

May 11, 2001

0-61M-10703-0/Task 43

Eric Blischke
Coordinator, Portland Harbor
Department of Environmental Quality
2020 S.W. 4th Avenue
Portland, Oregon 97201

Dear Mr. Blischke:

**Re: Revised Final Sampling Locations and Analytical Methods**
**Focused Spring 2001 Groundwater Characterization**
**RPAC, Portland Site**

On behalf of Rhône-Poulenc AG Company (RPAC), now known as Aventis CropScience, AMEC Earth & Environmental, Inc. (AMEC) is submitting to the Oregon Department of Environmental Quality (DEQ) four copies of this letter regarding the revised final list of groundwater monitoring wells and analytical testing for the Focused Spring 2001 groundwater characterization event.

The Draft Extended Groundwater Characterization Plan (EGCP) was submitted to DEQ on March 2, 2001. The EGCP identified the monitoring wells proposed for the Focused Spring 2001 Groundwater Characterization event, the laboratory methods to be used for groundwater analysis at the individual monitoring wells, and the reason for selecting the monitoring wells. Groundwater monitoring wells and analytical methods were selected based on historical and recent project groundwater monitoring results. The EGCP described the data quality objectives (DQOs) for the Focused Spring 2001 and Fall 2001 Groundwater Characterization events.

This letter is being submitted in place of a final EGCP and incorporates the results of a meeting with DEQ on April 4, 2001, and a teleconference on April 11, 2001. The anticipated final list of monitoring wells for sampling and analytical methods agreed to during the April 11 teleconference was provided to DEQ in an April 18, 2001 letter. The DEQ suggested changes to the final list in a April 26, 2001 letter. These revisions were made and the agreed upon final water level measurement and groundwater sampling locations and analytical methods for the Spring 2001 event are included in the enclosed Table 1 and Figure 1. As requested in the April 26, 2001 letter from DEQ, Table 1 includes non-aqueous phase liquid (NAPL) measurement results from the Fall 2000 Comprehensive Groundwater Monitoring event.

The Spring 2001 sampling event currently is expected to begin before the end of May 2001 with the initial activities being the water elevation and NAPL thickness measurements. The time required to complete the Focused Spring 2001 Groundwater Characterization event is estimated at 15 business days. The final Revised Quality Assurance Project Plan and Focused Spring 2001 Groundwater Characterization Field Sampling Plan need to be submitted by RPAC and

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Portland, Oregon
USA 97223
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Fax +1 (503) 620-7892

www.amec.com

approved by DEQ before this Spring 2001 groundwater event can begin. RPAC will also submit to DEQ a Revised Health and Safety Plan prior to initiation of these field activities.

If you have any questions, please call Roger Gresh at (503) 639-3400.

Sincerely,

AMEC Earth & Environmental, Inc.

Roger T. Gresh, P.G.
Project Manager

Scott Kranz
Senior Hydrogeologist

Enclosures: Table 1 Revised Final Measurement and Sampling List
Focused Spring 2001 Groundwater Characterization Event

Figure 1 Revised Final Focused Spring 2001 Groundwater Characterization Event Sampling and Measurement Locations

c: R. Ferguson, RPAC
J. Benedict, CHBH&L

RTG/lmp



SCOEPA00010420

**TABLE 1**
Revised Final Measurement and Sampling List
Focused Spring 2001 Groundwater Characterization Event
RPAC - Portland Site

| Location | | NAPL Measurements* | | Measurement and Sampling Requirements | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SITE ID | Property Owner | LNAPL (Inches) | DNAPL (Inches) | Water Elevation Measurement | NAPL Measurement If Present | VOCs by EPA 8260B | Phenols by EPA 8041 | Herbicides by EPA 8151A | Dioxins/ Furans by EPA 8290 | Metals by EPA 6020 | Pesticides by EPA 8081A | Natural Attenuation |
| AL2-17 | RPAC | 0 | 0 | X | X | X | X | X | X | | | X |
| AL2-32 | RPAC | 0 | 0 | X | X | X | X | X | X | X | | X |
| AL2-46 | RPAC | 0 | 0 | X | X | X | X | X | X | | | X |
| AL4-47 | RPAC | 0 | 0 | X | X | | | | | | | |
| AL5-19 | RPAC | 0 | 0 | X | X | | | | | | | |
| AL5-35 | RPAC | 0 | 0 | X | X | | | | | | | |
| AL5-62 | RPAC | 0.03 | 0 | X | X | | | | | | | |
| AL6-96 | RPAC | 0 | 0 | X | X | | | | | | | |
| ASW-01A | Metro | 0 | 0 | X | X | | | | | | X | |
| ASW-04 | Metro | 0 | 0 | X | X | | | | | | | |
| ASW-05 | Metro | 0 | 0 | X | X | | | | | | | |
| ASW-06 | Metro | 0 | 0 | X | X | | | | | | | |
| ASW-07 | Metro | 0 | 0 | X | X | | | | | | | |
| ASW-08 | Metro | 0 | 0 | X | X | | | | | | | |
| BST2W-61 | RPAC | 0 | 0 | X | X | X | X | X | | | | X |
| BST5W-74 | RPAC | 0 | 2 | X | X | | | | | | | |
| BTB-4A-84 | RPAC | 0 | 0 | X | X | | | | | | | |
| BTB-4B-25 | RPAC | 0 | 0 | X | X | | | | | | | |
| BTB-4B-55 | RPAC | 0 | 0 | X | X | | | | | | | |
| KM-MW-2 | Kinder Morgan | 0 | 0 | X | X | | | | | | | |
| KM-MW-5 | Kinder Morgan | 0 | 0 | X | X | | | | | | | |
| MW-01-26 | RPAC | 0 | 0 | X | X | | | | | | | |
| MW-01-41 | RPAC | 0 | 0 | X | X | | | | | | | |
| MW-01-56 | RPAC | 0 | 0 | X | X | | | | | | | |
| MW-01-76 | RPAC | 0 | 0 | X | X | | | | | | | |
| MW-02-26 | RPAC | 0 | 1.5 | X | X | | | | | | | |
| MW-02-46 | RPAC | 0 | 0 | X | X | | | | | | | |
| MW-02-62 | RPAC | 0 | 0 | X | X | | | | | | | |
| MW-03-27 | RPAC | 0 | 0 | X | X | | | | | | | |
| MW-03-49 | RPAC | 0 | 0 | X | X | | | | | | | |
| MW-03-68 | RPAC | 0 | 0 | X | X | | | | | | | |
| MW-03-81 | Wacker | 0 | 0 | X | X | X | | X | X | | | |
| MW-03-I | Wacker | 0 | 0 | X | X | X | | X | X | X | | |
| MW-03-S | Wacker | 0 | 0 | X | X | X | | X | | | | |
| MW-04-27 | RPAC | 0 | 0 | X | X | X | X | X | | | | X |
| MW-04-47 | RPAC | 0 | 0 | X | X | X | X | X | X | | | X |
| MW-04-63 | RPAC | 0 | 0 | X | X | | | | | | | |
| MW-05-24 | RPAC | 0 | 0 | X | X | | | | | | | |
| MW-05-34 | RPAC | 0 | 0.109 | X | X | | | | | | | |
| MW-05-52 | RPAC | 0 | 0 | X | X | X | X | X | X | | | X |
| MW-05-70 | RPAC | 0 | 0 | X | X | X | X | X | X | | | X |
| MW-06-S | Wacker | 0 | 0 | X | X | | | | | | | |
| MW-07-S | Wacker | 0 | 0 | X | X | | | | | | | |
| MW-08-27 | RPAC | 3.1 | 0 | X | X | | | | | | | |
| MW-08-46 | RPAC | 0 | 0.33 | X | X | | | | | | | |
| MW-08-64 | RPAC | 0 | 0 | X | X | | | | | | | |
| MW-09-23 | RPAC | 0 | 0 | X | X | X | X | X | X | | X | X |
| MW-09-42 | RPAC | 0 | 0 | X | X | X | X | X | X | X | X | X |
| MW-09-58 | RPAC | 0 | 0 | X | X | X | X | X | X | | | X |

**TABLE 1**
Revised Final Measurement and Sampling List
Focused Spring 2001 Groundwater Characterization Event
RPAC - Portland Site

| Location | | NAPL Measurements* | | Measurement and Sampling Requirements | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SITE ID | Property Owner | LNAPL (Inches) | DNAPL (Inches) | Water Elevation Measurement | NAPL Measurement If Present | VOCs by EPA 8260B | Phenols by EPA 8041 | Herbicides by EPA 8151A | Dioxins/ Furans by EPA 8290 | Metals by EPA 6020 | Pesticides by EPA 8081A | Natural Attenuation |
| MW-09-80 | RPAC | 0 | 0 | X | X | | | | X | | | X |
| MW-10-24 | RPAC | 0 | 0 | X | X | | | | | X | X | X |
| MW-10-44 | RPAC | 0 | 0 | X | X | | | | | | X | X |
| MW-10-57 | RPAC | 0 | 0 | X | X | | | | | | X | X |
| MW-11-24 | RPAC | 0 | 0 | X | X | | | | | | X | X |
| MW-11-37 | RPAC | 0 | 0 | X | X | | | | | X | X | X |
| MW-11-56 | RPAC | 0 | 0 | X | X | | | | | | | X |
| MW-11-79 | RPAC | 0 | 0 | X | X | | | | | | | X |
| MW-12-27 | RPAC | 0 | 0 | X | X | | | | | | | |
| MW-12-41 | RPAC | 0 | 0 | X | X | | | | | | | |
| MW-12-59 | RPAC | 0 | 0 | X | X | | | | | | | |
| MW-12-79 | RPAC | 0 | 0 | X | X | | | | | | | |
| P-07 | RPAC | 0.319 | 0 | X | X | | | | | | | |
| P-10 | RPAC | 0 | 0 | X | X | | | | | | | |
| P-11 | RPAC | 0 | 0 | X | X | | | | | | | |
| PP-08 | RPAC | 0 | 0 | X | X | | | | | | | |
| PP-11 | RPAC | 0 | 0 | X | X | | | | | | | |
| PZ-02-40 | Portland | 0 | 0 | X | X | | | | | | | |
| PZ-1-11 | RPAC | 0 | 0 | X | X | | | | | | | |
| RP-01-31 | BN/SF | 0 | 0 | X | X | X | | X | X | X | | X |
| RP-01-51 | BN/SF | 0 | 0 | X | X | X | | X | X | X | | X |
| RP-01-65 | BN/SF | 0 | 0 | X | X | X | | X | X | | | X |
| RP-02-31 | Atofina | 0 | 0 | X | X | X | | X | X | X | | |
| RP-02-49 | Atofina | 0 | 0 | X | X | X | | X | X | X | | |
| RP-02-66 | Atofina | 0 | 0 | X | X | X | | X | X | | | |
| RP-03-30R | BN/SF | 0 | 0 | X | X | X | | | X | | | |
| RP-03-52R | BN/SF | 0 | 0 | X | X | X | | X | X | | | |
| RP-04-16 | RPAC | 0 | 0 | X | X | X | X | X | X | | | X |
| RP-04-41 | RPAC | 0 | 0 | X | X | X | X | X | X | | | X |
| RP-05-16 | RPAC | 0 | 0 | X | X | | | | | | | |
| RP-06-30 | BN/SF | 0 | 0 | X | X | X | | X | | X | | |
| RP-06-87 | BN/SF | 0 | 0 | X | X | X | | X | X | X | | |
| RPW-02 | RPAC | 0 | 0 | X | X | | | | | | X | |
| RPW-03 | RPAC | 0 | 0 | X | X | | | | | | | |
| RPW-05 | RPAC | 0 | 0 | X | X | | | | | | | |
| W-03-D | Gould | 0 | 0 | X | X | | | | | | | |
| W-03-I | Gould | 0 | 0 | X | X | X | | X | | | | |
| W-03-S | Gould | 0 | 0 | X | X | | | | | | | |
| W-04-89 | Gould | 0 | 0 | X | X | | | | X | X | | |
| W-04-I | Gould | 0 | 0 | X | X | | | | | | | |
| W-04-S | Gould | 0 | 0 | X | X | | | | | | | |
| W-06-B | RPAC | 0 | 0 | X | X | | | | | | | |
| W-06-D | RPAC | 0 | 0 | X | X | | | | | | | |
| W-06-S | RPAC | 0 | 0 | X | X | | | | | | | |
| W-08 | RPAC | 0 | 0 | X | X | X | | X | | | | X |
| W-08-26 | RPAC | 0 | 0 | X | X | X | | X | | X | | X |
| W-08-74 | RPAC | 0 | 0 | X | X | X | | X | | | | X |
| W-09 | RPAC | 0 | 0 | X | X | | | | | | | |
| W-09-116 | RPAC | 0 | 0 | X | X | X | | X | | | | X |

**TABLE 1**
Revised Final Measurement and Sampling List
Focused Spring 2001 Groundwater Characterization Event
RPAC - Portland Site

| Location | | NAPL Measurements* | | Measurement and Sampling Requirements | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SITE ID | Property Owner | LNAPL (inches) | DNAPL (inches) | Water Elevation Measurement | NAPL Measurement If Present | VOCs by EPA 8260B | Phenols by EPA 8041 | Herbicides by EPA 8151A | Dioxins/ Furans by EPA 8290 | Metals by EPA 6020 | Pesticides by EPA 8081A | Natural Attenuation |
| W-09-86 | RPAC | 0 | 0 | X | X | | | | | | | |
| W-10 | Portland | 0 | 0 | X | X | | | | | | | |
| W-11-B | ESCO | 0 | 0 | X | X | X | | X | X | | | X |
| W-11-D | ESCO | 0 | 0 | X | X | X | | X | X | | | X |
| W-11-I | ESCO | 0 | 0 | X | X | X | | X | X | X | | X |
| W-11-S | ESCO | 0 | 0 | X | X | X | | X | X | | | X |
| W-12-D | ESCO | 0 | 0 | X | X | | | | | | | |
| W-12-I | ESCO | 0 | 0 | X | X | | | | | | | |
| W-12-S | ESCO | 0 | 0 | X | X | | | | | | | |
| W-15-D | Metro | 0 | 0 | X | X | X | | X | | | | X |
| W-15-I | Metro | 0 | 0 | X | X | X | | X | X | X | | X |
| W-15-S | Metro | 0 | 0 | X | X | X | | X | X | X | | X |
| W-16-31 | Schnitzer | 0 | 0 | X | X | X | X | X | X | | | |
| W-16-D | Schnitzer | 0 | 0 | X | X | | | | | | | |
| W-16-I | Schnitzer | 0 | 0 | X | X | X | | X | X | X | | |
| W-16-S | Schnitzer | 0 | 0 | X | X | | | | | | | |
| W-18-D | PGE | 0 | 0 | X | X | | X | | | | | X |
| W-18-I | PGE | 0 | 0 | X | X | | | | | | | X |
| W-18-S | PGE | 0 | 0 | X | X | | | | | | | X |
| W-19-D | Atofina | 0 | 0 | X | X | X | | X | | | | X |
| W-19-I | Atofina | 0 | 0 | X | X | X | | X | | X | | |
| W-19-S | Atofina | 0 | 0 | X | X | X | | X | | X | | |
| NDL-SG | BN/SF | 0 | 0 | X | | | | | | | | |
| WDL-SG | BN/SF | 0 | 0 | X | | | | | | | | |

*NAPL Measurements collected during Comprehensive Fall 2000 Groundwater Monitoring Event.

WILLAMETTE RIVER

WACKER

ATOFINA

ESCO

GOULD

SCHITZER

METRO

Former East Doane Lake

West Doane Lake

North Doane Lake

BNSF

Rte 30

LEGEND

- W-16-31 — Collect Water Elevation and NAPL Thickness Measurements, Sample Well for Chemical Testing
- ASW-08 — Collect Water Elevation and NAPL Thickness Measurements only
- Property Boundary
- Surface Water Boundary
- 8260B, 8041 / MAP — Analytical Methods / Natural Attenuation Parameters

amec

7477 S.W. Tech Center Drive
Portland, OR, U.S.A. 97223

| | |
|---|---|
| W.O. | 0-61M-107030T43 |
| DESIGN | JF |
| DRAWN | HWN/DRF |
| DATE | MAY 2001 |
| SCALE | 1"=350' |

**FIGURE 1**
**REVISED FINAL FOCUSED SPRING 2001 GROUNDWATER CHARACTERIZATION EVENT SAMPLING AND MEASUREMENT LOCATIONS RPAC, PORTLAND SITE**

AMEC DRAWING NO. K:\10000\10700\10703\GISKEYDATA\CHEM\MAPS\T43Maps\SAMPLOCS5.DWG

**URS Corporation**

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*Offices Worldwide*

April 27, 2000
92C0804A/45

Eric Blischke
Environment Policy Analyst
Department of Environmental Quality
2020 S.W 4th Ave.
Portland, Oregon 97201

Subject: Monitoring Well Abandonment Activities
RP-03 Well Cluster-Wacker Siltronics Property
RPAC, Portland Site

Dear Eric:

On behalf of Rhone-Poulenc AG Company (RPAC), this letter addresses the planned abandonment of the two existing RP-03 wells on Wacker Property. As discussed between Roger Gresh and you on both, April 21, 2000, and April 25, 2000 it appears that both of the wells in the RP-03 cluster are no longer useable for the investigation. This observation was first made on April 7th during sampling activities, based on the presence of sand in the well casing. Groundwater was not sampled from the deep well, because the pump could not be lowered to the screen interval. An attempt was made on April 18th to re-develop the well, however this was unsuccessful. Bentonite slurry was placed in the well casings from total depth to ground surface on April 25th.

Each well will be abandoned per Oregon WRD regulations. During well abandonment activities protective casing will be driven to the total depth of both wells. Attempts will be made to pull the well casings to facilitate examination of the casing. The casings will be drilled out if they are unable to be pulled out. Following the removal of the well casing, screen, and annular material, each borehole will be grouted with a bentonite-cement slurry, from the bottom up, as the protective casing is withdrawn. Well design for the new wells in this area will be based on field observations of the well casing made during the abandonment activities.

Abandonment for the two wells is tentatively scheduled for the week of May 8th. A letter that will describe the design and schedule for the installation of the two new wells will be issued following the abandonment activities. RPAC intends to install and sample these new wells as soon as possible and will include these analytical results with the spring 2000 sampling round results.



SCOEPA00010425

If you have any questions, please call (503) 222-7200.

Sincerely,
URS Corporation

Roger Gresh, P.G.
Project Manager

Mike Edwards, P.E.
Project Engineer

cc: R. Ferguson, RPAC
J. Benedict, CHBH&L
M. Kent, DEQ – NW Region
C. Young, Wacker Siltronic Inc.

State of Oregon
Department of Environmental Quality Memorandum

**Date:** 08/03/98

**To:** Interested Persons

**From:** Kimberlee Van Patten
Listing Coordinator

Enclosed is an update of the Department of Environmental Quality (DEQ's) Confirmed Release List (CRL) and Inventory. Each site listing includes the name, address, ECSI site ID#, contaminant, media contaminated, phase and the current program. The DEQ maintains these lists for public information purposes. These lists are developed from DEQ's Environmental Cleanup Site Information System (ECSI), which includes sites that are or may be contaminated and may require cleanup. The attached summary explains these lists further.

DEQ is adding 16 sites to the Confirmed Release List and 10 sites to the Inventory. In addition, DEQ has removed the Jessup Millwork II site from both the CRL and Inventory and the Summersun Greenhouse Co. from the CRL. Currently, there are 364 sites on the Confirmed Release List and 196 sites on the Inventory. Before adding sites to these lists, the DEQ notifies the current owners and operators, if known, and allows them 45 days to comment. Before delisting sites, DEQ opens a thirty day public comment period, allowing any interested persons the opportunity to comment. The next quarterly update of the CRL and Inventory is expected in October 1998.

It should be noted that there are a number of sites on both the CRL and Inventory where responsible parties have entered into an agreement with DEQ to voluntarily address contamination associated with their property. Under DEQ's Voluntary Cleanup Program, responsible parties may obtain DEQ oversight of assessment and cleanup actions leading to a No Further Action (NFA) determination from the Agency. New voluntary cleanup projects are initiated as soon as resources become available. The initials VCS under the Current Program header on the CRL and Inventory is an indicator that the specified site has entered into the Voluntary Cleanup Program. Additionally, the initials SRS indicate that the site may be facing enforcement action through the DEQ Site Response Program. The initials SAS would indicate that the site is still under investigation through the DEQ Site Assessment Program.

The CRL and Inventory do not include all sites in Oregon that are in the cleanup process. At some sites, responsible parties will perform cleanup on their own without DEQ oversight. In addition, some simple sites are cleaned up before the listing process is complete. There are also sites where information was provided during the comment period which indicates that listing is no longer necessary.

We appreciate your interest. If you have questions, you may call the Site Assessment Program at 229-5256.

## INTERPRETING THE LISTS

Sites are organized on both lists in the following four categories based on the status of cleanup. Sites move from one phase to the next as cleanup progresses.

**Phase I:** Facilities where remedial investigation and feasibility studies have not been initiated.

**Phase II:** Facilities where remedial investigation or feasibility studies are underway.

**Phase III:** Facilities where the remedial investigation and feasibility studies have been completed and remedial design, removal or remedial action is underway.

**Phase IV:** Facilities where all necessary removal and remedial action have been completed except for continuing operation and maintenance or other environmental or institutional controls necessary to protect health, safety, welfare, and the environment.

The current status of activities within each phase are further described in the Action Status field on each list. The following codes are used:

EV Site Evaluation-Evaluation of reported release to determine if a Preliminary Assessment or other action is needed.

PA Preliminary Assessment-Initial assessment of a site to determine if a release of a hazardous substance requires detailed site characterization or cleanup.

SI Site Investigation- (A.K.A. Expanded Preliminary Assessment) Expanded site assessment conducted to gather additional information to support the decision for further action.

RI Remedial Investigation-Detailed site characterization to determine the full extent of contamination, evaluate risks to human health and the environment, and develop information to support the Feasibility Study.

FS Feasibility Study-Identification and assessment of alternative removal and remedial actions (cleanup).

RD Remedial Design-Design of selected cleanup alternatives.

RA Remedial Action-Implementation of selected cleanup alternatives.

You may contact DEQ's Waste Management and Cleanup Division at 229-5913 for more information regarding these lists.

# SUMMARY OF CONFIRMED RELEASE LIST AND INVENTORY OF HAZARDOUS SUBSTANCE SITES

## Overview:

One of the environmental goals of the State of Oregon is to clean up sites throughout the state which are contaminated with hazardous wastes, petroleum products, and other hazardous substances. A key step in this process is to identify the contaminated sites. To accomplish this the Oregon legislature has directed the Department of Environmental Quality (DEQ) to implement a comprehensive site discovery program to:

A. Identify and assess releases or threats of releases of hazardous substances that may require removal or remedial action;

B. Publish two separate lists of facilities, or sites, where releases of hazardous substances have been confirmed:

   I. a Confirmed Release List (CRL), including all facilities with a confirmed release; and

   II. an Inventory, including facilities with a confirmed release which, in addition, based on a preliminary assessment, DEQ has determined require further investigation, removal, remedial action, or related long-term environmental or institutional controls; and

C. Rank facilities on the Inventory based on the long and short-term threats they pose to public health and the environment.

The DEQ adds sites that are or may be contaminated and may require cleanup to its Environmental Cleanup Site Information system (ECSI), an electronic filing system. DEQ adds these sites to the CRL and Inventory when it determines they meet the respective criteria for listing, described above. Sites may be added to the CRL any time after they are added to the ECSI; they may be added to the Inventory only after a preliminary assessment is completed. Sites added to the Inventory are either already on the CRL or are added to both lists at the same time.

Prior to adding a site to either the CRL or Inventory, DEQ notifies the current owners and operators and allows them to comment on the proposed listing. DEQ removes sites from these lists when all necessary cleanup has been completed. Sites requiring long term environmental or institutional controls remain on the lists.

DEQ will update the CRL and Inventory quarterly and provide notice of updates to interested persons. The Summaries of the CRL and Inventory identify the listed sites and key information about each site. The CRL and Inventory also include a more extensive Facility Report for each site.

The requirements for this comprehensive site discovery program are established in Oregon's Environmental Cleanup Law, ORS 465.215 through 245, and DEQ's administrative rules, OAR 340-122-410-470.

## NATIONAL PRIORITIES LIST

These are sites which have been investigated and EPA has determined that the site may represent a long-term threat to public health and the environment. EPA places sites on the NPL after evaluating them using the Hazard Ranking System (HRS). The HRS is a scoring system used to evaluate potential relative risks to public health and the environment from releases or threatened releases of hazardous substances. EPA and States use the HRS to calculate a site score, from 0 to 100, based on actual or potential threat of release of substances to air, surface water, or groundwater. The score is the primary factor used to decide if a hazardous waste site should be placed on the National Priorities List (NPL).

Only sites included on the NPL: are eligible for remedial action using Superfund monies, though the agency can use the Superfund to pay for emergency removals at non-NPL sites. Superfund is a Trust Fund which was created under the Comprehensive Environmental Response, Compensation, and Liability Act. Under the program, the EPA can either: 1). Pay for site cleanup when parties responsible for the contamination cannot be located or are unwilling or unable to perform the work; or 2). Take legal action to force parties responsible for site contamination to cleanup the site or pay back the Federal government for the cost of the cleanup.

### FEDERAL NATIONAL PRIORITY SITES IN OREGON

| SITES | DEQ SITE ID# | LOCATION | DEQ CONTACT |
|---|---|---|---|
| Gould Battery | #49 | Portland | Jill Kiernan |
| Joseph Forest Products | #61 | Joseph | Jill Kiernan |
| Union Pacific RR Tie Treatment | #54 | The Dalles | Brian McClure |
| Northwest Pipe and Casing | #139 | Clackamas | Debbie Bailey |
| Teledyne Wah Chang | #315 | Albany | Max Rosenberg |
| Umatilla Army Depot | #514 | Hermiston | Brian McClure |
| United Chrome Products | #317 | Corvallis | Max Rosenberg |
| McCormick and Baxter | #74 | Portland | Bill Dana |
| Reynolds Metal | #154 | Troutdale | Mavis Kent |
| White King/Lucky Lass | #601 | Lakeview | Brian McClure |

East Multnomah County Groundwater, #1479, in Gresham was proposed in 1993, but has not yet been placed on the NPL. DEQ site contact for this site is Bruce Gilles. Allied Plating, #6, was deleted from the NPL in 1994. DEQ site contact for this site is Jill Kiernan. Martin-Marietta Aluminum Co., #72, was deleted from the NPL on July 5, 1996. Brian McClure is the DEQ site contact for Martin-Marietta.

# Summary of Facilities on DEQ Confirmed Release List (CRL)

Oregon Department of Environmental Quality August 3, 1998

SCOEPA00010431

DEQ ENVIRONMENTAL CLEANUP SITE INFORMATION SYSTEM

SITES ADDED TO THE CRL SINCE APRIL 23, 1998

| SITE NAME | SITE ID | SITE ADDRESS | ACTION CODE | START DATE | COMPLETION DATE |
|---|---|---|---|---|---|
| Allied Systems Co. | 249 | 2300 NE Oregon ST Sherwood 97140 | LSC | 24JUL1998 | 24JUL1998 |
| Boise Cascade - Pigeon Creek | 1979 | 2.5 miles north of Valsetz, Siletz River Road Valsetz 97393 | LSC | 15JUL1998 | 15JUL1998 |
| CENEX - Madras | 616 | 116 NW Depot RD Madras 97741 | LSC | 16JUL1998 | 16JUL1998 |
| City of Oakridge Bald Knob Property | 234 | 48513 Hwy 58 Oakridge 97463 | LSC | 24JUL1998 | 24JUL1998 |
| Columbia Helicopters | 30 | 14452 Arndt RD NE Aurora 97002 | LSC | 11MAY1998 | 11MAY1998 |
| Louisiana Pacific - Snow Mountain Pine | 1998 | Hwy 20 S Hines 97738 | LSC | 16JUL1998 | 16JUL1998 |
| Met-Tek Inc. | 2024 | 15651 SE 125th CT Clackamas 97015 | LSC | 14MAY1998 | 14MAY1998 |
| ORE-IDA Foods | 1447 | 175 NE 6th AVE Ontario 97914 | LSC | 16JUL1998 | 16JUL1998 |
| Old Dominion Carstar | 1731 | 1060 W 1st AVE Eugene 97402 | LSC | 22JUL1998 | 22JUL1998 |
| Pacific Car Crushing | 2057 | 12122 N Columbia BLVD Portland 97203 | LSC | 24JUL1998 | 24JUL1998 |
| Parrett Mountain Sludge Lagoons | 309 | T3S/R2W/Section 23 Newberg 97132 | LSC | 15JUN1998 | 15JUN1998 |
| Safeway Store #308 | 1694 | 70 E Oak ST Lebanon 97355 | LSC | 28JUL1998 | 28JUL1998 |
| Taylor's Landing | 1983 | 7164 Alsea Hwy Waldport 97394 | LSC | 16JUL1998 | 16JUL1998 |
| Union Pacific RR - Crescent Lake | 1466 | Wye Track Crescent Lake 97425 | LSC | 28JUL1998 | 28JUL1998 |
| Union Pacific RR - K. Falls | 297 | 1585 Oak ST Klamath Falls 97601 | LSC | 28JUL1998 | 28JUL1998 |
| Union Pacific RR - Tar Pits | 1909 | RR tracks adjacent to Hwy 30 La Grande 97850 | LSC | 28JUL1998 | 28JUL1998 |

(action_list.sql)

16 rows selected.

SCOEPA00010432

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| 217 Distribution Center - Building D<br>11000 SW 11th AVE, Building D<br>Beaverton 97005 | 1969 | dichloroethylene,1,2-cis-<br>tetrachloroethylene<br>trichloroethylene<br>vinyl chloride | | 2 | VCS |
| A & F Auto Paint Supply Co.<br>5341 SE McLoughlin BLVD<br>Portland 97202 | 1739 | dichloroethylene,1,1-<br>toluene<br>trichloroethylene<br>vinyl chloride | Groundwater | 1 | SAS |
| A-dec Inc.<br>2601 Crestview DR<br>Newberg 97132 | 1184 | benzene<br>dichloroethane,1,1-<br>dichloroethylene,1,1-<br>tetrachloroethylene<br>trichloroethane,1,1,1-<br>trichloroethylene<br>xylenes | Groundwater<br>Soil | 2 | VCS |
| AAR Western Skyways<br>Portland-Troutdale Airport<br>Troutdale 97060 | 92 | chromium<br>cyanide (as ion)<br>lead<br>trichloroethylene | Soil | 1 | SAS |
| AB Finishing Tech<br>6724 NE 46th AVE<br>Portland 97218 | 871 | chromium | Groundwater | 2 | VCS |
| ANRFS Holdings Inc.<br>3333 NW 35th AVE<br>Portland 97210 | 1820 | benzene<br>dichloroethane,1,1-<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>ethylbenzene<br>methylene chloride<br>tetrachloroethylene<br>toluene<br>trichloroethane,1,1,1-<br>trichloroethylene<br>trimethylbenzene,1,2,4-<br>vinyl chloride<br>xylenes | Groundwater | 1 | SAS |
| ARCO Bulk Terminal<br>9930 NW St. Helens RD<br>Burlington 97231 | 1528 | diesel - fuel oil<br>gasoline | Groundwater<br>Soil | 1 | SAS |



SCOEPA00010433

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| ASII/Chevron Tank Farm<br>NE Airport WAY<br>Portland 97211 | 1832 | benzene<br>ethylbenzene<br>petroleum hydrocarbons<br>toluene<br>xylenes | Groundwater<br>Soil | 1 | SAS |
| Abe's Main Street Cleaners<br>10863 SE Main ST<br>Milwaukie 97222 | 1258 | tetrachloroethylene | Groundwater<br>Soil | 2 | SRS |
| Advanced Transmission<br>905 W 1st AVE<br>Eugene 97402 | 1073 | oil - waste | Groundwater<br>Soil | 1 | SAS |
| Ag-Chem Warehouse<br>160 W Main ST Extension<br>Hillsboro 97123 | 1688 | acetone<br>aldrin<br>bhc,gamma-<br>chloroform<br>dieldrin<br>methyl ethyl ketone<br>methylene chloride | Soil | 1 | SAS |
| Airways Aircraft Refinishing<br>6080 Wigrich RD<br>Independence 97351 | 1120 | chromium<br>dichloroethylene,1,2-<br>trichloroethylene | Soil | 1 | SAS |
| Alkali Lake<br>30S/23E/S18<br>Alkali Lake 97640 | 291 | phenols<br>tetrachlorodibenzo-p-dioxin,2,3,7,8-<br>toluenediamine,2,4- | Groundwater<br>Soil | 2 | SRS |
| Allied Systems Co.<br>2300 NE Oregon ST<br>Sherwood 97140 | 249 | petroleum hydrocarbons<br>solvents | Groundwater<br>Soil | 1 | SAS |
| Alpine Cleaners - Greenway<br>12180 SW Scholls Ferry RD<br>Tigard 97223 | 1639 | dichloroethane,1,2-<br>dichloroethylene,1,2-cis-<br>dichloroethylene,1,2-trans-<br>tetrachloroethylene<br>trichloroethylene | Groundwater | 1 | VCS |
| American Bronze Inc.<br>2505 SE Gladstone ST<br>Portland 97202 | 1400 | copper<br>lead<br>zinc | Soil | 1 | SAS |
| American Spa Manufacturing Co. | 1122 | styrene | Soil | 1 | SAS |

(crel_list.rpt)

SCOEPA00010434

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| American Spa Manufacturing Co. (Cont.)<br>15385 Woodburn-Monitor RD NE<br>Woodburn 97071 | | total petroleum hydrocarbons (tph) | | | |
| Anderson Brothers Property<br>5275 & 5315 NW St. Helens RD<br>Portland 97210 | 970 | hydrocarbons<br>paint wastes and solvents | Soil | 1 | SAS |
| Apollo Metal Finishing Inc.<br>7525 SE Johnson Creek BLVD<br>Portland 97206 | 1 | arsenic<br>chromium<br>copper<br>cyanide (as ion)<br>dimethyl phthalate<br>lead<br>mercury<br>pcb 1254<br>pcb 1260<br>xylenes<br>zinc | Soil | 1 | VC |
| Arrow Transportation Co. - Multnomah<br>10145 N Portland RD<br>Portland 97203 | 186 | phenols<br>phthalates | Soil | 1 | SAS |
| Astoria Auto Wrecking & Towing<br>850 Hwy 101<br>Astoria 97103 | 1913 | cadmium<br>chromium<br>lead<br>petroleum hydrocarbons | Soil | 1 | SAS |
| Astoria Marine Construction Co.<br>403 SW Front ST<br>Astoria 97103 | 1898 | | | 1 | SAS |
| Astoria Plywood Corp.<br>409 23rd ST<br>Astoria 97103 | 1370 | benzene<br>ethylbenzene<br>pcbs<br>pentachlorophenol<br>petroleum hydrocarbons<br>total petroleum hydrocarbons (tph)<br>xylenes | Sediment<br>Soil | 3 | SRS |
| Auric Enterprises<br>10200 NE 6th DR<br>Portland 97211 | 96 | pcb 1254 | Soil | 1 | SAS |



SCOEPA00010435

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Automatic Vending<br>5001 N Lagoon AVE<br>Portland 97217 | 1430 | total petroleum hydrocarbons (tph) | Soil | 1 | SAS |
| BLM Wareyard<br>589 W Fillmore<br>Burns 97720 | 1260 | oil - waste | Groundwater | 1 | SAS |
| BPA - St. Johns Substation<br>12567 N Columbia BLVD<br>Portland 97203 | 1858 | dichloroethane,1,1-<br>dichloroethylene,1,1-<br>pcbs<br>trichloroethane,1,1,1- | Groundwater<br>Soil | 1 | SAS |
| Bair Logging Co. Property (former)<br>596 Rose AVE<br>Vernonia 97064 | 1787 | petroleum hydrocarbons | Groundwater<br>Soil | 1 | SAS |
| Baker Property<br>30301 Riverview DR<br>Junction City 97448 | 755 | d,2,4-<br>ddt,p,p'-<br>parathion<br>silvex | Sediment<br>Soil | 1 | SAS |
| Balteau Standard<br>8001 Table Rock RD<br>White City 97503 | 533 | acetone<br>dichlorobenzenes<br>dichloroethanes<br>dichloroethylenes<br>methyl-2-pentanone,4-<br>methylene chloride<br>pcbs<br>petroleum hydrocarbons<br>tetrachloroethylene<br>trichloroethanes<br>trichloromonofluoromethane<br>xylenes | Groundwater<br>Soil | 2 | VCS |
| Bank of California - Astoria<br>927 Marine DR<br>Astoria 97103 | 1467 | diesel - fuel oil<br>gasoline<br>oil - waste | Soil | 2 | VCS |
| Baron Blakeslee<br>5920 NE 87th AVE<br>Portland 97211 | 1274 | acetone<br>methylene chloride<br>tetrachloroethylene<br>trichloroethane,1,1,1-<br>trichloroethylene | Groundwater<br>Soil | 1 | RCRA |



SCOEPA00010436

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Beaver Creek Auto Salvage<br>22675 S Beaver Creek RD<br>Beavercreek 97004 | 11 | pcbs | Soil | 1 | SAS |
| Beaverton Mall<br>3205 SW Cedar Hills BLVD<br>Beaverton 97005 | 691 | dichloroethylene,1,2-cis-<br>tetrachloroethylene<br>trichloroethylene | Groundwater | 2 | VCS |
| Beck's Spray Service - Vale<br>Vale Airport<br>Vale 97918 | 767 | carbofuran<br>toxaphene | Soil | 1 | SAS |
| Bend Millwork Systems (BMS)<br>62845 Boyd Acres RD<br>Bend 97701 | 323 | bis(2-ethylhexyl)phthalate<br>pentachlorophenol<br>trichloroethanes<br>trichloroethylene | Sludge<br>Soil<br>Surface Water | 2 | VCS |
| Benton Auto Wreckers<br>6055 SW Philomath BLVD<br>Corvallis 97333 | 1070 | benzene<br>ethylbenzene<br>oil or fuel related compounds<br>pcbs<br>toluene<br>total petroleum hydrocarbons (tph)<br>xylenes | | 2 | VCS |
| Bergsoe Metal Corp.<br>444 Port AVE<br>St. Helens 97051 | 12 | cadmium<br>lead | Groundwater<br>Soil | 4 | SRS |
| Blackwell RD Drug Lab<br>9464 Blackwell RD<br>Central Point 97502 | 1032 | dimethyl-3-pentanone,2,4-<br>dimethylhydroperoxide,1,1-<br>dimethylphenethylamine,alpha,alpha- | Soil | 1 | SAS |
| Blount Inc.<br>4909 SE International WAY<br>Milwaukie 97222 | 267 | chromium<br>dichloroethane,1,2-<br>dichloroethylene,1,2-cis-<br>methylene chloride<br>tetrachloroethylene<br>trichloroethylene<br>vinyl chloride<br>zinc | Groundwater<br>Other<br>Soil | 2 | VCS |
| Blue Mountain Forest Products<br>800 Eagle ST<br>Long Creek 97856 | 1950 | benzene<br>total petroleum hydrocarbons (tph) | | 4 | VCS |



SCOEPA00010437

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Blue Sky Filters<br>2833 NE Sandy Boulevard<br>Portland 97232 | 2054 | petroleum hydrocarbons<br>tetrachloroethylene | Soil | 1 | SAS |
| Boeing of Portland<br>19000 NE Sandy BLVD<br>Portland 97230 | 13 | dichloroethylene,1,1-<br>trichloroethane,1,1,1-<br>trichloroethylene | Groundwater<br>Soil | 1 | SRS |
| Boise Cascade - Joseph Mill<br>600 W Joseph ST (Hwy 82)<br>Joseph 97846 | 1661 | chromium<br>lead<br>petroleum | Groundwater<br>Soil | 3 | VCS |
| Boise Cascade - Pigeon Creek<br>2.5 miles north of Valsetz, Siletz River Road<br>Valsetz 97393 | 1979 | total petroleum hydrocarbons (tph) | | 1 | SAS |
| Borden Packaging and Industrial Products<br>10915 N Lombard ST<br>Portland 97203 | 1277 | acetone<br>chloroethane<br>dichloroethane,1,1-<br>dichloroethylene,1,2-<br>methyl ethyl ketone<br>methyl-2-pentanone,4-<br>tetrachloroethylene<br>toluene<br>trichloroethylene | Groundwater | 1 | SAS |
| Bors Property<br>18247 S Grasle RD<br>Oregon City 97045 | 901 | pcb 1221 | Soil | 1 | VCS |
| Brazier Forest Products Inc.<br>15555 Hwy 211S<br>Molalla 97038 | 252 | bunker - fuel oil<br>chlorinated solvents<br>pentachlorophenol<br>tetrachlorophenol,2,3,4,6- | Soil | 1 | SAS |
| Brogoitti Elevator Corp. - North<br>150 Columbia ST<br>Helix 97835 | 1645 | pesticides | | 1 | SAS |
| Bud's Auto Wrecking<br>7100 SE Fern AVE<br>Portland 97206 | 1598 | petroleum hydrocarbons | Soil | 1 | SAS |
| Bud's Radiator Shop<br>1715 Washington St | 1968 | lead | Soil | 1 | SAS |



SCOEPA00010438

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Bud's Radiator Shop (Cont.)<br><br>Oregon City 97045 | | | | | |
| Burlington Northern RR - Deschutes River Spill<br>Deschutes River Milepost 42<br>Maupin (north of) 0 | 1992 | diesel - fuel oil | Soil<br>Surface Water | 2 | VCS |
| CENEX - Madras<br>116 NW Depot RD<br>Madras 97741 | 616 | dinoseb<br>toluenediamine,2,4- | Soil | 1 | VCS |
| CMD Transportation<br>12340 SE Jennifer ST<br>Clackamas 97015 | 1214 | lead<br>polyaromatic hydrocarbons (pah)<br>total petroleum hydrocarbons (tph) | Groundwater<br>Soil | 1 | VCS |
| Canyon Exchange<br>12720 SW Canyon RD<br>Beaverton 97005 | 1709 | butylbenzene,n-<br>dichlorobenzene,1,4-<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>dichloroethylene,1,2-trans-<br>ethylbenzene<br>fuel oil<br>isopropyltoluene,p-<br>petroleum<br>propylbenzene,n-<br>tetrachloroethylene<br>toluene<br>trichloroethylene<br>trimethylbenzenes<br>vinyl chloride<br>xylenes | Groundwater<br>Soil | 2 | VCP |
| Carlton Co.<br>3901 SE Naef RD<br>Oak Grove 97268 | 1035 | dichloroethylene,1,1-<br>tetrachloroethane,1,1,1,2-<br>toluene<br>trichloroethylene<br>vinyl chloride | Groundwater<br>Soil | 2 | SRS |
| Carver Coach<br>5004 SE Johnson Creek BLVD<br>Milwaukie 97222 | 1463 | diesel - fuel oil<br>lead<br>pcbs<br>toluene | Soil | 1 | SAS |
| Cascade Chemicals Inc. | 1352 | cumene | Groundwater | 1 | SAS |



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SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Cascade Chemicals Inc. (Cont.)<br>16081 SE Evelyn ST<br>Clackamas 97015 | | ethylbenzene<br>methylene chloride<br>naphthalene<br>propylbenzene,n-<br>solvents<br>tetrachloroethylene<br>toluene<br>trichloroethylene<br>trimethylbenzene,1,2,4-<br>xylenes | | | |
| Cascade Corp.<br>2201 NE 201st DR<br>Troutdale 97060 | 635 | arsenic<br>chromium<br>copper<br>cyanide (as ion)<br>dichloroethylene,1,2-cis-<br>methylene chloride<br>nickel<br>oil - lubricating<br>tetrachloroethane,1,1,1,2-<br>tetrachloroethylene<br>toluene<br>trichloroethane,1,1,1-<br>trichloroethylene<br>vinyl chloride | | 3 | SRS |
| Cascade Plating & Machine<br>3790 Cross ST<br>Eugene 97402 | 1042 | chromium<br>chromium, hexavalent<br>lead | | 2 | VCS |
| Catellus Development Corp. - Milwaukie<br>SE 37th AVE & SE Monroe ST<br>Milwaukie 97222 | 887 | petroleum hydrocarbons<br>polyaromatic hydrocarbons (pah)<br>volatile organic compounds (voc) | Groundwater<br>Soil | 2 | VCS |
| Chambers Fuel Oil Inc.<br>400 California AVE<br>North Bend 97459 | 22 | total hydrocarbons (as diesel) | Groundwater<br>Soil | 1 | SRS |
| Champion Mill Site (Former)<br>556 Rifle Range RD<br>Roseburg 97470 | 1367 | dichloroethylene,1,1-<br>total petroleum hydrocarbons (tph)<br>trichloroethane,1,1,1- | Groundwater<br>Soil | 2 | VCS |
| Charles H. Lilly Co.<br>7737 NE Killingsworth ST<br>Portland 97218 | 102 | aldrin<br>benzene<br>bhc,gamma- | Groundwater<br>Soil | 1 | SAS |



SCOEPA00010440

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Charles H. Lilly Co. (Cont.) | | chlordane<br>ddd,p,p'-<br>dde,p,p'-<br>ddt,p,p'-<br>dicamba<br>dichloroprop<br>dieldrin<br>ethylbenzene<br>fluoranthene<br>pentachlorophenol<br>t,2,4,5-<br>toluene<br>toluenediamine,2,4-<br>total petroleum hydrocarbons (tph)<br>toxaphene<br>xylenes | | | |
| Chemcentral Corp.<br>10821 N Lombard ST<br>Portland 97203 | 878 | dichloroethane,1,1-<br>dichloroethylene,1,2-cis-<br>ethylbenzene<br>tetrachloroethylene<br>toluene<br>trichloroethane,1,1,1-<br>trichloroethylene<br>volatile organic compounds (voc)<br>xylenes | Groundwater<br>Soil | 2 | VCS |
| Chevron Bulk Plant (Former) - Astoria<br>10 5th ST<br>Astoria 97103 | 1402 | acenaphthene<br>benzene<br>benzo(a)anthracene<br>benzo(a)pyrene<br>benzo(b)fluoranthene<br>benzo(k)fluoranthene<br>chrysene<br>diesel - fuel oil<br>ethylbenzene<br>fluoranthene<br>fluorene<br>gasoline<br>naphthalene<br>phenanthrene<br>pyrene<br>toluene<br>xylenes | Groundwater<br>Soil | 1 | SAS |



SCOEPA0001044

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Chevron Bulk Plant - Coos Bay<br>2640 N Bayshore<br>Coos Bay 97420 | 542 | gasoline<br>oil or fuel related compounds | Groundwater | 2 | VCS |
| Chevron USA - Adams Terminal<br>Wild Horse Creek<br>Adams 97810 | 675 | oil or fuel related compounds | Groundwater | 2 | VCS |
| Chevron USA - Baker City Terminal<br>3370 17th ST<br>Baker City 97814 | 664 | benzene<br>toluene<br>total petroleum hydrocarbons (tph)<br>xylenes | Groundwater<br>Soil | 2 | VCS |
| Chevron USA Asphalt Refinery<br>5501 NW Front AVE<br>Portland 97210 | 1281 | acenaphthylene<br>arsenic<br>barium<br>benzene<br>benzo(a)anthracene<br>benzo(a)pyrene<br>benzo(b)fluoranthene<br>benzo(k)fluoranthene<br>chrysene<br>diesel - fuel oil<br>ethylbenzene<br>gasoline<br>naphthalene<br>phenols<br>toluene<br>total petroleum hydrocarbons (tph)<br>vanadium<br>xylenes | Groundwater<br>Soil | 2 | VCS |
| Chiloquin Forest Products<br>Blocklinger ST (end of)<br>Chiloquin 97624 | 1213 | oil - waste<br>total petroleum hydrocarbons (tph) | Groundwater<br>Soil | 1 | SRS |
| City of Oakridge Bald Knob Property<br>48513 Hwy 58<br>Oakridge 97463 | 234 | benzene<br>dioxins<br>pcb 1221<br>pcbs<br>pentachlorophenol<br>petroleum hydrocarbons | Groundwater<br>Soil | 2 | VCS |
| Coast Guard ANT Astoria<br>Tongue Point WAY | 182 | copper<br>lead | Sediment<br>Soil | 1 | VCS |

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SCOEPA0010442

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Coast Guard ANT Astoria (Cont.) | | | | | |
| Astoria 97103 | | | | | |
| Columbia American Plating Co.<br>3003 NW 35th AVE<br>Portland 97210 | 29 | benzo(a)anthracene<br>benzo(a)pyrene<br>benzo(b)fluoranthene<br>benzo(ghi)perylene<br>benzo(k)fluoranthene<br>cadmium<br>chromium<br>chrysene<br>cyanide (as ion)<br>hydrochloric acid<br>indeno(1,2,3-cd)pyrene<br>tetrachloroethylene<br>trichloroethylene<br>zinc | Soil | 1 | SAS |
| Columbia Helicopters<br>14452 Arndt RD NE<br>Aurora 97002 | 30 | chromium<br>dichloroethylene,1,1-<br>methylene chloride<br>trichloroethane,1,1,1-<br>trichloroethylene | Groundwater<br>Soil | 3 | SRS |
| Columbia Slough<br>31.5 miles of waterway over an 18 mile stretch to th<br>Portland 0 | 1283 | aluminum<br>antimony<br>arsenic<br>cadmium<br>chromium<br>cobalt<br>copper<br>dde,p,p'-<br>iron<br>lead<br>manganese<br>mercury<br>nickel<br>pcbs<br>polyaromatic hydrocarbons (pah)<br>selenium<br>titanium<br>toluene<br>zinc | Sediment | 2 | SRS |



SCOEPA0001044

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Columbia Steel/Joslyn Sludge Pond<br>10580 N Macrum AVE<br>Portland 97203 | 104 | acenaphthylene<br>anthracene<br>benzene<br>benzo(a)anthracene<br>dibenzofuran<br>fluoranthene<br>fluorene<br>naphthalene<br>pentachlorophenol<br>phenanthrene<br>pyrene<br>toluene | Groundwater<br>Soil | 4 | SRS |
| Continental Chrome<br>90260 Prairie RD<br>Eugene 97404 | 303 | cadmium<br>chromium<br>nickel | Soil<br>Surface Water | 1 | SAS |
| Coos - Curry Electric Co-op<br>74 W 1st ST<br>Coquille 97423 | 1107 | total petroleum hydrocarbons (tph) | Soil | 2 | VCS |
| Cornell Pump<br>2323 SE Hanna Harvester DR<br>Milwaukie 97222 | 1093 | dichloroethane,1,1-<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-trans-<br>tetrachloroethylene<br>toluene<br>total petroleum hydrocarbons (tph)<br>trichloroethane,1,1,1-<br>trichloroethylene<br>xylenes | Groundwater<br>Other<br>Soil | 2 | VCS |
| Cornucopia Mine Tailings<br>7S/45E/S27<br>Cornucopia 97834 | 1039 | arsenic<br>cyanide (as ion)<br>lead<br>mercury | | 2 | VCS |
| Crater Lake Chevron<br>1901 Crater Lake Hwy<br>Medford 97501 | 1920 | tetrachloroethylene | | 1 | SAS |
| Crescent Mini Mart<br>Hwy 97 Milepost 185.3<br>Crescent 97733 | 1718 | petroleum | Groundwater<br>Soil | 2 | SRS |
| Crop Production Services - Umatilla | 821 | d,2,4- | Soil | 1 | SAS |

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SCOEPA00010444

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Crop Production Services - Umatilla (Cont.)<br>321 5th ST<br>Umatilla 97882 | | dicamba<br>eptc<br>mcpa<br>metribuzin | Surface Water | | |
| Crystal Lite Manufacturing Co.<br>11971 SW Herman RD<br>Tualatin 97062 | 107 | dichloroethane,1,1-<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>tetrachloroethylene<br>trichloroethane,1,1,1-<br>trichloroethylene | Groundwater<br>Soil | 2 | VCS |
| Cummings Transfer - Tax Lots 1501 & 1504<br>2901-1/2 3rd ST<br>Tillamook 97141 | 1581 | benzene<br>ethylbenzene<br>toluene<br>xylenes | Groundwater | 1 | SAS |
| DAW Forest Products Co.<br>SE Wilson AVE (foot of)<br>Bend 97709 | 1451 | acetone<br>cresol,4-<br>lead<br>petroleum<br>solvent - waste<br>total petroleum hydrocarbons (tph) | Groundwater<br>Soil | 2 | VCS |
| Dant & Russell (DAR) - Mill Site<br>818 Hillcrest AVE<br>North Plains 97133 | 108 | arsenic<br>benzo(a)anthracene<br>benzo(a)pyrene<br>chromium<br>copper<br>pentachlorophenol<br>polyaromatic hydrocarbons (pah)<br>xylenes | Groundwater<br>Soil | 3 | SRS |
| DeWitt Construction<br>10910 NE Holman ST<br>Portland 97220 | 1350 | arsenic<br>chromium<br>dichloroethane,1,1-<br>dichloroethylene,1,2-cis-<br>diesel - fuel oil<br>lead<br>mercury<br>methylene chloride<br>tetrachloroethylene<br>trichloroethane,1,1,1-<br>trichloroethylene | Groundwater<br>Soil | 1 | SRS |



SCOEPA0010445

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Dobyns & Hart Pest Control - Portland<br>3303 SE 122nd AVE<br>Portland 97266 | 256 | chlordane<br>dimpylate<br>endosulfan<br>heptachlor<br>malathion | Soil | 1 | SAS |
| Don Rasmussen Co. - SW Morrison<br>1737 SW Morrison ST<br>Portland 97205 | 1684 | benzene<br>gasoline<br>tetrachloroethylene<br>total petroleum hydrocarbons (tph)<br>trichloroethylene | Soil | 1 | SAS |
| Douglas County Forest Products<br>398 Del Rio RD<br>Winchester 97495 | 671 | petroleum | Soil<br>Surface Water | 1 | SAS |
| Dow Corning - Springfield Plant<br>1801 S "A" ST<br>Springfield 97477 | 694 | dichloroethane,1,1-<br>dichloroethylene,1,1-<br>oil - lubricating<br>pcb 1221<br>tetrachloroethylene<br>trichloroethane,1,1,1-<br>trichloroethylene | Groundwater<br>Soil | 4 | SRS |
| Eagle Automotive Machine Shop<br>36557 SE Tracy RD<br>Estacada 97023 | 1757 | cadmium<br>dichlorobenzene,1,2-<br>lead<br>petroleum hydrocarbons<br>tetrachloroethylene | Soil | 1 | SAS |
| Eastern OR Adolescent Multi-Treatment Center<br>412 SE Dorion AVE<br>Pendleton 97801 | 1899 | dieldrin | Soil | 2 | VCS |
| Elf Atochem North America<br>6400 NW Front AVE<br>Portland 97210 | 398 | ammonia<br>chlorobenzene<br>ddt,p,p'-<br>sodium bichromate<br>sodium chlorate | Groundwater<br>Soil<br>Surface Water | 2 | VCS |
| Elstor Sales Corp. - Tax Lots 1101 & 1103<br>1100 Old Salem RD<br>Albany 97321 | 401 | arsenic<br>chromium<br>lead<br>pcbs | | 1 | VCS |

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SCOEPA00010446

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Endicott Trucking Co.<br>21410 SW Dahlke LN<br>Sherwood 97140 | 1599 | diesel - fuel oil | Soil | 1 | SAS |
| Engine Parts & Machine<br>711 McClaine ST<br>Silverton 97381 | 1072 | solvents | Groundwater<br>Soil | 1 | SAS |
| Erickson Air-Crane Co.<br>3100 Willow Springs RD<br>Central Point 97502 | 1231 | chlorobenzene<br>dichlorobenzene,1,2-<br>dichloroethane,1,1-<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-<br>tetrachloroethylene<br>trichloroethane,1,1,1-<br>trichloroethylene | Groundwater | 2 | SRS |
| Eugene Farmer's Co-op - Prairie RD<br>2690 Prairie RD<br>Eugene 97402 | 1752 | benzene | Groundwater | 1 | SAS |
| Eugene Former Manufactured Gas Plant<br>700 block of E 8th AVE (north of 8th)<br>Eugene 97401 | 1723 | benzo(a)anthracene<br>benzo(a)pyrene<br>chrysene | Soil | 2 | VCS |
| Eugene Sand & Gravel II<br>3000 Delta Hwy<br>Eugene 97401 | 1210 | benzene<br>methyl-2-pentanone,4-<br>toluene<br>total petroleum hydrocarbons (tph)<br>trichloroethane,1,1,1-<br>xylenes | Groundwater<br>Soil | 1 | SAS |
| Eugene Stud & Veneer<br>3300 Cross ST<br>Eugene 97402 | 39 | chlorobenzene<br>pcb 1221<br>trichlorobenzene,1,2,3-<br>trichlorobenzene,1,2,4- | Groundwater<br>Soil | 1 | SAS |
| Eyerly Aircraft<br>2050 Turner RD SE<br>Salem 97302 | 305 | chromium<br>lead | Soil | 1 | SAS |
| Farmcraft Facility (Former)<br>8900 SW Commercial ST<br>Tigard 97223 | 1223 | aldrin<br>ddt,p,p'-<br>dieldrin<br>endosulfan | Soil | 2 | VCS |



SCOEPA00010447

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Farmcraft Facility (Former) (Cont.) | | heptachlor<br>toxaphene | | | |
| Fashion Cleaners<br>623 Klamath AVE<br>Klamath Falls 97601 | 1004 | dichloroethylene,1,2-cis-<br>tetrachloroethylene<br>trichloroethane,1,1,1-<br>trichloroethylene | Groundwater<br>Soil | 4 | SRS |
| Firestone Tire & Auto Service Center<br>185 E 11th AVE<br>Eugene 97401 | 1208 | benzene<br>tetrachloroethylene<br>trichloroethylene | Soil | 1 | SAS |
| Fleet Maintenance Facility - Eugene (City of) PW<br>1820 Roosevelt BLVD<br>Eugene 97402 | 1554 | dichloroethanes<br>dichloroethylenes<br>diesel - fuel oil<br>gasoline<br>trichloroethylene | Groundwater<br>Soil | 1 | SAS |
| Flightcraft<br>7505 NE Airport WAY<br>Portland 97218 | 704 | aviation - fuel oil<br>benzene<br>cadmium<br>gasoline<br>lead<br>tetrachloroethylene | Groundwater<br>Soil | 1 | SAS |
| Foothill BLVD Dump Site<br>Btwn 3074 & 3570 Foothill BLVD<br>Grants Pass 97526 | 578 | arsenic<br>barium<br>bis(2-ethylhexyl)phthalate<br>cadmium<br>chromium<br>copper<br>dieldrin<br>lead<br>mercury<br>oil or fuel related compounds<br>pcb 1221<br>selenium<br>silver<br>zinc | Groundwater<br>Soil | 1 | SRS |
| Forrest Paint Co.<br>1011 McKinley ST<br>Eugene 97402 | 201 | acetone<br>benzene<br>ethylbenzene<br>methyl ethyl ketone<br>methyl-2-pentanone,4- | Groundwater<br>Soil | 4 | SRS |



SCOEPA00010448

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Forrest Paint Co. (Cont.) | | toluene<br>xylenes | | | |
| Freres Lumber Co. - Lyons<br>40580 Cedar Mill RD<br>Lyons 97358 | 202 | pentachlorophenol<br>tetrachlorophenol,2,3,4,6- | Groundwater<br>Soil | 2 | VCS |
| Frontier Leather Co.<br>1210 NE Oregon ST<br>Sherwood 97140 | 116 | chromium<br>lead | Groundwater<br>Sediment<br>Soil | 1 | SRS |
| Fuel Processors<br>4150 N Suttle Rd<br>Portland 97217 | 673 | arsenic<br>benzene<br>benzo(a)pyrene<br>benzo(b)fluoranthene<br>benzo(k)fluoranthene<br>chrysene<br>dibenzo(a,h)anthracene<br>dichloroethylene,1,1-<br>indeno(1,2,3-cd)pyrene<br>lead<br>methyl-2-pentanone,4-<br>methylene chloride<br>naphthalene | | 2 | SRS |
| GASCO<br>7540 NW St. Helens RD<br>Portland 97210 | 84 | acenaphthene<br>anthracene<br>benzo(a)pyrene<br>ethylbenzene<br>fluoranthene<br>fluorene<br>lead<br>naphthalene<br>phenanthrene<br>phenol<br>pyrene | Groundwater<br>Soil | 2 | VCS |
| GE Apparatus Service Shop - Conger ST<br>537 Conger ST<br>Eugene 97402 | 1755 | pcbs<br>trichloroethylene | Groundwater | 1 | SAS |
| GNB Battery<br>576 Patterson ST NW<br>Salem 97304 | 358 | diesel - fuel oil<br>lead | Soil | 1 | VCS |



SCOEPA00010449

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| GNB Battery - Beaverton<br>11155 SW Denney RD<br>Beaverton 97005 | 142 | lead | Sediment<br>Soil<br>Surface Water | 4 | VCS |
| Galvanizers Co.<br>2406 NW 30th AVE<br>Portland 97210 | 1196 | chromium<br>iron<br>lead<br>petroleum hydrocarbons<br>zinc | | 1 | SAS |
| Goetz ST - Roseburg<br>1673 Goetz ST<br>Roseburg 97470 | 1825 | diesel - fuel oil | Soil | 1 | SAS |
| Gould Inc./NL Industries Inc.<br>5909 NW 61st AVE<br>Portland 97210 | 49 | arsenic<br>cadmium<br>chromium<br>lead<br>sulfuric acid<br>zinc | Air<br>Groundwater<br>Sediment<br>Soil<br>Surface Water | 3 | SRS |
| Grant & Roth Plastics<br>1600 NE 25th AVE<br>Hillsboro 97124 | 1064 | dichloroethylene,1,2-cis-<br>tetrachloroethylene<br>trichloroethylene<br>vinyl chloride | | 2 | VCS |
| Green Brothers Logging<br>6320 Hwy 35<br>Mount Hood 97041 | 1198 | benzene<br>diesel - fuel oil<br>ethylbenzene<br>gasoline<br>naphthalene<br>toluene<br>xylenes | Groundwater<br>Soil | 2 | SRS |
| Gresham (City of) Old Shop Site<br>219 S Main ST<br>Gresham 97030 | 1675 | benzene<br>benzo(a)anthracene<br>benzo(a)pyrene<br>benzo(b)fluoranthene<br>chlordane<br>chrysene<br>ddd,p,p'-<br>dde,p,p'-<br>ethylbenzene<br>heptachlor<br>indeno(1,2,3-cd)pyrene | Sludge<br>Soil | 2 | VCS |



SCOEPA00010450

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Gresham (City of) Old Shop Site (Cont.) | | lead<br>pcbs<br>toluene<br>total petroleum hydrocarbons (tph)<br>xylenes | | | |
| Groundwater - Hilda ST<br>Hilda ST (just east of Molalla AVE)<br>Oregon City 97045 | 1412 | dichloroethylene,1,2-<br>tetrachloroethylene<br>trichloroethylene | Groundwater | 1 | SAS |
| Groundwater - Hwy 26 & Locust ST<br>875 Madras Hwy<br>Prineville 97754 | 730 | benzene<br>gasoline | Groundwater<br>Soil | 1 | SAS |
| Groundwater - Mountain View DR<br>2050 E Mountain View DR<br>Newberg 97132 | 341 | trichloroethane,1,1,1- | Groundwater | 1 | SAS |
| Groundwater - N Columbia BLVD<br>N Columbia BLVD<br>Portland 97217 | 1161 | tetrachloroethylene<br>toluene<br>trichloroethane,1,1,1-<br>trichloroethylene | Groundwater | 1 | SAS |
| Groundwater - NE 55th AVE & Columbia BLVD<br>5611 NE Columbia BLVD<br>Portland 97218 | 1015 | chloroform<br>dichloroethylene,1,2-cis-<br>tetrachloroethylene<br>trichloroethylene | Groundwater | 1 | SAS |
| Groundwater - SE 1st AVE & Stephens ST<br>Vicinity of SE 1st & Stephens ST<br>Portland 97214 | 1556 | tetrachloroethylene<br>trichloroethylene | Groundwater | 1 | SAS |
| Guilds Lake<br>2615-2619 NW Industrial ST<br>Portland 97210 | 404 | chromium<br>lead | Groundwater<br>Other | 3 | SRS |
| Gunderson Inc.<br>4350 NW Front AVE<br>Portland 97210 | 1155 | cadmium<br>chromium<br>copper<br>dichloroethylene,1,1-<br>lead<br>mercury<br>nickel<br>pcbs<br>solvent - waste | Groundwater<br>Soil | 2 | VCS |



SCOEPA00010451

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Gunderson Inc. (Cont.) | | tetrachloroethylene<br>total petroleum hydrocarbons (tph)<br>trichloroethane,1,1,1-<br>zinc | | | |
| Hanna Car Wash International<br>2000 SE Hanna Harvester DR<br>Milwaukie 97222 | 1114 | petroleum hydrocarbons<br>semi-volatiles<br>trichloroethylene | Groundwater<br>Soil | 1 | SRS |
| Harbor Oil Inc.<br>11535 N Force ST<br>Portland 97217 | 24 | fluoranthene<br>lead<br>oil or fuel related compounds<br>pyrene<br>tetrachloroethylene<br>total petroleum hydrocarbons (tph)<br>trichloroethylene | Groundwater<br>Sediment<br>Soil<br>Surface Water | 1 | VC |
| Hardman Property<br>1730 Broadway<br>Baker City 97814 | 1057 | mercury | | 1 | SAS |
| Harvey's Cleaners<br>5745 NE Prescott ST<br>Portland 97218 | 1518 | diesel - fuel oil<br>solvents | Soil | 1 | SRS |
| Hayden Island Cleaners<br>1190 N Jantzen DR<br>Portland 97217 | 1865 | tetrachloroethylene | Groundwater<br>Soil | 1 | SRS |
| Hayden Island Landfill<br>N Hayden Island DR<br>Portland 97217 | 1559 | arsenic<br>benzene<br>beryllium<br>cadmium<br>chromium<br>copper<br>ethylbenzene<br>lead<br>mercury<br>nickel<br>silver<br>toluene<br>xylenes | Groundwater | 1 | SAS |
| Heidgerken Property<br>9S/7E/S20 | 1094 | bis(2-ethylhexyl)phthalate<br>di-n-octyl phthalate | Soil | 1 | SAS |

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SCOEPA00010452

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Heidgerken Property (Cont.)<br><br>Breitenbush 97342 | | ethylbenzene<br>phthalic anhydride<br>toluene<br>total xylenes | | | |
| Helfrich Property<br>251 NE 133rd AVE<br>Portland 97230 | 122 | benzo(b)fluoranthene<br>chromium<br>chrysene<br>lead<br>mercury<br>pcb 1260<br>pentachlorophenol<br>zinc | Soil | 1 | SAS |
| Herbert Lumber Co.<br>656 Riddle By-Pass RD<br>Riddle 97469 | 1733 | pentachlorophenol | Soil<br>Surface Water | 1 | SAS |
| Hertz Equipment Rental Facility<br>4939 NE Columbia BLVD<br>Portland 97218 | 1403 | total petroleum hydrocarbons (tph) | Soil | 1 | SAS |
| Hicks Striping & Curbing<br>4733 Lancaster DR NE<br>Salem 97305 | 710 | paint wastes and solvents | Soil | 1 | SAS |
| Hill Investment Co.<br>3322 NW 35th AVE<br>Portland 97210 | 1076 | dichloroethylene,1,2-cis-<br>tetrachloroethane,1,1,1,2-<br>trichloroethylene<br>vinyl chloride | Groundwater | 1 | SAS |
| Hillstrom's<br>912 N Front ST<br>Coos Bay 97420 | 1174 | arsenic<br>chromium<br>copper<br>lead<br>mercury<br>zinc | Other | 1 | VCS |
| Hoffman Construction Co.<br>8027 NE Killingsworth ST<br>Portland 97218 | 1522 | chloroform<br>methylene chloride<br>pcbs<br>tetrachloroethylene<br>trichloroethane,1,1,1-<br>trichloroethylene | Soil | 1 | SRS |



SCOEPA00010453

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Houston Inc.<br>3939 SE 26th AVE<br>Portland 97202 | 1052 | dichloroethylene,1,2-<br>petroleum<br>tetrachloroethylene<br>trichloroethylene | Groundwater<br>Soil | 2 | VCS |
| Hoyt ST Railyard<br>1105 NW 9th AVE<br>Portland 97209 | 1080 | benzene<br>copper<br>ethylbenzene<br>lead<br>pentachlorophenol<br>polyaromatic hydrocarbons (pah)<br>toluene<br>total petroleum hydrocarbons (tph)<br>trichloroethylene<br>xylenes<br>zinc | Groundwater<br>Soil<br>Surface Water | 2 | SRS |
| Hyster Sales - Tigard<br>7000 SW Sandburg ST<br>Tigard 97223 | 1046 | tetrachloroethylene<br>trichloroethane,1,1,1- | | 1 | SAS |
| ICN Pharmaceuticals - Parcels 234A & 235<br>6060 NE 112th AVE<br>Portland 97220 | 1219 | benzene<br>mercury<br>vinyl chloride | Groundwater<br>Soil | 2 | VCS |
| Illinois Tool Works Inc.<br>5209 SE International WAY<br>Milwaukie 97222 | 1016 | dichloroethane,1,1-<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>trichloroethylene<br>vinyl chloride | Groundwater<br>Soil | 4 | SRS |
| Imation<br>8124 Pacific AVE<br>White City 97503 | 1045 | acetone<br>methyl ethyl ketone<br>toluene | Groundwater | 2 | VCS |
| Immer & Oswald Volvo<br>19490 SE McLoughlin BLVD<br>Gladstone 97027 | 1436 | acetone<br>antimony<br>arsenic<br>benzene<br>butylbenzene,n-<br>butylbenzene,sec-<br>butylbenzene,tert-<br>chloroform<br>chromium<br>cumene | Groundwater<br>Other<br>Soil | 1 | SAS |



SCOEPA00010454

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Immer & Oswald Volvo (Cont.) | | dichloroethane,1,1-<br>dichloroethane,1,2-<br>ethylbenzene<br>ethyltoluene,2-<br>ethyltoluene,4-<br>gasoline<br>hexanone,2-<br>isopropyltoluene,p-<br>lead<br>methyl ethyl ketone<br>methyl-2-pentanone,4-<br>methylene chloride<br>naphthalene<br>oil - waste<br>propylbenzene,n-<br>styrene<br>tetrachloroethane,1,1,2,2-<br>tetrachloroethylene<br>toluene<br>total petroleum hydrocarbons (tph)<br>trichloroethane,1,1,1-<br>trichloroethylene<br>trimethylbenzene,1,2,4-<br>trimethylbenzene,1,3,5-<br>xylenes | | | |
| Industrial Chrome Plating<br>6204 NE Hassalo ST<br>Portland 97213 | 1033 | chromium<br>copper<br>lead<br>plating wastes (chrome, acids)<br>zinc | | 1 | SAS |
| Industrial Coatings<br>17370 SW 63rd AVE<br>Lake Oswego 97034 | 262 | acenaphthene<br>chromium<br>dichloroethylene,1,2-cis- | Groundwater<br>Soil<br>Surface Water | 1 | VCS |
| Intel Corp. - Aloha Campus<br>3585 SW 198th AVE<br>Aloha 97007 | 1131 | dichloroethane,1,1-<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>tetrachloroethylene<br>trichloroethane,1,1,1-<br>trichloroethylene<br>vinyl chloride | | 2 | VCS |
| International Paper Co. - Gardiner Sawmill | 579 | hydrochloric acid | Soil | 1 | SAS |



SCOEPA0010455

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| International Paper Co. - Gardiner Sawmill (Cont.)<br>77618 Hwy 101<br>Gardiner 97441 | | pentachlorophenol<br>tetrachlorophenol,2,3,4,6- | Surface Water | | |
| Interstate Salvage/Calbag Metals<br>8703 SE 82nd AVE<br>Portland 97266 | 1074 | pcb 1221 | Soil | 1 | VCS |
| JB's Metal Finishing<br>5215 SE Flavel DR<br>Portland 97206 | 128 | chromium<br>copper<br>cyanide (as ion)<br>lead | Soil | 1 | SAS |
| JH Baxter & Co. - Eugene<br>85 Baxter ST<br>Eugene 97402 | 55 | acenaphthene<br>arsenic<br>cresols<br>fluoranthene<br>naphthalene<br>pentachlorophenol<br>phenanthrene<br>pyrene | Groundwater | 2 | SRS |
| JO Olsen Manufacturing Co.<br>11 & 41 N Danebo AVE<br>Eugene 97402 | 1254 | pentachlorophenol<br>petroleum hydrocarbons | Groundwater<br>Soil | 2 | VCS |
| James River Corp. - North Portland<br>3400 N Marine DR<br>Portland 97217 | 127 | benzene<br>dichloroethylene,1,1-<br>ethylbenzene<br>tetrachloroethylene<br>toluene<br>trichloroethylene<br>xylenes | Groundwater<br>Soil<br>Surface Water | 1 | SAS |
| James River Corp. - Wauna Mill<br>Hwy 30<br>Wauna 97016 | 649 | arsenic<br>benzo(a)pyrene<br>benzo(b)fluoranthene<br>benzo(k)fluoranthene<br>chromium<br>chrysene<br>dioxins<br>furan<br>pentachlorophenol | | 1 | SAS |
| John Battin Power Service | 1133 | dichloroethylene,1,2-cis- | Groundwater | 4 | VCS |



SCOEPA00010456

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| John Battin Power Service (Cont.)<br>8320 SE Otty RD<br>Portland 97266 | | pcbs<br>total petroleum hydrocarbons (tph)<br>trichloroethylene<br>vinyl chloride | Soil | | |
| Johnson Brothers Auto Wrecking<br>24220 SW Tualatin Valley Hwy<br>Hillsboro 97123 | 1812 | petroleum hydrocarbons | Soil<br>Surface Water | 1 | SAS |
| Johnson Creek Landfill<br>7600 SE Johnson Creek BLVD<br>Milwaukie 97222 | 1232 | benzene<br>cadmium<br>carbon disulfide<br>chlorobenzene<br>chloroform<br>lead<br>phenols<br>polyaromatic hydrocarbons (pah)<br>toluene<br>trichloroethylene | Groundwater<br>Leachate | 1 | SAS |
| Joseph Forest Products (JFP)<br>83518 Russell LN<br>Joseph 97846 | 61 | arsenic<br>chromium<br>copper | Groundwater<br>Soil | 4 | SRS |
| Junkyard John's<br>246 S 16th ST<br>Springfield 97477 | 1880 | petroleum | Soil | 1 | VCS |
| K-Lines Inc.<br>17375 SW 63rd AVE<br>Lake Oswego 97035 | 266 | lead<br>petroleum hydrocarbons | Other<br>Sludge<br>Soil<br>Surface Water | 1 | SAS |
| Keno Area Groundwater Contamination<br>39S/8E/S31 & 40S/8E/S6<br>Keno 97627 | 2028 | benzene | | 1 | SRS |
| Kimwood Corp.<br>77684 Hwy 99S<br>Cottage Grove 97424 | 1442 | chromic acid | Groundwater<br>Soil | 2 | VCS |
| LD McFarland<br>90049 Hwy 99N<br>Eugene 97402 | 63 | acenaphthene<br>anthracene<br>chlorophenol,2-<br>methylnaphthalene,2- | Groundwater<br>Soil<br>Surface Water | 3 | SRS |



SCOEPA00010457

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| LD McFarland (Cont.) | | naphthalene<br>pentachlorophenol<br>phenanthrene<br>trichlorophenol,2,4,6- | | | |
| Lakeview Ranger Station<br>524 N "G" ST<br>Lakeview 97630 | 1387 | gasoline | | 2 | VCS |
| Laurence-David Inc. (LDI)<br>1400 S Bertelsen RD<br>Eugene 97402 | 65 | acetone<br>benzene<br>dichloroethane,1,1-<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-trans-<br>ethyl acetate<br>ethylbenzene<br>lead<br>methyl ethyl ketone<br>methyl-2-pentanone,4-<br>methylene chloride<br>toluene<br>trichloroethane,1,1,1-<br>vinyl acetate<br>xylenes | Groundwater<br>Other<br>Soil | 2 | SRS |
| Lebanon Area Groundwater Contamination<br>12S/2W/S10<br>Lebanon 97355 | 1089 | dichloroethylene,1,2-cis-<br>methylene chloride<br>tetrachloroethylene<br>trichloroethane,1,1,1-<br>trichloroethylene | | 2 | SRS |
| Lebanon Plywood - Log Pond<br>E Milton ST<br>Lebanon 97355 | 1614 | oil - lubricating | Sediment<br>Soil | 1 | SAS |
| Linnton Oil Fire Training Grounds<br>North side of Hwy 30 on NW Marina WAY<br>Burlington 97231 | 1189 | acenaphthene<br>anthracene<br>arsenic<br>benzene<br>benzo(a)anthracene<br>benzo(a)pyrene<br>chrysene<br>dichloroethane,1,1-<br>dichloroethylene,1,1-<br>ethylbenzene | Groundwater | 2 | VCS |



SCOEPA0010458

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Linnton Oil Fire Training Grounds (Cont.) | | fluoranthene<br>fluorene<br>naphthalene<br>phenanthrene<br>pyrene<br>toluene<br>trichloroethane,1,1,1-<br>xylenes | | | |
| Louis Dreyfus Facility<br>N Holladay ST (Foot of)<br>Portland 97227 | 1394 | total petroleum hydrocarbons (tph) | Soil | 1 | SAS |
| Louisiana Pacific - Pendleton<br>2203 S Court PL<br>Pendleton 97801 | 1495 | dichlorobenzenes | Soil | 2 | VCS |
| Louisiana Pacific - Snow Mountain Pine<br>Hwy 20 S<br>Hines 97738 | 1998 | arsenic<br>benzene<br>benzo(a)anthracene<br>chromium<br>chrysene<br>copper<br>ethylbenzene<br>gasoline<br>lead<br>naphthalene<br>nickel<br>zinc | Groundwater<br>Sediment<br>Soil<br>Surface Water | 2 | VCS |
| Loveness Lumber Mill (Former)<br>Loveness RD<br>Malin 97632 | 1157 | benzene<br>dichloroethane,1,2-<br>ethylbenzene<br>pentachlorophenol<br>polyaromatic hydrocarbons (pah)<br>toluene<br>xylenes | | 2 | VCS |
| MOCON Construction<br>Lot adjacent to 2140 Turner RD SE<br>Salem 97302 | 1241 | styrene | Soil | 1 | SAS |
| MR Wood Card Lock Facility<br>1680 Alsea Hwy<br>Waldport 97394 | 1647 | petroleum | Soil | 1 | VCS |



SCOEPA00010459

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Magnum Salvage/Horizon Vehicles<br>1052 Goldfish Farm RD<br>Albany 97321 | 852 | arsenic<br>lead<br>pcbs | Soil | 1 | SAS |
| Mahlon Sweet Airport<br>28827 Douglas DR<br>Eugene 97402 | 1060 | total petroleum hydrocarbons (tph) | Soil | 1 | SAS |
| Martin Marietta Reduction Facility (MMRF)<br>3313 W 2nd ST<br>The Dalles 97058 | 72 | arsenic<br>cyanide (as ion)<br>fluoride (as ion)<br>polyaromatic hydrocarbons (pah) | Groundwater<br>Leachate<br>Other<br>Soil | 4 | SRS |
| Masonite II<br>700 N Cedar RD<br>Pilot Rock 97868 | 1875 | pentachlorophenol<br>petroleum hydrocarbons | | 1 | VCS |
| McCall Heating & Cooling<br>1650 NE Lombard ST<br>Portland 97211 | 1748 | diesel - fuel oil<br>petroleum hydrocarbons | Soil | 1 | SAS |
| McCall Oil & Chemical Corp.<br>585 Hamburg ST<br>Astoria 97103 | 73 | arsenic<br>lead<br>oil or fuel related compounds<br>pyrene | Groundwater<br>Soil | 1 | SAS |
| McCormick & Baxter Creosoting Co.<br>6900 N Edgewater ST<br>Portland 97203 | 74 | arsenic<br>chromium<br>copper<br>pentachlorophenol<br>polyaromatic hydrocarbons (pah) | Groundwater<br>Sediment<br>Soil<br>Surface Water | 3 | SRS |
| McGill Nursery<br>22315 NE Glisan ST<br>Gresham 97030 | 1764 | dieldrin<br>dinoseb<br>pcbs<br>total petroleum hydrocarbons (tph) | | 1 | VCS |
| McGovern Metals Inc. - Roseburg<br>3801 Hwy 99S<br>Roseburg 97470 | 1807 | petroleum | Sediment | 1 | SAS |
| Mears Property<br>13725 SW Millikan WAY<br>Beaverton 97005 | 1592 | dichloroethane,1,1-<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>dichloroethylene,1,2-trans- | Groundwater<br>Soil | 1 | VCS |



SCOEPA00010460

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Mears Property (Cont.) | | tetrachloroethylene<br>trichloroethane,1,1,1-<br>trichloroethylene<br>vinyl chloride | | | |
| Mercer Industries - Beaverton<br>10740 SW Denney RD<br>Beaverton 97005 | 136 | pentachlorophenol | Groundwater<br>Soil | 2 | VCS |
| Merlin Landfill<br>1749 Merlin RD<br>Grants Pass 97526 | 286 | benzene<br>carbon disulfide<br>dichlorobenzene,1,4-<br>dichloroethane,1,2-<br>dichloroethylene,1,2-cis-<br>dichloropropane,1,2-<br>methyl ethyl ketone<br>methylene chloride<br>nitrophenol,4-<br>tetrachloroethylene<br>toluene<br>trichloroethylene<br>vinyl chloride | Groundwater | 2 | SRS |
| Met-Tek Inc.<br>15651 SE 125th CT<br>Clackamas 97015 | 2024 | petroleum hydrocarbons | Soil | 1 | SAS |
| Mew Data Arms (MDA)<br>1120 Spring ST<br>Klamath Falls 97601 | 619 | acetone<br>benzene<br>chlorobenzene<br>chloroethane<br>chromium<br>cyanide (as ion)<br>dichloroethane,1,1-<br>tetrachloroethane,1,1,2,2-<br>toluene<br>trichloroethane,1,1,1-<br>trichloroethylene<br>xylenes | Groundwater<br>Soil<br>Surface Water | 2 | VCS |
| Mid-State Properties Inc. - Albany Facility<br>200 S Pacific BLVD<br>Albany 97321 | 1207 | benzene<br>ethylbenzene<br>lead<br>toluene<br>xylenes | | 2 | VCS |



SCOEPA00010461

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Midway Truck Stop (Former)<br>241 Bear Creek RD<br>Curtin 97428 | 1863 | petroleum | | 1 | SAS |
| Milwaukie Area Groundwater Contamination<br>1S/2E/S31<br>Milwaukie 97222 | 706 | dichloroethylene,1,2-trans-<br>tetrachloroethylene<br>trichloroethylene | Groundwater | 2 | SRS |
| Mobil Oil Terminal<br>9420 NW St. Helens RD<br>Portland 97231 | 137 | diesel - fuel oil | Groundwater<br>Soil | 3 | VCS |
| Moore Mill & Lumber Co.<br>Riverside DR<br>Bandon 97411 | 80 | pentachlorophenol<br>tetrachlorophenol,2,3,4,6- | Soil | 1 | SAS |
| Moore's Custom Cleaners<br>3 SW Monroe PKWY (at Boones Ferry)<br>Lake Oswego 97035 | 1800 | tetrachloroethylene | Soil | 2 | VCS |
| Morrison Oil Co.<br>3747 N Suttle RD<br>Portland 97217 | 800 | benzene<br>lead<br>pcbs<br>toluene<br>total petroleum hydrocarbons (tph)<br>volatile organic compounds (voc)<br>xylenes | Groundwater<br>Soil | 3 | SRS |
| Mt. Hood NF - Borrow Pit<br>Forest RD 1509<br>Unknown City0 | 1560 | benzo(b)fluoranthene<br>lead | Soil | 1 | SAS |
| Mt. Hood NF - Site B<br>Forest RD 1509<br>Unknown City0 | 1561 | benzo(b)fluoranthene<br>lead<br>oil - waste | Soil | 1 | SAS |
| Multnomah Plywood Corp.<br>58144 Old Portland RD<br>St. Helens 97051 | 82 | petroleum<br>phenols<br>toluene<br>trichloroethane,1,1,1- | Soil<br>Surface Water | 1 | SAS |
| Murphy Plywood Co. - Milwaukie<br>3105 Harrison ST<br>Milwaukie 97222 | 280 | benzo(a)anthracene<br>benzo(a)pyrene<br>benzo(b)fluoranthene<br>benzo(k)fluoranthene | Groundwater<br>Sediment<br>Soil | 1 | SAS |



SCOEPA00010462

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Murphy Plywood Co. - Milwaukie (Cont.) | | bis(2-ethylhexyl)phthalate<br>chrysene<br>dibenzo(a,h)anthracene<br>indeno(1,2,3-cd)pyrene<br>manganese<br>methylene chloride | | | |
| NVPEC Bulk Storage Facility<br>1025 SE 2nd ST<br>Ontario 97914 | 2040 | benzene<br>petroleum | | 1 | VCS |
| NW Cast/Universal Silver<br>9233 N Calvert AVE<br>Portland 97217 | 999 | antimony<br>arsenic<br>benzo(a)pyrene<br>benzo(b)fluoranthene<br>beryllium<br>cadmium<br>chlorinated hydrocarbons<br>chromium<br>chrysene<br>cobalt<br>copper<br>lead<br>mercury<br>nickel<br>pcb 1248<br>pcb 1254<br>pcbs<br>silver<br>total petroleum hydrocarbons (tph)<br>zinc | Soil | 1 | SRS |
| NW Industrial Painting Inc.<br>19700 S Fischers Mill RD<br>Oregon City 97045 | 1758 | butylbenzene,n-<br>ethylbenzene<br>isopropyltoluene,p-<br>methyl-2-pentanone,4-<br>toluene<br>total xylenes<br>trichloroethane,1,1,2-<br>trimethylbenzene,1,2,4- | Soil | 1 | SAS |
| NW Pipe & Casing Co. Parcels A&B - Clackamas<br>9200 SE Lawnfield RD<br>Clackamas 97015 | 139 | pcb 1221<br>polyaromatic hydrocarbons (pah)<br>volatile organic compounds (voc) | Groundwater<br>Sediment<br>Soil<br>Surface Water | 2 | SRS |



SCOEPA0010463

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Niemi Oil Bulk Plant<br>490 Industry ST<br>Astoria 97103 | 1946 | diesel - fuel oil<br>gasoline | | 1 | SAS |
| Norm's Irrigation Service<br>85483 Hwy 99S<br>Eugene 97405 | 1071 | sulfuric acid | Soil | 1 | SAS |
| Norris Paint Co.<br>1675 Commercial ST NE<br>Salem 97303 | 307 | benzene<br>chromium<br>lead<br>methylene chloride<br>tetrachloroethylene<br>zinc | Groundwater<br>Soil | 1 | SAS |
| North Marion County Disposal Facility<br>17827 NE Whitney LN<br>Woodburn 97071 | 1633 | arsenic<br>cadmium<br>lead<br>manganese<br>mercury<br>methylene chloride<br>nickel<br>tetrachloroethylene<br>trichloroethylene | Groundwater | 2 | SRS |
| Nu-Way Oil Co.<br>7039 NE 46th AVE<br>Portland 97218 | 88 | chromium<br>lead<br>pcb 1242<br>pcb 1260<br>petroleum hydrocarbons<br>trichloroethylene | Groundwater<br>Other<br>Sediment<br>Soil | 2 | SRS |
| NuProcess Shielding (NPS)<br>216 NW Earl ST<br>Madras 97741 | 1498 | lead | | 4 | VCS |
| ODOT - Ambler RD East<br>SE 82nd AVE & SE Ambler RD<br>Milwaukie 0 | 1562 | arsenic<br>lead<br>polyaromatic hydrocarbons (pah)<br>total petroleum hydrocarbons (tph) | Soil | 3 | VCS |
| ODOT - Ambler RD West<br>SE Ambler RD & 82nd AVE<br>Clackamas 97015 | 1236 | dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>tetrachloroethylene<br>toluene | Groundwater<br>Soil | 2 | SRS |



SCOEPA00010464

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| ODOT - Ambler RD West (Cont.) | | trichloroethane,1,1,1-<br>trichloroethylene<br>vinyl chloride<br>xylenes | | | |
| ORE-IDA Foods<br>175 NE 6th AVE<br>Ontario 97914 | 1447 | benzene<br>ethylbenzene<br>toluene<br>xylenes | Groundwater<br>Soil | 2 | VCS |
| OREMET Titanium<br>530 W 34th AVE<br>Albany 97321 | 858 | acetone<br>aldrin<br>arsenic<br>beryllium<br>bhc,beta-<br>bis(2-ethylhexyl)phthalate<br>cadmium<br>chloroform<br>chromium<br>copper<br>cyanide (as ion)<br>di-n-butyl phthalate<br>di-n-octyl phthalate<br>dibenzofuran<br>dimethylphenol,2,4-<br>fluoranthene<br>hexachlorobenzene<br>lead<br>mercury<br>methylene chloride<br>naphthalene<br>nickel<br>nitrophenol,2-<br>pcbs<br>phenanthrene<br>phenol<br>pyrene<br>sulfuric acid<br>tetrachloroethylene<br>trichloroanisole,2,3,6-<br>trichloroethylene<br>vanadium<br>xylenes<br>zinc | Sediment<br>Soil<br>Surface Water | 2 | VCS |



SCOEPA00010465

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Old Dominion Carstar<br>1060 W 1st AVE<br>Eugene 97402 | 1731 | polyaromatic hydrocarbons (pah) | | 3 | VCS |
| Old Mill Marina Resort<br>210 S 3rd ST<br>Garibaldi 97118 | 1966 | arsenic<br>dichloroethane,1,1-<br>diesel - fuel oil<br>formaldehyde<br>pcbs<br>trichloroethane,1,1,1- | Groundwater<br>Soil | 1 | VCS |
| Old Town Parking/Helistop Structure<br>33 NW Davis ST<br>Portland 97209 | 383 | acenaphthylene<br>benzene<br>ethylbenzene<br>naphthalene<br>toluene<br>xylenes | Groundwater | 2 | SRS |
| Oregon Air National Guard Base<br>6801 NE Cornfoot RD<br>Portland 97218 | 1372 | benzene<br>benzo(a)anthracene<br>benzo(a)pyrene<br>benzo(b)fluoranthene<br>benzo(ghi)perylene<br>benzo(k)fluoranthene<br>bromochloromethane<br>chrysene<br>dichloroethylene,1,2-<br>ethylbenzene<br>fluoranthene<br>methylene chloride<br>naphthalene<br>phenanthrene<br>toluene<br>trichloroethylene<br>xylenes | Groundwater | 1 | SRS |
| Oregon Fir Supply Co.<br>11100 NE Holman ST<br>Portland 97220 | 1220 | arsenic<br>chromium, hexavalent<br>dichloroethane,1,1-<br>dichloroethylene,1,2-<br>pentachlorophenol<br>tetrachloroethylene<br>trichloroethylene<br>vinyl chloride | Groundwater<br>Soil | 2 | SRS |



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SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Oregon State Penitentiary<br>2605 State ST<br>Salem 97310 | 621 | dichloroethylenes<br>tetrachloroethylene<br>toluene<br>trichloroethylene<br>vinyl chloride | Groundwater<br>Soil | 2 | VCS |
| Oregon Waste Systems - Proposed Transfer Station<br>11535 N Force ST<br>Portland 97217 | 1091 | arsenic<br>barium<br>benzene<br>chromium<br>cobalt<br>dichlorobenzene,1,2-<br>dichlorobenzene,1,3-<br>dichlorobenzene,1,4-<br>dichloroethane,1,1-<br>diesel - fuel oil<br>ethylbenzene<br>gasoline<br>lead<br>mercury<br>methyl-2-pentanone,4-<br>pcb 1221<br>selenium<br>tetrachloroethane,1,1,1,2-<br>trichloroethane,1,1,1-<br>vinyl chloride<br>xylenes | Groundwater<br>Soil | 1 | SAS |
| Oroweat Foods<br>10750 SW 5th ST<br>Beaverton 97005 | 1406 | dichloroethane,1,1-<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-trans-<br>methyl ethyl ketone<br>methylene chloride<br>tetrachloroethylene<br>trichloroethylene | Groundwater | 1 | SAS |
| Osmose Wood Preserving<br>32092 Hwy 34<br>Tangent 97389 | 1369 | chromium | Groundwater | 2 | VCS |
| PC Development Inc.<br>955 N Columbia BLVD<br>Portland 97217 | 143 | trichloroethylene | Groundwater<br>Soil | 1 | SAS |
| PGE - Station L | 151 | pcb 1260 | Sediment | 4 | SRS |



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SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| PGE - Station L (Cont.)<br>1841 SE Water AVE<br>Portland 97214 | | | Soil | | |
| Pacific Car Crushing<br>12122 N Columbia BLVD<br>Portland 97203 | 2057 | oil - waste | | 1 | SAS |
| Pacific Meat Co.<br>2701 N Newark ST<br>Portland 97217 | 145 | arsenic<br>lead<br>mercury<br>pcb 1260 | Sediment<br>Soil | 1 | SRS |
| Pacific Power & Light - Astoria Service Center<br>1224 Marine DR<br>Astoria 97103 | 147 | benzene<br>benzo(a)anthracene<br>benzo(a)pyrene<br>benzo(b)fluoranthene<br>benzo(k)fluoranthene<br>chrysene<br>dibenzo(a,h)anthracene<br>indeno(1,2,3-cd)pyrene | Groundwater<br>Soil | 1 | SAS |
| Palmer Bros. - Snow Mountain Pine<br>Snow Mountain Pine LN<br>Hines 97738 | 2001 | pentachlorophenol | Groundwater<br>Soil | 2 | VCS |
| Parrett Mountain Sludge Lagoons<br>T3S/R2W/Section 23<br>Newberg 97132 | 309 | chlorobenzene<br>pcb 1221<br>tetrachloroethane,1,1,1,2-<br>toluene<br>trichloroethylene<br>xylenes | Other<br>Soil | 1 | VCS |
| Pearl ST Property<br>408 Pearl ST<br>Eugene 97401 | 1191 | benzene<br>dichloroethylenes<br>diesel - fuel oil<br>lead<br>methylene chloride<br>petroleum<br>tetrachloroethylene<br>trichloroethylene<br>vinyl chloride | Groundwater<br>Soil | 2 | VCS |
| Pedee Country Store<br>11150 Kings Valley Hwy | 1197 | gasoline | Groundwater | 1 | SAS |



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SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Pedee Country Store (Cont.)<br><br>Monmouth 97361 | | | | | |
| Pelican Bay/Jeld-Wen of Oregon<br>3307 Lakeport BLVD<br>Klamath Falls 97601 | 57 | diesel - fuel oil<br>dioxins<br>oil or fuel related compounds<br>pentachlorophenol<br>solvents | Groundwater<br>Soil | 2 | SRS |
| Pendleton Grain Growers - Stanfield<br>Feedville & Hinkle roads<br>Hermiston 97838 | 639 | chlordane | Soil | 4 | SRS |
| Permapost Products Co.<br>25600 SW Tualatin Valley Hwy<br>Hillsboro 97123 | 148 | arsenic<br>pentachlorophenol<br>tetrachlorophenol,2,3,4,6- | Groundwater<br>Soil | 1 | SAS |
| Phoenix Industrial Park<br>2511 W 6th AVE<br>Eugene 97402 | 1658 | petroleum hydrocarbons | Sludge | 1 | SAS |
| Pierce Pacific Manufacturing<br>6540 NE 42nd AVE<br>Portland 97218 | 1092 | hydraulic oil | Soil | 1 | SAS |
| Pittsburg Testing Laboratory - Eugene<br>545 Conger ST<br>Eugene 97402 | 1727 | dichloroethylene,1,1-<br>pcbs<br>tetrachloroethylene<br>trichloroethane,1,1,1-<br>trichloroethylene<br>vinyl chloride | Groundwater | 1 | SAS |
| Port of Newport<br>Newport Yaquina Bayfront<br>Newport 97365 | 1827 | oil or fuel related compounds | Sediment | 1 | SAS |
| Port of St. Helens - ODOT Lease<br>Old Portland Rd<br>St. Helens 97051 | 1988 | arsenic<br>ddt,p,p'-<br>lead<br>petroleum hydrocarbons | Soil | 1 | SAS |
| Port of St. Helens Creosote<br>1550 Railroad AVE<br>St. Helens 97051 | 959 | chromium<br>copper<br>naphthalene | Soil | 2 | SRS |



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SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Port of St. Helens Creosote (Cont.) | | phenols<br>polyaromatic hydrocarbons (pah)<br>zinc | | | |
| Portable Equipment Salvage Co. (PESC)<br>10281 SE Mather RD<br>Clackamas 97015 | 149 | copper<br>dichlorobenzenes<br>lead<br>mercury<br>pcb 1260<br>trichloroethane,1,1,1-<br>trichloroethylene<br>zinc | Groundwater<br>Soil | 4 | SRS |
| Precision Equipment Inc.<br>8440 N Kerby ST<br>Portland 97217 | 152 | chromium | Soil | 1 | VCS |
| Pride of Oregon Texaco Station<br>460 N Main ST<br>Tillamook 97141 | 1915 | benzene<br>diesel - fuel oil<br>ethylbenzene<br>gasoline<br>methyl-tert-butyl ether<br>oil - lubricating<br>toluene<br>total petroleum hydrocarbons (tph)<br>xylenes | Groundwater<br>Soil | 1 | SRS |
| Priestley Oil & Chemical Co.<br>2429 N Borthwick AVE<br>Portland 97227 | 1139 | acetone<br>diesel - fuel oil<br>ethylbenzene<br>gasoline<br>isophorone<br>toluene<br>total petroleum hydrocarbons (tph)<br>xylenes | Soil | 1 | SAS |
| Prineville Airport - Pesticide Applicators<br>Hwy 126<br>Prineville 97754 | 293 | d,2,4-<br>dalapon<br>ddt,p,p'-<br>endosulfan ii<br>pesticides | Soil | 1 | SAS |
| RA Gray Co.<br>11445 SW Tiedeman RD<br>Tigard 97223 | 1077 | benzene<br>ethylbenzene<br>lead | Groundwater | 1 | SAS |



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SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| RA Gray Co. (Cont.) | | toluene<br>xylenes | | | |
| RFD Publishing Inc.<br>6960 SW Sandburg RD<br>Tigard 97223 | 1249 | chloroform<br>dichloroethane,1,1-<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>dichloroethylene,1,2-trans-<br>dichloropropene,1,3-trans-<br>tetrachloroethylene<br>trichloroethane,1,1,1-<br>trichloroethane,1,1,2-<br>trichloroethylene | Groundwater | 2 | VCS |
| RMAC International Inc.<br>3601 NW Marine DR<br>Troutdale 97060 | 1918 | arsenic<br>barium<br>benzene<br>bis(2-ethylhexyl)phthalate<br>cadmium<br>chromium<br>chrysene<br>cresols<br>iron<br>lead<br>polyaromatic hydrocarbons (pah) | Leachate<br>Other<br>Sediment<br>Sludge<br>Soil<br>Surface Water | 1 | SRS |
| RR Donnelley Norwest Inc.<br>17401 NE Halsey ST<br>Portland 97230 | 962 | dichloroethylene,1,2-cis-<br>tetrachloroethylene<br>trichloroethylene<br>trichloromonofluoromethane | | 1 | SRS |
| RS Davis Recycling Inc.<br>10105 SE Mather RD<br>Clackamas 97015 | 1927 | cadmium<br>chromium<br>lead<br>mercury<br>pcbs<br>selenium<br>total petroleum hydrocarbons (tph) | Sediment<br>Soil | 1 | SRS |
| RSG Forest Products - Liberal Sawmill<br>28890 S Hwy 213<br>Molalla 97038 | 1806 | ammonium chloride<br>pentachlorophenol | Sediment<br>Soil<br>Surface Water | 1 | SAS |
| Rasmussen Paints<br>12655 SW Beaverdam RD | 153 | ethylbenzene<br>xylenes | | 1 | SAS |



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SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Rasmussen Paints (Cont.)<br><br>Beaverton 97005 | | | | | |
| Redi-Strip of Oregon<br>9940 N Vancouver WAY<br>Portland 97217 | 276 | lead | Soil | 1 | SRS |
| Remoir Property<br>15000 NW Oak Ridge RD<br>Yamhill 97148 | 1054 | dioxins | Soil | 1 | SAS |
| Reynolds Metal Co.<br>5100 NE Sundial RD<br>Troutdale 97060 | 154 | arsenic<br>beryllium<br>cyanide (as ion)<br>fluoride (as ion)<br>polyaromatic hydrocarbons (pah) | Groundwater<br>Sediment<br>Soil | 2 | SRS |
| Rhone-Poulenc - N Marine DR<br>4429 N Suttle RD<br>Portland 97217 | 165 | arsenic<br>benzene<br>bhc,alpha-<br>ddt,p,p'-<br>dieldrin | | 2 | SRS |
| Rhone-Poulenc Inc. - NW St. Helens RD<br>6200 NW St. Helens RD<br>Portland 97210 | 155 | benzene<br>d,2,4-<br>db,2,4-<br>dichlorobenzene,1,2-<br>dichlorophenol,2,4-<br>dichlorophenol,2,6-<br>dichloroprop<br>ethylbenzene<br>mcpa<br>methylene chloride<br>phenols<br>t,2,4,5-<br>tetrachlorodibenzo-p-dioxin,2,3,7,8-<br>toluene<br>trichloroethylene<br>trichlorophenol,2,4,6-<br>xylenes | | 2 | SRS |
| Riverfront Research Park<br><br>Eugene 97403 | 1018 | polyaromatic hydrocarbons (pah) | Soil | 2 | VCS |



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SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Rivergate Auto Wrecking - U Pull It Division<br>12104 N Columbia BLVD<br>Portland 97203 | 2056 | ethylene glycol<br>oil - waste | | 1 | SAS |
| SP Anodizing<br>7415 SE Johnson Creek BLVD<br>Portland 97206 | 279 | arsenic<br>cadmium<br>chromium<br>cobalt<br>copper<br>lead<br>magnesium<br>mercury<br>nickel<br>pcb 1260<br>toluene<br>xylenes<br>zinc | Sediment<br>Soil | 1 | VCS |
| Safety-Kleen - Clackamas<br>11843 SE Hwy 212<br>Clackamas 97015 | 1315 | dichloroethane,1,1-<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>tetrachloroethylene<br>toluene<br>total petroleum hydrocarbons (tph)<br>trichloroethanes<br>trichloroethylene<br>xylenes | Groundwater | 1 | RCRA |
| Safeway Store #308<br>70 E Oak ST<br>Lebanon 97355 | 1694 | tetrachloroethylene<br>trichloroethylene<br>volatile organic compounds (voc) | Groundwater | 2 | VCS |
| anta Fe Pacific Pipeline - Eugene Terminal<br>1765 Prairie RD<br>Eugene 97402 | 1355 | diesel - fuel oil | Groundwater<br>Soil | 1 | SAS |
| Schnitzer - Moody AVE Units A, B & C<br>Moody AVE (South Waterfront)<br>Portland 97201 | 875 | dde,p,p'-<br>ddt,p,p'-<br>lead<br>mercury<br>pcbs<br>polyaromatic hydrocarbons (pah)<br>zinc | Soil | 3 | SRS |
| Schnitzer Property - N Kerby AVE | 1050 | chromium | Groundwater | 1 | SAS |

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SCOEPA00010473

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Schnitzer Property - N Kerby AVE (Cont.)<br>8520 N Kerby AVE<br>Portland 97217 | | lead<br>pcb 1221<br>total petroleum hydrocarbons (tph) | Soil | | |
| Schnitzer Steel - Eugene<br>111 Hwy 99N<br>Eugene 97402 | 1687 | benzo(a)anthracene<br>benzo(b)fluoranthene<br>chromium<br>chrysene<br>indeno(1,2,3-cd)pyrene<br>lead | Sediment | 1 | SAS |
| Schoen Electric<br>626 Queen AVE SW<br>Albany 97321 | 1195 | dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>dichloroethylene,1,2-trans-<br>trichloroethylene<br>vinyl chloride | Groundwater | 1 | VCS |
| Sears TBA Store<br>942 Olive ST<br>Eugene 97401 | 1143 | pcbs<br>tetrachloroethylene<br>trichloroethylene | Soil | 1 | SAS |
| Selmet Inc.<br>33992 Seven Mile LN<br>Albany 97321 | 342 | dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>tetrachloroethylene<br>trichloroethylene<br>trichloromonofluoromethane<br>vinyl chloride | Groundwater<br>Soil | 2 | VCS |
| Shell Bulk Terminal (Former) - Eugene<br>245 Jackson ST<br>Eugene 97402 | 1566 | benzene<br>diesel - fuel oil<br>gasoline | Groundwater<br>Soil | 1 | SAS |
| Shopping Center Property - Nature's Fresh NW<br>3535 NE 15th AVE<br>Portland 0 | 1855 | tetrachloroethylene | Groundwater<br>Soil | 1 | VCS |
| Silver Lake Ranger Station<br>Hwy 31<br>Silver Lake 97638 | 1971 | acenaphthene<br>benzo(a)anthracene<br>chrysene<br>fluoranthene<br>fluorene<br>methylnaphthalene,2-<br>pentachlorophenol<br>pyrene<br>total petroleum hydrocarbons (tph) | Soil | 1 | VCS |

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SCOEPA00010474

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Simplot Soil Builders<br>213 Oregon ST E<br>Vale 97918 | 1216 | benzene<br>dichloropropane,1,2-<br>petroleum hydrocarbons | Groundwater<br>Soil | 2 | VCS |
| Slavin RD Landfill Site<br>SW Slavin RD near intersection w/SW Seymour RD<br>Portland 97201 | 1520 | hydrocarbons | Soil | 1 | VCS |
| mith Metal Industries<br>6819 SE Johnson Creek BLVD<br>Portland 97206 | 1690 | arsenic<br>chromium<br>lead<br>nickel | Soil<br>Surface Water | 1 | SAS |
| Soil Contamination - NE Transport WAY<br>5700 NE Transport WAY<br>Portland 97218 | 1065 | bunker - fuel oil | Soil | 1 | SAS |
| South Waterfront Redevelopment<br>SW River Drive<br>Portland 97201 | 602 | lead<br>oil or fuel related compounds | Groundwater<br>Soil | 2 | VCS |
| Southern Oregon Tallow Co.<br>10175 Agate RD<br>Eagle Point 97524 | 1252 | lead<br>oil or fuel related compounds | Soil | 1 | VCS |
| Southern Pacific RR Right-Of-Way - Tigard<br>SPPR Right-Of-Way west of 8900 SW Commercial ST<br>Tigard 97223 | 1597 | aldrin<br>ddt,p,p'-<br>dieldrin | Soil | 2 | VCS |
| Southern Pacific Transportation Co. - E Milwaukie<br>SW of SE Harmony RD & SE 82nd AVE<br>Milwaukie 97222 | 1190 | dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>tetrachloroethylene<br>trichloroethylene<br>vinyl chloride | Groundwater<br>Soil<br>Surface Water | 3 | SRS |
| Southern Pacific Transportation Co. - Eugene Yards<br>341 Bethel DR<br>Eugene 97402 | 312 | oil - lubricating | | 2 | VCS |
| Springfield Airport (Abandoned)<br>SW corner of 28th ST & Olympic ST<br>Springfield 97478 | 239 | ddd,p,p'-<br>dde,p,p'-<br>ddt,p,p'-<br>dieldrin<br>endosulfan i<br>endosulfan sulfate | Soil | 2 | SRS |



SCOEPA00010475

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Springfield Airport (Abandoned) (Cont.) | | endrin<br>heptachlor<br>heptachlor epoxide<br>methoxychlor | | | |
| St. John's Landfill<br>9363 N Columbia BLVD<br>Portland 97203 | 164 | acetone<br>arsenic<br>barium<br>benzene<br>bhc,gamma-<br>carbon disulfide<br>carbon tetrachloride<br>chlorobenzene<br>chloroethane<br>chromium<br>dichlorobenzene,1,4-<br>dichloroethane,1,1-<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>ethylbenzene<br>lead<br>mercury<br>methylene chloride<br>tetrachloroethylene<br>toluene<br>trichloroethane,1,1,1-<br>trichloroethylene<br>vinyl chloride<br>xylenes | Groundwater<br>Other | 2 | SW |
| St. Johns - Keeler #2 Right-Of-Way<br>2N/1W/S35<br>Portland 97203 | 1067 | pcb 1221<br>petroleum hydrocarbons | Soil | 1 | SAS |
| Stanley Proto Tool (SPT)<br>10330 SE 32nd AVE<br>Milwaukie 97222 | 1171 | chromium<br>dichloroethylene,1,2-cis-<br>nickel<br>tetrachloroethylene<br>total petroleum hydrocarbons (tph)<br>trichloroethylene | Groundwater<br>Soil | 2 | VCS |
| Sulzer Bingham Pumps<br>2800 NW Front AVE<br>Portland 97210 | 1235 | benzene<br>dichloroethylene,1,2-cis-<br>ethylbenzene<br>fuel oil | Groundwater<br>Soil | 1 | SAS |



SCOEPA0001047

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Sulzer Bingham Pumps (Cont.) | | tetrachloroethylene<br>toluene<br>trichloroethylene<br>vinyl chloride<br>xylenes | | | |
| Sunset Fuel Company<br>12515 SW Grant AVE<br>Tigard 97223 | 2006 | butylbenzene,n-<br>butylbenzene,sec-<br>butylbenzene,tert-<br>diesel - fuel oil<br>isopropyltoluene,p-<br>naphthalene<br>propylbenzene,n-<br>trimethylbenzene,1,2,4- | Soil | 2 | VCS |
| Surgichrome Inc.<br>16569 SE 115th AVE<br>Clackamas 97015 | 1526 | chromium | Groundwater<br>Sediment<br>Soil<br>Surface Water | 2 | SRS |
| Swift Adhesives<br>18408 NE San Rafael ST<br>Portland 97230 | 884 | carbon disulfide<br>dichloroethane,1,1-<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>methylene chloride<br>tetrachloroethane,1,1,1,2-<br>trichloroethane,1,1,1-<br>trichloroethylene | | 3 | SRS |
| TRUAX Bulk Petroleum Storage Facility<br>1414 Salem AVE<br>Albany 97321 | 1961 | benzene<br>diesel - fuel oil<br>gasoline | Groundwater<br>Soil | 1 | SAS |
| Tacoma ST Overpass<br>8217 SE McLoughlin BLVD<br>Portland 97202 | 1159 | benzene<br>chlorobenzene<br>dichlorobenzene,1,4-<br>dichloroethane,1,2-<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-trans-<br>ethylbenzene<br>tetrachloroethylene<br>toluene<br>trichloroethane,1,1,1-<br>trichloroethane,1,1,2-<br>trichloroethylene | Groundwater | 2 | VCS |



SCOEPA00010477

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Tacoma ST Overpass (Cont.) | | vinyl chloride<br>xylene,o-<br>xylenes | | | |
| Taylor's Landing<br>7164 Alsea Hwy<br>Waldport 97394 | 1983 | gasoline | Soil | 1 | SAS |
| Tektronix Inc. - Beaverton Campus<br>13700 SW Karl Braun DR<br>Beaverton 97077 | 167 | chromium<br>copper<br>dichloroethylene,1,2-trans-<br>lead<br>nickel<br>tetrachloroethylene<br>trichloroethylene<br>zinc | Groundwater<br>Sediment | 1 | SAS |
| Tektronix Inc. - Building 93<br>13645 NW Science Park RD<br>Aloha 97006 | 1194 | dichloroethylene,1,2-cis-<br>dichloroethylene,1,2-trans-<br>trichloroethylene<br>vinyl chloride | Groundwater<br>Soil | 1 | SAS |
| Teledyne Wah Chang Albany<br>1600 NE Old Salem RD<br>Millersburg 97321 | 315 | barium<br>chromium<br>dichloroethane,1,1-<br>dichloroethylene,1,1-<br>hexachlorobenzene<br>lead<br>methyl-2-pentanone,4-<br>nickel<br>radium<br>trichloroethane,1,1,1-<br>trichloroethylene<br>vinyl chloride | Groundwater<br>Sediment<br>Soil | 2 | SRS |
| Temco Metal Products Co.<br>10240 SE Mather RD<br>Clackamas 97015 | 1148 | dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>dichloroethylene,1,2-trans-<br>tetrachloroethylene<br>trichloroethane,1,1,1-<br>trichloroethane,1,1,2-<br>trichloroethylene<br>vinyl chloride | | 1 | SAS |
| Texaco Portland Terminal | 169 | acenaphthene | Groundwater | 2 | VCS |



SCOEPA00010478

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Texaco Portland Terminal (Cont.)<br>3800 NW St. Helens RD<br>Portland 97210 | | acenaphthylene<br>anthracene<br>arsenic<br>benzene<br>benzo(a)anthracene<br>benzo(a)pyrene<br>benzo(b)fluoranthene<br>benzo(ghi)perylene<br>benzo(k)fluoranthene<br>chrysene<br>dibenzo(a,h)anthracene<br>ethylbenzene<br>fluoranthene<br>fluorene<br>indeno(1,2,3-cd)pyrene<br>lead<br>naphthalene<br>phenanthrene<br>pyrene<br>toluene<br>total petroleum hydrocarbons (tph)<br>xylenes | Soil | | |
| Tillamook Farmers Co-op<br>1920 Main AVE N (Hwy 101 N)<br>Tillamook 97141 | 1410 | acenaphthene<br>anthracene<br>benzene<br>diesel - fuel oil<br>ethylbenzene<br>fluoranthene<br>fluorene<br>gasoline<br>lead<br>naphthalene<br>phenanthrene<br>pyrene<br>toluene<br>xylenes | Groundwater<br>Soil | 2 | VCS |
| Timber Harvesting Equipment Sales Inc.<br>1102 SE 2nd ST<br>Canby 97013 | 1604 | cadmium<br>lead<br>methyl ethyl ketone<br>oil - waste | Groundwater<br>Soil<br>Surface Water | 1 | SAS |
| Tongue Point Landfill<br>Tongue Point | 171 | arsenic<br>bis(2-ethylhexyl)phthalate | | 2 | VCS |

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SCOEPA00010479

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Tongue Point Landfill (Cont.)<br><br>Astoria 97103 | | cadmium<br>chromium<br>copper<br>lead<br>mercury<br>pcb 1254<br>total petroleum hydrocarbons (tph) | | | |
| Toyota Motor Sales<br>10400 N Lombard ST<br>Portland 97203 | 172 | petroleum<br>volatile organic compounds (voc) | | 1 | SAS |
| Transmission Supply Co.<br>10709 SE Knight ST<br>Happy Valley 97266 | 1574 | petroleum hydrocarbons | Soil<br>Surface Water | 1 | SAS |
| Truax-Harris Texaco Service Station - Forest Grove<br>3510 Pacific DR<br>Forest Grove 97116 | 1634 | gasoline | Soil | 1 | VCS |
| Trumbull Asphalt Plant<br>3605 NW 35th AVE<br>Portland 97210 | 1160 | total petroleum hydrocarbons (tph) | Groundwater<br>Soil | 1 | SAS |
| Trus Joist MacMillan - Junction City<br>93747 Hwy 99S<br>Junction City 97448 | 1714 | toluene | Groundwater<br>Soil | 1 | VCS |
| Tualatin River Pipeline Leak<br>2S/1W/S16c<br>Unknown City0 | 1682 | benzene<br>ethylbenzene<br>gasoline<br>petroleum hydrocarbons<br>toluene<br>xylenes | Groundwater<br>Soil | 2 | VCS |
| Tugman Park Landfill<br>18S/3W/S8<br>Eugene 97405 | 843 | arsenic<br>lead<br>pcb 1221<br>tetrachloroethylene<br>zinc | Soil<br>Surface Water | 2 | SRS |
| U & R Express<br>2717 Orindale RD<br>Klamath Falls 97601 | 1450 | d001 acidic hazardous waste<br>diesel - fuel oil<br>solvent - waste | Soil | 1 | SAS |



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SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| U.S. West Argyle Service Center<br>2111 NE Argyle ST<br>Portland 97211 | 270 | chlorotoluene,o-<br>chrysene<br>dichloroethane,1,1-<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>diesel - fuel oil<br>tetrachloroethylene<br>toluene<br>trichloroethane,1,1,1- | Groundwater<br>Soil | 1 | SAS |
| US Army COE - Portland Moorings<br>8010 NW St. Helens RD<br>Portland 97210 | 1641 | acenaphthene<br>anthracene<br>arsenic<br>benzo(a)anthracene<br>benzo(a)pyrene<br>benzo(b)fluoranthene<br>benzo(ghi)perylene<br>chromium<br>chrysene<br>copper<br>ddd,p,p'-<br>ddt,p,p'-<br>dibenzo(a,h)anthracene<br>dibenzofuran<br>dieldrin<br>fluoranthene<br>fluorene<br>indeno(1,2,3-cd)pyrene<br>lead<br>naphthalene<br>pcbs<br>petroleum hydrocarbons<br>phenanthrene<br>pyrene<br>tributyltin<br>zinc | Sediment<br>Soil | 1 | VC |
| Umatilla Army Depot Activity<br>I-84 & Exit 178<br>Hermiston 97838 | 514 | cyclotrimethylenetrinitramine<br>dinitrotoluene,2,6-<br>lead<br>trinitrotoluene,2,4,6- | Groundwater<br>Soil | 3 | SRS |
| Union Oil Service Station - Tillamook<br>540 N Main<br>Tillamook 97141 | 1916 | gasoline | | 1 | SAS |

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SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Union Pacific RR - Albina Yard<br>2745 N Interstate AVE<br>Portland 97227 | 178 | petroleum | Soil<br>Surface Water | 1 | SAS |
| Union Pacific RR - Crescent Lake<br>Wye Track<br>Crescent Lake 97425 | 1466 | bunker - fuel oil | Groundwater<br>Soil | 2 | VCS |
| Union Pacific RR - K. Falls<br>1585 Oak ST<br>Klamath Falls 97601 | 297 | benzene<br>diesel - fuel oil<br>tetrachloroethylene | Groundwater<br>Soil | 2 | VCS |
| Union Pacific RR - La Grande<br>Jefferson ST & Fir ST<br>La Grande 97850 | 631 | acenaphthene<br>benzene<br>fluorene<br>petroleum<br>phenanthrene<br>total petroleum hydrocarbons (tph) | Groundwater<br>Soil | 3 | SRS |
| Union Pacific RR - Tar Pits<br>RR tracks adjacent to Hwy 30<br>La Grande 97850 | 1909 | bunker - fuel oil<br>petroleum<br>tar waste | Soil | 1 | VCS |
| Union Pacific RR - The Dalles<br>Tie Plant RD<br>The Dalles 97058 | 54 | arsenic<br>benzene<br>benzo(a)anthracene<br>benzo(k)fluoranthene<br>chrysene<br>naphthalene<br>pentachlorophenol<br>polyaromatic hydrocarbons (pah)<br>toluene<br>xylenes | Groundwater<br>Sediment<br>Soil | 3 | SRS |
| Union Pacific RR Right of Way - Columbia Gorge<br>1N/5E/S13<br>Bridal Veil 97010 | 179 | lead<br>oil - lubricating | | 1 | SAS |
| Union Pacific Railroad - Ashland<br>North of "A" ST, from Pioneer east to 8th<br>Ashland 97520 | 1146 | arsenic<br>lead<br>oil or fuel related compounds<br>xylenes | Groundwater<br>Soil | 2 | VCS |
| Union Station - Parcel B South<br>Between Union Station & Naito Parkway | 1885 | arsenic<br>lead | Groundwater<br>Soil | 3 | VCS |

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SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Union Station - Parcel B South (Cont.) | | polyaromatic hydrocarbons (pah)<br>total petroleum hydrocarbons (tph) | | | |
| Portland 0 | | | | | |
| Union Station - Track #5<br>Union Station<br>Portland 97209 | 1414 | acenaphthene<br>acenaphthylene<br>anthracene<br>benzo(a)anthracene<br>benzo(a)pyrene<br>benzo(b)fluoranthene<br>benzo(ghi)perylene<br>benzo(k)fluoranthene<br>chrysene<br>dibenzo(a,h)anthracene<br>diesel - fuel oil<br>ethylbenzene<br>fluoranthene<br>fluorene<br>indeno(1,2,3-cd)pyrene<br>naphthalene<br>phenanthrene<br>pyrene<br>toluene<br>xylenes | Groundwater<br>Soil | 2 | VCS |
| United Chrome Products Inc. (UCP)<br>2000 Airport RD<br>Corvallis 97333 | 317 | chromium, hexavalent | Groundwater<br>Sediment<br>Soil<br>Surface Water | 4 | SRS |
| Unocal Bulk Plant #0193<br>453 SW 2nd AVE<br>Estacada 97023 | 1642 | benzene<br>diesel - fuel oil<br>ethylbenzene<br>gasoline<br>toluene<br>xylenes | | 1 | SAS |
| Unocal Bulk Plant #0333<br>1459 S 6th ST<br>Klamath Falls 97601 | 1221 | benzene<br>ethylbenzene<br>petroleum hydrocarbons<br>total hydrocarbons (as diesel)<br>total petroleum hydrocarbons (tph) | Groundwater<br>Soil | 2 | VCS |
| Unocal Bulk Plant #0639<br>155 E Railroad ST | 1343 | benzene | Groundwater | 1 | SAS |



SCOEPA00010483

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Unocal Bulk Plant #0639 (Cont.)<br><br>Reedsport 97467 | | | | | |
| Unocal Bulk Plant #0758<br>855 Columbia River Hwy (US Hwy 30)<br>St. Helens 0 | 1615 | diesel - fuel oil<br>gasoline<br>total petroleum hydrocarbons (tph) | Soil | 1 | SAS |
| Unocal Bulk Plant #0782<br>2802 5th ST<br>Tillamook 97141 | 1742 | benzene<br>diesel - fuel oil<br>ethylbenzene<br>gasoline<br>toluene<br>xylenes | Groundwater<br>Soil | 1 | SAS |
| Unocal Service Station #3838<br>11 Coburg RD<br>Eugene 97401 | 1612 | tetrachloroethylene | Groundwater | 1 | SAS |
| Unocal Service Station #4580<br>30085 SW Parkway AVE<br>Wilsonville 97070 | 1234 | dichlorobenzene,1,2-<br>ethylbenzene<br>pcbs<br>tetrachloroethylene<br>toluene<br>total petroleum hydrocarbons (tph)<br>xylenes | Soil | 1 | SAS |
| Unocal Service Station #5133<br>5065 SW Scholls Ferry RD<br>Portland 97225 | 1429 | benzene<br>diesel - fuel oil<br>gasoline<br>naphthalene | Groundwater<br>Soil | 1 | SAS |
| Unocal Service Station #5958<br>8510 SW Terwilliger BLVD<br>Portland 97219 | 1069 | dichloroethylene,1,2-cis-<br>tetrachloroethylene<br>trichloroethylene | Groundwater | 1 | SAS |
| Unocal Terminal 0022 (Former)<br>256 Marine DR<br>Astoria 97103 | 1646 | acenaphthylene<br>ammonia<br>anthracene<br>benzene<br>benzo(a)anthracene<br>benzo(a)pyrene<br>benzo(b)fluoranthene<br>benzo(ghi)perylene<br>benzo(k)fluoranthene | Groundwater<br>Soil | 2 | VCS |



SCOEPA00010484

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Unocal Terminal 0022 (Former) (Cont.) | | chrysene<br>cyanide (as ion)<br>dibenzo(a,h)anthracene<br>dibenzofuran<br>diesel - fuel oil<br>ethylbenzene<br>fluoranthene<br>fluorene<br>gasoline<br>indeno(1,2,3-cd)pyrene<br>naphthalene<br>oil or fuel related compounds<br>phenanthrene<br>pyrene<br>toluene<br>xylenes | | | |
| Vadis Pole Yard<br>Vadis RD<br>North Plains 97133 | 109 | arsenic<br>benzo(a)anthracene<br>benzo(a)pyrene<br>chromium<br>chrysene<br>fluorene<br>naphthalene<br>pentachlorophenol<br>phenanthrene<br>pyrene | Groundwater<br>Soil | 2 | VCS |
| Valet Cleaners<br>15020 SE McLoughlin BLVD<br>Milwaukie 97267 | 1156 | tetrachloroethylene<br>trichloroethylene | Groundwater | 1 | SAS |
| Van Waters & Rogers<br>3950 NW Yeon AVE<br>Portland 97210 | 330 | benzene<br>chloroform<br>dichloroethane,1,2-<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>dichloroethylene,1,2-trans-<br>ethylbenzene<br>methylene chloride<br>styrene<br>tetrachloroethylene<br>toluene<br>trichloroethane,1,1,1-<br>trichloroethane,1,1,2- | Groundwater | 1 | SAS |



SCOEPA0010485

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Van Waters & Rogers (Cont.) | | trichloroethylene<br>vinyl chloride<br>xylenes | | | |
| VanOsten Properties - TL 701<br>21372 E Hwy 20*<br>Bend 97701 | 365 | pentachlorophenol | Sludge<br>Soil | 2 | VCS |
| Vanwest Oil Co. - Tax Lot 1503<br>2903 3rd ST<br>Tillamook 97141 | 1582 | benzene<br>ethylbenzene<br>toluene<br>xylenes | Groundwater | 1 | SAS |
| Viking Industries Inc.<br>18600 NE Wilkes RD<br>Portland 97230 | 885 | diesel - fuel oil | Groundwater<br>Soil | 2 | LUST |
| Wacker Siltronic Corp.<br>7200 NW Front AVE<br>Portland 97210 | 183 | benzene<br>benzo(a)anthracene<br>benzo(a)pyrene<br>benzo(b)fluoranthene<br>benzo(k)fluoranthene<br>chlorophenol<br>chrysene<br>dimethylphenol,2,4-<br>ethylbenzene<br>indeno(1,2,3-cd)pyrene<br>petroleum hydrocarbons<br>tetrachloroethylene<br>toluene<br>toluenediamine,2,4- | Groundwater<br>Soil | 1 | SAS |
| Wagstaff Battery Manufacturing Co.<br>2124 N Williams AVE<br>Portland 97227 | 1243 | lead<br>petroleum | Other<br>Soil | 2 | VCS |
| Warn Industries<br>13270 SE Pheasant CT<br>Milwaukie 97222 | 1118 | dichloroethane,1,2-<br>dichloroethanes<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>tetrachloroethylene<br>total hydrocarbons (as diesel)<br>total petroleum hydrocarbons (tph)<br>trichloroethane,1,1,1-<br>trichloroethane,1,1,2- | Groundwater<br>Soil | 2 | SRS |



SCOEPA0001048

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Warn Industries (Cont.) | | trichloroethylene | | | |
| Washington County Maintenance Facility<br>2470 SE River RD<br>Hillsboro 97123 | 1569 | diesel - fuel oil | Groundwater<br>Soil | 2 | VCS |
| Western Foundry Co.<br>8200 SW Hunziker RD<br>igard 97223 | 185 | cadmium<br>chromium<br>lead<br>oil or fuel related compounds<br>pcbs | Sediment<br>Soil | 2 | VCS |
| Westwood Corp.<br>3030 SW Moody AVE<br>Portland 97201 | 1923 | diesel - fuel oil<br>kerosene<br>lead | Soil | 1 | VC |
| Weyerhaeuser - Sycan Shop<br>36S/12E/S12<br>Beatty 97621 | 650 | dichloroethane,1,1-<br>diesel - fuel oil<br>ethylbenzene<br>gasoline<br>oil or fuel related compounds<br>tetrachloroethylene<br>toluene<br>trichloroethane,1,1,1-<br>trichloroethylene<br>xylenes | Groundwater<br>Soil | 2 | VCS |
| Weyerhaeuser - Tremont ST<br>3050 Tremont ST<br>North Bend 97459 | 527 | ammonium chloride<br>ethanol<br>pentachlorophenol | Groundwater<br>Soil | 1 | SAS |
| White King & Lucky Lass Uranium Mines<br>37S/19E/s30<br>Lakeview 97630 | 601 | arsenic<br>cadmium<br>manganese<br>molybdenum<br>uranium<br>zinc | Surface Water | 2 | SRS |
| Willamette Industries - Culp Creek RR Loading Area<br>Row River RD<br>Culp Creek 97427 | 1609 | benzo(a)anthracene<br>benzo(b)fluoranthene<br>chrysene | Groundwater | 1 | VCS |
| Willamette Oaks Building<br>6720 SW Macadam AVE<br>Portland 97219 | 883 | chlorinated solvents<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-cis- | Groundwater | 2 | SRS |

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SCOEPA00010487

SUMMARY OF
FACILITIES ON
DEQ CONFIRMED RELEASE LIST

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Willamette Oaks Building (Cont.) | | dichloroethylene,1,2-trans-<br>tetrachloroethylene<br>trichloroethylene<br>vinyl chloride | | | |
| Willamina Lumber Co. - Hampton Affiliate<br>Willamina Creek RD<br>Willamina 97396 | 1399 | diesel - fuel oil<br>oil - waste | Soil | 1 | SAS |
| Witco - Golden Bear Plant<br>2936 Hilyard AVE<br>Klamath Falls 97603 | 1751 | beryllium<br>chromium<br>lead<br>nickel<br>pcbs<br>total petroleum hydrocarbons (tph)<br>xylenes | Groundwater<br>Soil | 2 | VCS |
| XDP Inc.<br>4288 SE International WAY<br>Milwaukie 97222 | 1117 | dichloroethylene,1,2-cis-<br>tetrachloroethylene<br>trichloroethylene<br>vinyl chloride | Groundwater | 1 | SRS |
| Zidell Waterfront Property<br>Straddles the Ross Island Bridge on the west side of<br>Portland 97201 | 689 | antimony<br>arsenic<br>benzene<br>chromium<br>lead<br>nickel<br>oil or fuel related compounds<br>pcbs<br>polyaromatic hydrocarbons (pah)<br>tributyltin | Groundwater<br>Sediment<br>Soil | 2 | VCS |

TOTAL SITES : 364



SCOEPA00010488

# Summary of Facilities on DEQ Inventory

Oregon Department of Environmental Quality August 3, 1998

SCOEPA00010489

DEQ ENVIRONMENTAL CLEANUP SITE INFORMATION SYSTEM

SITES ADDED TO THE INVENTORY SINCE APRIL 23, 1998

| SITE NAME | SITE ID | SITE ADDRESS | ACTION CODE | START DATE | COMPLETION DATE |
|---|---|---|---|---|---|
| City of Oakridge Bald Knob Property | 234 | 48513 Hwy 58 Oakridge 97463 | LSI | 24JUL1998 | 24JUL1998 |
| Columbia Helicopters | 30 | 14452 Arndt RD NE Aurora 97002 | LSI | 11MAY1998 | 11MAY1998 |
| Louisiana Pacific - Snow Mountain Pine | 1998 | Hwy 20 S Hines 97738 | LSI | 16JUL1998 | 16JUL1998 |
| ORE-IDA Foods | 1447 | 175 NE 6th AVE Ontario 97914 | LSI | 16JUL1998 | 16JUL1998 |
| Old Dominion Carstar | 1731 | 1060 W 1st AVE Eugene 97402 | LSI | 22JUL1998 | 22JUL1998 |
| Pacific Car Crushing | 2057 | 12122 N Columbia BLVD Portland 97203 | LSI | 24JUL1998 | 24JUL1998 |
| Parrett Mountain Sludge Lagoons | 309 | T3S/R2W/Section 23 Newberg 97132 | LSI | 15JUN1998 | 15JUN1998 |
| Safeway Store #308 | 1694 | 70 E Oak ST Lebanon 97355 | LSI | 28JUL1998 | 28JUL1998 |
| Union Pacific RR - Crescent Lake | 1466 | Wye Track Crescent Lake 97425 | LSI | 28JUL1998 | 28JUL1998 |
| Union Pacific RR - K. Falls | 297 | 1585 Oak ST Klamath Falls 97601 | LSI | 28JUL1998 | 28JUL1998 |

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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| 217 Distribution Center - Building D<br>11000 SW 11th AVE, Building D<br>Beaverton 97005 | 1969 | dichloroethylene,1,2-cis-<br>tetrachloroethylene<br>trichloroethylene<br>vinyl chloride | Groundwater<br>Soil | 2 | VCS |
| A-dec Inc.<br>2601 Crestview DR<br>Newberg 97132 | 1184 | benzene<br>dichloroethane,1,1-<br>dichloroethylene,1,1-<br>tetrachloroethylene<br>trichloroethane,1,1,1-<br>trichloroethylene<br>xylenes | Groundwater<br>Soil | 2 | VCS |
| AB Finishing Tech<br>6724 NE 46th AVE<br>Portland 97218 | 871 | chromium | Groundwater | 2 | VCS |
| ANRFS Holdings Inc.<br>3333 NW 35th AVE<br>Portland 97210 | 1820 | benzene<br>dichloroethane,1,1-<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>ethylbenzene<br>methylene chloride<br>tetrachloroethylene<br>toluene<br>trichloroethane,1,1,1-<br>trichloroethylene<br>trimethylbenzene,1,2,4-<br>vinyl chloride<br>xylenes | Groundwater | 1 | SAS |
| ARCO Bulk Terminal<br>9930 NW St. Helens RD<br>Burlington 97231 | 1528 | diesel - fuel oil<br>gasoline | Groundwater<br>Soil | 1 | SAS |
| Alkali Lake<br>30S/23E/S18<br>Alkali Lake 97640 | 291 | phenols<br>tetrachlorodibenzo-p-dioxin,2,3,7,8-<br>toluenediamine,2,4- | Groundwater<br>Soil | 2 | SRS |
| Apollo Metal Finishing Inc.<br>7525 SE Johnson Creek BLVD<br>Portland 97206 | 1 | arsenic<br>chromium<br>copper<br>cyanide (as ion)<br>dimethyl phthalate<br>lead | Soil | 1 | VC |



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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Apollo Metal Finishing Inc. (cont.) | 1 | mercury<br>pcb 1254<br>pcb 1260<br>xylenes<br>zinc | | 1 | |
| Auric Enterprises<br>10200 NE 6th DR<br>Portland 97211 | 96 | pcb 1254 | Soil | 1 | SAS |
| Baker Property<br>30301 Riverview DR<br>Junction City 97448 | 755 | d,2,4-<br>ddt,p,p'-<br>parathion<br>silvex | Sediment<br>Soil | 1 | SAS |
| Balteau Standard<br>8001 Table Rock RD<br>White City 97503 | 533 | acetone<br>dichlorobenzenes<br>dichloroethanes<br>dichloroethylenes<br>methyl-2-pentanone,4-<br>methylene chloride<br>pcbs<br>petroleum hydrocarbons<br>tetrachloroethylene<br>trichloroethanes<br>trichloromonofluoromethane<br>xylenes | Groundwater<br>Soil | 2 | VCS |
| Bank of California - Astoria<br>927 Marine DR<br>Astoria 97103 | 1467 | diesel - fuel oil<br>gasoline<br>oil - waste | Soil | 2 | VCS |
| Baron Blakeslee<br>5920 NE 87th AVE<br>Portland 97211 | 1274 | acetone<br>methylene chloride<br>tetrachloroethylene<br>trichloroethane,1,1,1-<br>trichloroethylene | Groundwater<br>Soil | 1 | RCRA |
| Beaverton Mall<br>3205 SW Cedar Hills BLVD<br>Beaverton 97005 | 691 | dichloroethylene,1,2-cis-<br>tetrachloroethylene<br>trichloroethylene | Groundwater | 2 | VCS |
| Bend Millwork Systems (BMS)<br>62845 Boyd Acres RD<br>Bend 97701 | 323 | bis(2-ethylhexyl)phthalate<br>pentachlorophenol<br>trichloroethanes | Sludge<br>Soil<br>Surface Wate | 2 | VCS |

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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Bend Millwork Systems (BMS) (cont.) | 323 | trichloroethylene | | 2 | |
| Bergsoe Metal Corp.<br>444 Port AVE<br>St. Helens 97051 | 12 | cadmium<br>lead | Groundwater<br>Soil | 4 | SRS |
| Blackwell RD Drug Lab<br>9464 Blackwell RD<br>Central Point 97502 | 1032 | dimethyl-3-pentanone,2,4-<br>dimethylhydroperoxide,1,1-<br>dimethylphenethylamine,alpha,alpha- | Soil | 1 | SAS |
| Blount Inc.<br>4909 SE International WAY<br>Milwaukie 97222 | 267 | chromium<br>dichloroethane,1,2-<br>dichloroethylene,1,2-cis-<br>methylene chloride<br>tetrachloroethylene<br>trichloroethylene<br>vinyl chloride<br>zinc | Groundwater<br>Other<br>Soil | 2 | VCS |
| Blue Mountain Forest Products<br>800 Eagle ST<br>Long Creek 97856 | 1950 | benzene<br>total petroleum hydrocarbons (tph) | Soil | 4 | VCS |
| Boeing of Portland<br>19000 NE Sandy BLVD<br>Portland 97230 | 13 | dichloroethylene,1,1-<br>trichloroethane,1,1,1-<br>trichloroethylene | Groundwater<br>Soil | 1 | SRS |
| Boise Cascade - Joseph Mill<br>600 W Joseph ST (Hwy 82)<br>Joseph 97846 | 1661 | chromium<br>lead<br>petroleum | Groundwater<br>Soil | 3 | VCS |
| Bors Property<br>18247 S Grasle RD<br>Oregon City 97045 | 901 | pcb 1221 | Soil | 1 | VCS |
| Brogoitti Elevator Corp. - North<br>150 Columbia ST<br>Helix 97835 | 1645 | pesticides | | 1 | SAS |
| Carlton Co.<br>3901 SE Naef RD<br>Oak Grove 97268 | 1035 | dichloroethylene,1,1-<br>tetrachloroethane,1,1,1,2-<br>toluene<br>trichloroethylene<br>vinyl chloride | Groundwater<br>Soil | 2 | SRS |



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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Cascade Chemicals Inc.<br>16081 SE Evelyn ST<br>Clackamas 97015 | 1352 | cumene<br>ethylbenzene<br>methylene chloride<br>naphthalene<br>propylbenzene,n-<br>solvents<br>tetrachloroethylene<br>toluene<br>trichloroethylene<br>trimethylbenzene,1,2,4-<br>xylenes | Groundwater<br>Other<br>Soil | 1 | SAS |
| Cascade Corp.<br>2201 NE 201st DR<br>Troutdale 97060 | 635 | arsenic<br>chromium<br>copper<br>cyanide (as ion)<br>dichloroethylene,1,2-cis-<br>methylene chloride<br>nickel<br>oil - lubricating<br>tetrachloroethane,1,1,1,2-<br>tetrachloroethylene<br>toluene<br>trichloroethane,1,1,1-<br>trichloroethylene<br>vinyl chloride | Groundwater<br>Soil<br>Surface Wate | 3 | SRS |
| Catellus Development Corp. - Milwaukie<br>SE 37th AVE & SE Monroe ST<br>Milwaukie 97222 | 887 | petroleum hydrocarbons<br>polyaromatic hydrocarbons (pah)<br>volatile organic compounds (voc) | Groundwater<br>Soil | 2 | VCS |
| Chambers Fuel Oil Inc.<br>400 California AVE<br>North Bend 97459 | 22 | total hydrocarbons (as diesel) | Groundwater<br>Soil | 1 | SRS |
| Charles H. Lilly Co.<br>7737 NE Killingsworth ST<br>Portland 97218 | 102 | aldrin<br>benzene<br>bhc,gamma-<br>chlordane<br>ddd,p,p'-<br>dde,p,p'-<br>ddt,p,p'-<br>dicamba<br>dichloroprop<br>dieldrin | Groundwater<br>Soil | 1 | SAS |



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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Charles H. Lilly Co. (cont.) | 102 | ethylbenzene<br>fluoranthene<br>pentachlorophenol<br>t,2,4,5-<br>toluene<br>toluenediamine,2,4-<br>total petroleum hydrocarbons (tph)<br>toxaphene<br>xylenes | | 1 | |
| Chemcentral Corp.<br>10821 N Lombard ST<br>Portland 97203 | 878 | dichloroethane,1,1-<br>dichloroethylene,1,2-cis-<br>ethylbenzene<br>tetrachloroethylene<br>toluene<br>trichloroethane,1,1,1-<br>trichloroethylene<br>volatile organic compounds (voc)<br>xylenes | Groundwater<br>Soil | 2 | VCS |
| Chevron Bulk Plant - Coos Bay<br>2640 N Bayshore<br>Coos Bay 97420 | 542 | gasoline<br>oil or fuel related compounds | Groundwater | 2 | VCS |
| Chevron USA - Adams Terminal<br>Wild Horse Creek<br>Adams 97810 | 675 | oil or fuel related compounds | Groundwater | 2 | VCS |
| Chevron USA - Baker City Terminal<br>3370 17th ST<br>Baker City 97814 | 664 | benzene<br>toluene<br>total petroleum hydrocarbons (tph)<br>xylenes | Groundwater<br>Soil | 2 | VCS |
| Chiloquin Forest Products<br>Blocklinger ST (end of)<br>Chiloquin 97624 | 1213 | oil - waste<br>total petroleum hydrocarbons (tph) | Groundwater<br>Soil | 1 | SRS |
| City of Oakridge Bald Knob Property<br>48513 Hwy 58<br>Oakridge 97463 | 234 | benzene<br>dioxins<br>pcb 1221<br>pcbs<br>pentachlorophenol<br>petroleum hydrocarbons | Groundwater<br>Soil | 2 | VCS |
| Columbia American Plating Co. | 29 | benzo(a)anthracene | Soil | 1 | SAS |



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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Columbia American Plating Co. (cont.)<br>3003 NW 35th AVE<br>Portland 97210 | 29 | benzo(a)pyrene<br>benzo(b)fluoranthene<br>benzo(ghi)perylene<br>benzo(k)fluoranthene<br>cadmium<br>chromium<br>chrysene<br>cyanide (as ion)<br>hydrochloric acid<br>indeno(1,2,3-cd)pyrene<br>tetrachloroethylene<br>trichloroethylene<br>zinc | | 1 | |
| Columbia Helicopters<br>14452 Arndt RD NE<br>Aurora 97002 | 30 | chromium<br>dichloroethylene,1,1-<br>methylene chloride<br>trichloroethane,1,1,1-<br>trichloroethylene | Groundwater<br>Soil | 3 | SRS |
| Columbia Slough<br>31.5 miles of waterway over an 18 mile stretch to<br>Portland Oia River. | 1283 | aluminum<br>antimony<br>arsenic<br>cadmium<br>chromium<br>cobalt<br>copper<br>dde,p,p'-<br>iron<br>lead<br>manganese<br>mercury<br>nickel<br>pcbs<br>polyaromatic hydrocarbons (pah)<br>selenium<br>titanium<br>toluene<br>zinc | Sediment | 2 | SRS |
| Columbia Steel/Joslyn Sludge Pond<br>10580 N Macrum AVE<br>Portland 97203 | 104 | acenaphthylene<br>anthracene<br>benzene<br>benzo(a)anthracene<br>dibenzofuran | Groundwater<br>Soil | 4 | SRS |



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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Columbia Steel/Joslyn Sludge Pond (cont.) | 104 | fluoranthene<br>fluorene<br>naphthalene<br>pentachlorophenol<br>phenanthrene<br>pyrene<br>toluene | | 4 | |
| Coos - Curry Electric Co-op<br>74 W 1st ST<br>Coquille 97423 | 1107 | total petroleum hydrocarbons (tph) | Soil | 2 | VCS |
| Cornell Pump<br>2323 SE Hanna Harvester DR<br>Milwaukie 97222 | 1093 | dichloroethane,1,1-<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-trans-<br>tetrachloroethylene<br>toluene<br>total petroleum hydrocarbons (tph)<br>trichloroethane,1,1,1-<br>trichloroethylene<br>xylenes | Groundwater<br>Other<br>Soil | 2 | VCS |
| Cornucopia Mine Tailings<br>7S/45E/S27<br>Cornucopia 97834 | 1039 | arsenic<br>cyanide (as ion)<br>lead<br>mercury | Soil | 2 | VCS |
| Crescent Mini Mart<br>Hwy 97 Milepost 185.3<br>Crescent 97733 | 1718 | petroleum | Groundwater<br>Soil | 2 | SRS |
| Crystal Lite Manufacturing Co.<br>11971 SW Herman RD<br>Tualatin 97062 | 107 | dichloroethane,1,1-<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>tetrachloroethylene<br>trichloroethane,1,1,1-<br>trichloroethylene | Groundwater<br>Soil | 2 | VCS |
| DAW Forest Products Co.<br>SE Wilson AVE (foot of)<br>Bend 97709 | 1451 | acetone<br>cresol,4-<br>lead<br>petroleum<br>solvent - waste<br>total petroleum hydrocarbons (tph) | Groundwater<br>Soil | 2 | VCS |



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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Dant & Russell (DAR) - Mill Site<br>818 Hillcrest AVE<br>North Plains 97133 | 108 | arsenic<br>benzo(a)anthracene<br>benzo(a)pyrene<br>chromium<br>copper<br>pentachlorophenol<br>polyaromatic hydrocarbons (pah)<br>xylenes | Groundwater<br>Soil | 3 | SRS |
| DeWitt Construction<br>10910 NE Holman ST<br>Portland 97220 | 1350 | arsenic<br>chromium<br>dichloroethane,1,1-<br>dichloroethylene,1,2-cis-<br>diesel - fuel oil<br>lead<br>mercury<br>methylene chloride<br>tetrachloroethylene<br>trichloroethane,1,1,1-<br>trichloroethylene | Groundwater<br>Soil | 1 | SRS |
| Eastern OR Adolescent Multi-Treatment Center<br>412 SE Dorion AVE<br>Pendleton 97801 | 1899 | dieldrin | Soil | 2 | VCS |
| Elf Atochem North America<br>6400 NW Front AVE<br>Portland 97210 | 398 | ammonia<br>chlorobenzene<br>ddt,p,p'-<br>sodium bichromate<br>sodium chlorate | Groundwater<br>Soil<br>Surface Wate | 2 | VCS |
| Elstor Sales Corp. - Tax Lots 1101 & 1103<br>1100 Old Salem RD<br>Albany 97321 | 401 | arsenic<br>chromium<br>lead<br>pcbs | Soil | 1 | VCS |
| Erickson Air-Crane Co.<br>3100 Willow Springs RD<br>Central Point 97502 | 1231 | chlorobenzene<br>dichlorobenzene,1,2-<br>dichloroethane,1,1-<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-<br>tetrachloroethylene<br>trichloroethane,1,1,1-<br>trichloroethylene | Groundwater | 2 | SRS |

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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Eugene Stud & Veneer<br>3300 Cross ST<br>Eugene 97402 | 39 | chlorobenzene<br>pcb 1221<br>trichlorobenzene,1,2,3-<br>trichlorobenzene,1,2,4- | Groundwater<br>Soil | 1 | SAS |
| Eyerly Aircraft<br>2050 Turner RD SE<br>Salem 97302 | 305 | chromium<br>lead | Soil | 1 | SAS |
| Farmcraft Facility (Former)<br>8900 SW Commercial ST<br>Tigard 97223 | 1223 | aldrin<br>ddt,p,p'-<br>dieldrin<br>endosulfan<br>heptachlor<br>toxaphene | Soil | 2 | VCS |
| Fashion Cleaners<br>623 Klamath AVE<br>Klamath Falls 97601 | 1004 | dichloroethylene,1,2-cis-<br>tetrachloroethylene<br>trichloroethane,1,1,1-<br>trichloroethylene | Groundwater<br>Soil | 4 | SRS |
| Foothill BLVD Dump Site<br>Btwn 3074 & 3570 Foothill BLVD<br>Grants Pass 97526 | 578 | arsenic<br>barium<br>bis(2-ethylhexyl)phthalate<br>cadmium<br>chromium<br>copper<br>dieldrin<br>lead<br>mercury<br>oil or fuel related compounds<br>pcb 1221<br>selenium<br>silver<br>zinc | Groundwater<br>Soil | 1 | SRS |
| Forrest Paint Co.<br>1011 McKinley ST<br>Eugene 97402 | 201 | acetone<br>benzene<br>ethylbenzene<br>methyl ethyl ketone<br>methyl-2-pentanone,4-<br>toluene<br>xylenes | Groundwater<br>Soil | 4 | SRS |
| Frontier Leather Co. | 116 | chromium | Groundwater | 1 | SRS |



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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Frontier Leather Co. (cont.)<br>1210 NE Oregon ST<br>Sherwood 97140 | 116 | lead | Sediment<br>Soil | 1 | |
| Fuel Processors<br>4150 N Suttle Rd<br>Portland 97217 | 673 | arsenic<br>benzene<br>benzo(a)pyrene<br>benzo(b)fluoranthene<br>benzo(k)fluoranthene<br>chrysene<br>dibenzo(a,h)anthracene<br>dichloroethylene,1,1-<br>indeno(1,2,3-cd)pyrene<br>lead<br>methyl-2-pentanone,4-<br>methylene chloride<br>naphthalene | Groundwater<br>Soil | 2 | SRS |
| GASCO<br>7540 NW St. Helens RD<br>Portland 97210 | 84 | acenaphthene<br>anthracene<br>benzo(a)pyrene<br>ethylbenzene<br>fluoranthene<br>fluorene<br>lead<br>naphthalene<br>phenanthrene<br>phenol<br>pyrene | Groundwater<br>Soil | 2 | VCS |
| GE Apparatus Service Shop - Conger ST<br>537 Conger ST<br>Eugene 97402 | 1755 | pcbs<br>trichloroethylene | Groundwater | 1 | SAS |
| GNB Battery<br>576 Patterson ST NW<br>Salem 97304 | 358 | diesel - fuel oil<br>lead | Soil | 1 | VCS |
| Gould Inc./NL Industries Inc.<br>5909 NW 61st AVE<br>Portland 97210 | 49 | arsenic<br>cadmium<br>chromium<br>lead<br>sulfuric acid<br>zinc | Air<br>Groundwater<br>Sediment<br>Soil<br>Surface Wate | 3 | SRS |



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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Grant & Roth Plastics<br>1600 NE 25th AVE<br>Hillsboro 97124 | 1064 | dichloroethylene,1,2-cis-<br>tetrachloroethylene<br>trichloroethylene<br>vinyl chloride | Groundwater<br>Soil | 2 | VCS |
| Green Brothers Logging<br>6320 Hwy 35<br>Mount Hood 97041 | 1198 | benzene<br>diesel - fuel oil<br>ethylbenzene<br>gasoline<br>naphthalene<br>toluene<br>xylenes | Groundwater<br>Soil | 2 | SRS |
| Gresham (City of) Old Shop Site<br>219 S Main ST<br>Gresham 97030 | 1675 | benzene<br>benzo(a)anthracene<br>benzo(a)pyrene<br>benzo(b)fluoranthene<br>chlordane<br>chrysene<br>ddd,p,p'-<br>dde,p,p'-<br>ethylbenzene<br>heptachlor<br>indeno(1,2,3-cd)pyrene<br>lead<br>pcbs<br>toluene<br>total petroleum hydrocarbons (tph)<br>xylenes | Sludge<br>Soil | 2 | VCS |
| Groundwater - Mountain View DR<br>1050 E Mountain View DR<br>Newberg 97132 | 341 | trichloroethane,1,1,1- | Groundwater | 1 | SAS |
| Groundwater - NE 55th AVE & Columbia BLVD<br>5611 NE Columbia BLVD<br>Portland 97218 | 1015 | chloroform<br>dichloroethylene,1,2-cis-<br>tetrachloroethylene<br>trichloroethylene | Groundwater | 1 | SAS |
| Groundwater - SE 1st AVE & Stephens ST<br>Vicinity of SE 1st & Stephens ST<br>Portland 97214 | 1556 | tetrachloroethylene<br>trichloroethylene | Groundwater | 1 | SAS |
| Guilds Lake<br>2615-2619 NW Industrial ST | 404 | chromium<br>lead | Groundwater<br>Other | 3 | SRS |

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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Guilds Lake (cont.) | 404 | | | 3 | |
| Portland 97210 | | | | | |
| Gunderson Inc.<br>4350 NW Front AVE<br>Portland 97210 | 1155 | cadmium<br>chromium<br>copper<br>dichloroethylene,1,1-<br>lead<br>mercury<br>nickel<br>pcbs<br>solvent - waste<br>tetrachloroethylene<br>total petroleum hydrocarbons (tph)<br>trichloroethane,1,1,1-<br>zinc | Groundwater<br>Soil | 2 | VCS |
| Harbor Oil Inc.<br>11535 N Force ST<br>Portland 97217 | 24 | fluoranthene<br>lead<br>oil or fuel related compounds<br>pyrene<br>tetrachloroethylene<br>total petroleum hydrocarbons (tph)<br>trichloroethylene | Groundwater<br>Sediment<br>Soil<br>Surface Wate | 1 | VC |
| Helfrich Property<br>251 NE 133rd AVE<br>Portland 97230 | 122 | benzo(b)fluoranthene<br>chromium<br>chrysene<br>lead<br>mercury<br>pcb 1260<br>pentachlorophenol<br>zinc | Soil | 1 | SAS |
| Hillstrom's<br>912 N Front ST<br>Coos Bay 97420 | 1174 | arsenic<br>chromium<br>copper<br>lead<br>mercury<br>zinc | Other | 1 | VCS |
| Hoffman Construction Co.<br>8027 NE Killingsworth ST<br>Portland 97218 | 1522 | chloroform<br>methylene chloride<br>pcbs | Soil | 1 | SRS |

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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Hoffman Construction Co. (cont.) | 1522 | tetrachloroethylene<br>trichloroethane,1,1,1-<br>trichloroethylene | | 1 | |
| Hoyt ST Railyard<br>1105 NW 9th AVE<br>Portland 97209 | 1080 | benzene<br>copper<br>ethylbenzene<br>lead<br>pentachlorophenol<br>polyaromatic hydrocarbons (pah)<br>toluene<br>total petroleum hydrocarbons (tph)<br>trichloroethylene<br>xylenes<br>zinc | Groundwater<br>Soil<br>Surface Wate | 2 | SRS |
| ICN Pharmaceuticals - Parcels 234A & 235<br>6060 NE 112th AVE<br>Portland 97220 | 1219 | benzene<br>mercury<br>vinyl chloride | Groundwater<br>Soil | 2 | VCS |
| Illinois Tool Works Inc.<br>5209 SE International WAY<br>Milwaukie 97222 | 1016 | dichloroethane,1,1-<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>trichloroethylene<br>vinyl chloride | Groundwater<br>Soil | 4 | SRS |
| Imation<br>8124 Pacific AVE<br>White City 97503 | 1045 | acetone<br>methyl ethyl ketone<br>toluene | Groundwater | 2 | VCS |
| Immer & Oswald Volvo<br>?490 SE McLoughlin BLVD<br>adstone 97027 | 1436 | acetone<br>antimony<br>arsenic<br>benzene<br>butylbenzene,n-<br>butylbenzene,sec-<br>butylbenzene,tert-<br>chloroform<br>chromium<br>cumene<br>dichloroethane,1,1-<br>dichloroethane,1,2-<br>ethylbenzene<br>ethyltoluene,2-<br>ethyltoluene,4- | Groundwater<br>Other<br>Soil | 1 | SAS |



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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Immer & Oswald Volvo (cont.) | 1436 | gasoline<br>hexanone,2-<br>isopropyltoluene,p-<br>lead<br>methyl ethyl ketone<br>methyl-2-pentanone,4-<br>methylene chloride<br>naphthalene<br>oil - waste<br>propylbenzene,n-<br>styrene<br>tetrachloroethane,1,1,2,2-<br>tetrachloroethylene<br>toluene<br>total petroleum hydrocarbons (tph)<br>trichloroethane,1,1,1-<br>trichloroethylene<br>trimethylbenzene,1,2,4-<br>trimethylbenzene,1,3,5-<br>xylenes | | 1 | |
| Industrial Chrome Plating<br>6204 NE Hassalo ST<br>Portland 97213 | 1033 | chromium<br>copper<br>lead<br>plating wastes (chrome, acids)<br>zinc | Soil | 1 | SAS |
| Industrial Coatings<br>17370 SW 63rd AVE<br>Lake Oswego 97034 | 262 | acenaphthene<br>chromium<br>dichloroethylene,1,2-cis- | Groundwater<br>Soil<br>Surface Wate | 1 | VCS |
| Intel Corp. - Aloha Campus<br>3585 SW 198th AVE<br>Aloha 97007 | 1131 | dichloroethane,1,1-<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>tetrachloroethylene<br>trichloroethane,1,1,1-<br>trichloroethylene<br>vinyl chloride | Groundwater<br>Soil | 2 | VCS |
| JH Baxter & Co. - Eugene<br>85 Baxter ST<br>Eugene 97402 | 55 | acenaphthene<br>arsenic<br>cresols<br>fluoranthene<br>naphthalene<br>pentachlorophenol | Groundwater | 2 | SRS |

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SCOEPA00010504

SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| JH Baxter & Co. - Eugene (cont.) | 55 | phenanthrene<br>pyrene | | 2 | |
| JO Olsen Manufacturing Co.<br>11 & 41 N Danebo AVE<br>Eugene 97402 | 1254 | pentachlorophenol<br>petroleum hydrocarbons | Groundwater<br>Soil | 2 | VCS |
| James River Corp. - Wauna Mill<br>y 30<br>una 97016 | 649 | arsenic<br>benzo(a)pyrene<br>benzo(b)fluoranthene<br>benzo(k)fluoranthene<br>chromium<br>chrysene<br>dioxins<br>furan<br>pentachlorophenol | Soil | 1 | SAS |
| John Battin Power Service<br>8320 SE Otty RD<br>Portland 97266 | 1133 | dichloroethylene,1,2-cis-<br>pcbs<br>total petroleum hydrocarbons (tph)<br>trichloroethylene<br>vinyl chloride | Groundwater<br>Soil | 4 | VCS |
| Johnson Creek Landfill<br>7600 SE Johnson Creek BLVD<br>Milwaukie 97222 | 1232 | benzene<br>cadmium<br>carbon disulfide<br>chlorobenzene<br>chloroform<br>lead<br>phenols<br>polyaromatic hydrocarbons (pah)<br>toluene<br>trichloroethylene | Groundwater<br>Leachate | 1 | SAS |
| Joseph Forest Products (JFP)<br>83518 Russell LN<br>Joseph 97846 | 61 | arsenic<br>chromium<br>copper | Groundwater<br>Soil | 4 | SRS |
| Keno Area Groundwater Contamination<br>39S/8E/S31 & 40S/8E/S6<br>Keno 97627 | 2028 | benzene | Groundwater | 1 | SRS |
| Kimwood Corp.<br>77684 Hwy 99S<br>Cottage Grove 97424 | 1442 | chromic acid | Groundwater<br>Soil | 2 | VCS |



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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| LD McFarland<br>90049 Hwy 99N<br>Eugene 97402 | 63 | acenaphthene<br>anthracene<br>chlorophenol,2-<br>methylnaphthalene,2-<br>naphthalene<br>pentachlorophenol<br>phenanthrene<br>trichlorophenol,2,4,6- | Groundwater<br>Soil<br>Surface Wate | 3 | SRS |
| akeview Ranger Station<br>524 N "G" ST<br>Lakeview 97630 | 1387 | gasoline | Groundwater<br>Soil | 2 | VCS |
| Laurence-David Inc. (LDI)<br>1400 S Bertelsen RD<br>Eugene 97402 | 65 | acetone<br>benzene<br>dichloroethane,1,1-<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-trans-<br>ethyl acetate<br>ethylbenzene<br>lead<br>methyl ethyl ketone<br>methyl-2-pentanone,4-<br>methylene chloride<br>toluene<br>trichloroethane,1,1,1-<br>vinyl acetate<br>xylenes | Groundwater<br>Other<br>Soil | 2 | SRS |
| Linnton Oil Fire Training Grounds<br>North side of Hwy 30 on NW Marina WAY<br>Burlington 97231 | 1189 | acenaphthene<br>anthracene<br>arsenic<br>benzene<br>benzo(a)anthracene<br>benzo(a)pyrene<br>chrysene<br>dichloroethane,1,1-<br>dichloroethylene,1,1-<br>ethylbenzene<br>fluoranthene<br>fluorene<br>naphthalene<br>phenanthrene<br>pyrene<br>toluene | Groundwater | 2 | VCS |



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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Linnton Oil Fire Training Grounds (cont.) | 1189 | trichloroethane,1,1,1-<br>xylenes | | 2 | |
| Louisiana Pacific - Snow Mountain Pine<br>Hwy 20 S<br>Hines 97738 | 1998 | arsenic<br>benzene<br>benzo(a)anthracene<br>chromium<br>chrysene<br>copper<br>ethylbenzene<br>gasoline<br>lead<br>naphthalene<br>nickel<br>zinc | Groundwater<br>Sediment<br>Soil<br>Surface Wate | 2 | VCS |
| Loveness Lumber Mill (Former)<br>Loveness RD<br>Malin 97632 | 1157 | benzene<br>dichloroethane,1,2-<br>ethylbenzene<br>pentachlorophenol<br>polyaromatic hydrocarbons (pah)<br>toluene<br>xylenes | Groundwater<br>Soil | 2 | VCS |
| Martin Marietta Reduction Facility (MMRF)<br>3313 W 2nd ST<br>The Dalles 97058 | 72 | arsenic<br>cyanide (as ion)<br>fluoride (as ion)<br>polyaromatic hydrocarbons (pah) | Groundwater<br>Leachate<br>Other<br>Soil | 4 | SRS |
| McCormick & Baxter Creosoting Co.<br>6900 N Edgewater ST<br>Portland 97203 | 74 | arsenic<br>chromium<br>copper<br>pentachlorophenol<br>polyaromatic hydrocarbons (pah) | Groundwater<br>Sediment<br>Soil<br>Surface Wate | 3 | SRS |
| McGill Nursery<br>22315 NE Glisan ST<br>Gresham 97030 | 1764 | dieldrin<br>dinoseb<br>pcbs<br>total petroleum hydrocarbons (tph) | Soil | 1 | VCS |
| Mears Property<br>13725 SW Millikan WAY<br>Beaverton 97005 | 1592 | dichloroethane,1,1-<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>dichloroethylene,1,2-trans-<br>tetrachloroethylene | Groundwater<br>Soil | 1 | VCS |



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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Mears Property (cont.) | 1592 | trichloroethane,1,1,1-<br>trichloroethylene<br>vinyl chloride | | 1 | |
| Mercer Industries - Beaverton<br>10740 SW Denney RD<br>Beaverton 97005 | 136 | pentachlorophenol | Groundwater<br>Soil | 2 | VCS |
| Merlin Landfill<br>1749 Merlin RD<br>Grants Pass 97526 | 286 | benzene<br>carbon disulfide<br>dichlorobenzene,1,4-<br>dichloroethane,1,2-<br>dichloroethylene,1,2-cis-<br>dichloropropane,1,2-<br>methyl ethyl ketone<br>methylene chloride<br>nitrophenol,4-<br>tetrachloroethylene<br>toluene<br>trichloroethylene<br>vinyl chloride | Groundwater | 2 | SRS |
| Mid-State Properties Inc. - Albany Facility<br>200 S Pacific BLVD<br>Albany 97321 | 1207 | benzene<br>ethylbenzene<br>lead<br>toluene<br>xylenes | Groundwater<br>Soil | 2 | VCS |
| Milwaukie Area Groundwater Contamination<br>1S/2E/S31<br>Milwaukie 97222 | 706 | dichloroethylene,1,2-trans-<br>tetrachloroethylene<br>trichloroethylene | Groundwater | 2 | SRS |
| Mobil Oil Terminal<br>9420 NW St. Helens RD<br>Portland 97231 | 137 | diesel - fuel oil | Groundwater<br>Soil | 3 | VCS |
| Moore Mill & Lumber Co.<br>Riverside DR<br>Bandon 97411 | 80 | pentachlorophenol<br>tetrachlorophenol,2,3,4,6- | Soil | 1 | SAS |
| Morrison Oil Co.<br>3747 N Suttle RD<br>Portland 97217 | 800 | benzene<br>lead<br>pcbs<br>toluene<br>total petroleum hydrocarbons (tph) | Groundwater<br>Soil | 3 | SRS |



SCOEPA00010508

SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Morrison Oil Co. (cont.) | 800 | volatile organic compounds (voc)<br>xylenes | | 3 | |
| Murphy Plywood Co. - Milwaukie<br>3105 Harrison ST<br>Milwaukie 97222 | 280 | benzo(a)anthracene<br>benzo(a)pyrene<br>benzo(b)fluoranthene<br>benzo(k)fluoranthene<br>bis(2-ethylhexyl)phthalate<br>chrysene<br>dibenzo(a,h)anthracene<br>indeno(1,2,3-cd)pyrene<br>manganese<br>methylene chloride | Groundwater<br>Sediment<br>Soil | 1 | SAS |
| NW Cast/Universal Silver<br>9233 N Calvert AVE<br>Portland 97217 | 999 | antimony<br>arsenic<br>benzo(a)pyrene<br>benzo(b)fluoranthene<br>beryllium<br>cadmium<br>chlorinated hydrocarbons<br>chromium<br>chrysene<br>cobalt<br>copper<br>lead<br>mercury<br>nickel<br>pcb 1248<br>pcb 1254<br>pcbs<br>silver<br>total petroleum hydrocarbons (tph)<br>zinc | Soil | 1 | SRS |
| NW Pipe & Casing Co. Parcels A&B - Clackamas<br>9200 SE Lawnfield RD<br>Clackamas 97015 | 139 | pcb 1221<br>polyaromatic hydrocarbons (pah)<br>volatile organic compounds (voc) | Groundwater<br>Sediment<br>Soil<br>Surface Wate | 2 | SRS |
| North Marion County Disposal Facility<br>17827 NE Whitney LN<br>Woodburn 97071 | 1633 | arsenic<br>cadmium<br>lead<br>manganese<br>mercury | Groundwater | 2 | SRS |

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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| North Marion County Disposal Facility (cont.) | 1633 | methylene chloride<br>nickel<br>tetrachloroethylene<br>trichloroethylene | | 2 | |
| Nu-Way Oil Co.<br>7039 NE 46th AVE<br>Portland 97218 | 88 | chromium<br>lead<br>pcb 1242<br>pcb 1260<br>petroleum hydrocarbons<br>trichloroethylene | Groundwater<br>Other<br>Sediment<br>Soil | 2 | SRS |
| ODOT - Ambler RD East<br>SE 82nd AVE & SE Ambler RD<br>Milwaukie 0 | 1562 | arsenic<br>lead<br>polyaromatic hydrocarbons (pah)<br>total petroleum hydrocarbons (tph) | Soil | 3 | VCS |
| ODOT - Ambler RD West<br>SE Ambler RD & 82nd AVE<br>Clackamas 97015 | 1236 | dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>tetrachloroethylene<br>toluene<br>trichloroethane,1,1,1-<br>trichloroethylene<br>vinyl chloride<br>xylenes | Groundwater<br>Soil | 2 | SRS |
| ORE-IDA Foods<br>175 NE 6th AVE<br>Ontario 97914 | 1447 | benzene<br>ethylbenzene<br>toluene<br>xylenes | Groundwater<br>Soil | 2 | VCS |
| OREMET Titanium<br>530 W 34th AVE<br>Albany 97321 | 858 | acetone<br>aldrin<br>arsenic<br>beryllium<br>bhc,beta-<br>bis(2-ethylhexyl)phthalate<br>cadmium<br>chloroform<br>chromium<br>copper<br>cyanide (as ion)<br>di-n-butyl phthalate<br>di-n-octyl phthalate<br>dibenzofuran | Sediment<br>Soil<br>Surface Wate | 2 | VCS |



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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| OREMET Titanium (cont.) | 858 | dimethylphenol,2,4-<br>fluoranthene<br>hexachlorobenzene<br>lead<br>mercury<br>methylene chloride<br>naphthalene<br>nickel<br>nitrophenol,2-<br>pcbs<br>phenanthrene<br>phenol<br>pyrene<br>sulfuric acid<br>tetrachloroethylene<br>trichloroanisole,2,3,6-<br>trichloroethylene<br>vanadium<br>xylenes<br>zinc | | 2 | |
| Old Dominion Carstar<br>1060 W 1st AVE<br>Eugene 97402 | 1731 | polyaromatic hydrocarbons (pah) | Soil | 3 | VCS |
| Old Town Parking/Helistop Structure<br>33 NW Davis ST<br>Portland 97209 | 383 | acenaphthylene<br>benzene<br>ethylbenzene<br>naphthalene<br>toluene<br>xylenes | Groundwater | 2 | SRS |
| Oregon Air National Guard Base<br>6801 NE Cornfoot RD<br>Portland 97218 | 1372 | benzene<br>benzo(a)anthracene<br>benzo(a)pyrene<br>benzo(b)fluoranthene<br>benzo(ghi)perylene<br>benzo(k)fluoranthene<br>bromochloromethane<br>chrysene<br>dichloroethylene,1,2-<br>ethylbenzene<br>fluoranthene<br>methylene chloride<br>naphthalene | Groundwater | 1 | SRS |



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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Oregon Air National Guard Base (cont.) | 1372 | phenanthrene<br>toluene<br>trichloroethylene<br>xylenes | | 1 | |
| Oregon Fir Supply Co.<br>11100 NE Holman ST<br>Portland 97220 | 1220 | arsenic<br>chromium, hexavalent<br>dichloroethane,1,1-<br>dichloroethylene,1,2-<br>pentachlorophenol<br>tetrachloroethylene<br>trichloroethylene<br>vinyl chloride | Groundwater<br>Soil | 2 | SRS |
| Oregon State Penitentiary<br>2605 State ST<br>Salem 97310 | 621 | dichloroethylenes<br>tetrachloroethylene<br>toluene<br>trichloroethylene<br>vinyl chloride | Groundwater<br>Soil | 2 | VCS |
| Osmose Wood Preserving<br>32092 Hwy 34<br>Tangent 97389 | 1369 | chromium | Groundwater | 2 | VCS |
| PC Development Inc.<br>955 N Columbia BLVD<br>Portland 97217 | 143 | trichloroethylene | Groundwater<br>Soil | 1 | SAS |
| PGE - Station L<br>1841 SE Water AVE<br>Portland 97214 | 151 | pcb 1260 | Sediment<br>Soil | 4 | SRS |
| Pacific Car Crushing<br>12122 N Columbia BLVD<br>Portland 97203 | 2057 | oil - waste | | 1 | SAS |
| Pacific Meat Co.<br>2701 N Newark ST<br>Portland 97217 | 145 | arsenic<br>lead<br>mercury<br>pcb 1260 | Sediment<br>Soil | 1 | SRS |
| Pacific Power & Light - Astoria Service Center<br>1224 Marine DR<br>Astoria 97103 | 147 | benzene<br>benzo(a)anthracene<br>benzo(a)pyrene<br>benzo(b)fluoranthene | Groundwater<br>Soil | 1 | SAS |



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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Pacific Power & Light - Astoria Service Center (cont.) | 147 | benzo(k)fluoranthene<br>chrysene<br>dibenzo(a,h)anthracene<br>indeno(1,2,3-cd)pyrene | | 1 | |
| Palmer Bros. - Snow Mountain Pine<br>Snow Mountain Pine LN<br>Hines 97738 | 2001 | pentachlorophenol | Groundwater<br>Soil | 2 | VCS |
| Parrett Mountain Sludge Lagoons<br>T3S/R2W/Section 23<br>Newberg 97132 | 309 | chlorobenzene<br>pcb 1221<br>tetrachloroethane,1,1,1,2-<br>toluene<br>trichloroethylene<br>xylenes | Other<br>Soil | 1 | VCS |
| Pearl ST Property<br>408 Pearl ST<br>Eugene 97401 | 1191 | benzene<br>dichloroethylenes<br>diesel - fuel oil<br>lead<br>methylene chloride<br>petroleum<br>tetrachloroethylene<br>trichloroethylene<br>vinyl chloride | Groundwater<br>Soil | 2 | VCS |
| Pendleton Grain Growers - Stanfield<br>Feedville & Hinkle roads<br>Hermiston 97838 | 639 | chlordane | Soil | 4 | SRS |
| Permapost Products Co.<br>25600 SW Tualatin Valley Hwy<br>Hillsboro 97123 | 148 | arsenic<br>pentachlorophenol<br>tetrachlorophenol,2,3,4,6- | Groundwater<br>Soil | 1 | SAS |
| Pittsburg Testing Laboratory - Eugene<br>545 Conger ST<br>Eugene 97402 | 1727 | dichloroethylene,1,1-<br>pcbs<br>tetrachloroethylene<br>trichloroethane,1,1,1-<br>trichloroethylene<br>vinyl chloride | Groundwater | 1 | SAS |
| Portable Equipment Salvage Co. (PESC)<br>10281 SE Mather RD<br>Clackamas 97015 | 149 | copper<br>dichlorobenzenes<br>lead<br>mercury | Groundwater<br>Soil | 4 | SRS |



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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Portable Equipment Salvage Co. (PESC) (cont.) | 149 | pcb 1260<br>trichloroethane,1,1,1-<br>trichloroethylene<br>zinc | | 4 | |
| Precision Equipment Inc.<br>8440 N Kerby ST<br>Portland 97217 | 152 | chromium | Soil | 1 | VCS |
| Pride of Oregon Texaco Station<br>460 N Main ST<br>Tillamook 97141 | 1915 | benzene<br>diesel - fuel oil<br>ethylbenzene<br>gasoline<br>methyl-tert-butyl ether<br>oil - lubricating<br>toluene<br>total petroleum hydrocarbons (tph)<br>xylenes | Groundwater<br>Soil | 1 | SRS |
| RFD Publishing Inc.<br>6960 SW Sandburg RD<br>Tigard 97223 | 1249 | chloroform<br>dichloroethane,1,1-<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>dichloroethylene,1,2-trans-<br>dichloropropene,1,3-trans-<br>tetrachloroethylene<br>trichloroethane,1,1,1-<br>trichloroethane,1,1,2-<br>trichloroethylene | Groundwater | 2 | VCS |
| RMAC International Inc.<br>3601 NW Marine DR<br>Troutdale 97060 | 1918 | arsenic<br>barium<br>benzene<br>bis(2-ethylhexyl)phthalate<br>cadmium<br>chromium<br>chrysene<br>cresols<br>iron<br>lead<br>polyaromatic hydrocarbons (pah) | Leachate<br>Other<br>Sediment<br>Sludge<br>Soil<br>Surface Wate | 1 | SRS |
| RS Davis Recycling Inc.<br>10105 SE Mather RD<br>Clackamas 97015 | 1927 | cadmium<br>chromium<br>lead | Sediment<br>Soil | 1 | SRS |

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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| RS Davis Recycling Inc. (cont.) | 1927 | mercury<br>pcbs<br>selenium<br>total petroleum hydrocarbons (tph) | | 1 | |
| Reynolds Metal Co.<br>5100 NE Sundial RD<br>Troutdale 97060 | 154 | arsenic<br>beryllium<br>cyanide (as ion)<br>fluoride (as ion)<br>polyaromatic hydrocarbons (pah) | Groundwater<br>Sediment<br>Soil | 2 | SRS |
| Rhone-Poulenc - N Marine DR<br>4429 N Suttle RD<br>Portland 97217 | 165 | arsenic<br>benzene<br>bhc,alpha-<br>ddt,p,p'-<br>dieldrin | Groundwater<br>Sediment<br>Soil | 2 | SRS |
| Rhone-Poulenc Inc. - NW St. Helens RD<br>6200 NW St. Helens RD<br>Portland 97210 | 155 | benzene<br>d,2,4-<br>db,2,4-<br>dichlorobenzene,1,2-<br>dichlorophenol,2,4-<br>dichlorophenol,2,6-<br>dichloroprop<br>ethylbenzene<br>mcpa<br>methylene chloride<br>phenols<br>t,2,4,5-<br>tetrachlorodibenzo-p-dioxin,2,3,7,8-<br>toluene<br>trichloroethylene<br>trichlorophenol,2,4,6-<br>xylenes | Groundwater<br>Soil | 2 | SRS |
| Riverfront Research Park<br><br>Eugene 97403 | 1018 | polyaromatic hydrocarbons (pah) | Soil | 2 | VCS |
| SP Anodizing<br>7415 SE Johnson Creek BLVD<br>Portland 97206 | 279 | arsenic<br>cadmium<br>chromium<br>cobalt<br>copper<br>lead | Sediment<br>Soil | 1 | VCS |



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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| SP Anodizing (cont.) | 279 | magnesium<br>mercury<br>nickel<br>pcb 1260<br>toluene<br>xylenes<br>zinc | | 1 | |
| Safety-Kleen - Clackamas<br>11843 SE Hwy 212<br>Clackamas 97015 | 1315 | dichloroethane,1,1-<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>tetrachloroethylene<br>toluene<br>total petroleum hydrocarbons (tph)<br>trichloroethanes<br>trichloroethylene<br>xylenes | Groundwater | 1 | RCRA |
| Safeway Store #308<br>70 E Oak ST<br>Lebanon 97355 | 1694 | tetrachloroethylene<br>trichloroethylene<br>volatile organic compounds (voc) | Groundwater | 2 | VCS |
| Schnitzer - Moody AVE Units A, B & C<br>Moody AVE (South Waterfront)<br>Portland 97201 | 875 | dde,p,p'-<br>ddt,p,p'-<br>lead<br>mercury<br>pcbs<br>polyaromatic hydrocarbons (pah)<br>zinc | Soil | 3 | SRS |
| Schoen Electric<br>626 Queen AVE SW<br>Albany 97321 | 1195 | dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>dichloroethylene,1,2-trans-<br>trichloroethylene<br>vinyl chloride | Groundwater | 1 | VCS |
| Selmet Inc.<br>33992 Seven Mile LN<br>Albany 97321 | 342 | dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>tetrachloroethylene<br>trichloroethylene<br>trichloromonofluoromethane<br>vinyl chloride | Groundwater<br>Soil | 2 | VCS |
| Shopping Center Property - Nature's Fresh NW<br>3535 NE 15th AVE | 1855 | tetrachloroethylene | Groundwater<br>Soil | 1 | VCS |



SCOEPA0001051G

SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Shopping Center Property - Nature's Fresh NW (cont.)<br>Portland 0 | 1855 | | | 1 | |
| Simplot Soil Builders<br>213 Oregon ST E<br>Vale 97918 | 1216 | benzene<br>dichloropropane,1,2-<br>petroleum hydrocarbons | Groundwater<br>Soil | 2 | VCS |
| South Waterfront Redevelopment<br>SW River Drive<br>Portland 97201 | 602 | lead<br>oil or fuel related compounds | Groundwater<br>Soil | 2 | VCS |
| Southern Pacific RR Right-Of-Way - Tigard<br>SPPR Right-Of-Way west of 8900 SW Commercial ST<br>Tigard 97223 | 1597 | aldrin<br>ddt,p,p'-<br>dieldrin | Soil | 2 | VCS |
| Southern Pacific Transportation Co. - E Milwaukie<br>SW of SE Harmony RD & SE 82nd AVE<br>Milwaukie 97222 | 1190 | dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>tetrachloroethylene<br>trichloroethylene<br>vinyl chloride | Groundwater<br>Soil<br>Surface Wate | 3 | SRS |
| Southern Pacific Transportation Co. - Eugene Yards<br>341 Bethel DR<br>Eugene 97402 | 312 | oil - lubricating | Soil | 2 | VCS |
| Springfield Airport (Abandoned)<br>SW corner of 28th ST & Olympic ST<br>Springfield 97478 | 239 | ddd,p,p'-<br>dde,p,p'-<br>ddt,p,p'-<br>dieldrin<br>endosulfan i<br>endosulfan sulfate<br>endrin<br>heptachlor<br>heptachlor epoxide<br>methoxychlor | Soil | 2 | SRS |
| St. John's Landfill<br>9363 N Columbia BLVD<br>Portland 97203 | 164 | acetone<br>arsenic<br>barium<br>benzene<br>bhc,gamma-<br>carbon disulfide<br>carbon tetrachloride | Groundwater<br>Other | 2 | SW |



SCOEPA00010517

SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| St. John's Landfill (cont.) | 164 | chlorobenzene<br>chloroethane<br>chromium<br>dichlorobenzene,1,4-<br>dichloroethane,1,1-<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>ethylbenzene<br>lead<br>mercury<br>methylene chloride<br>tetrachloroethylene<br>toluene<br>trichloroethane,1,1,1-<br>trichloroethylene<br>vinyl chloride<br>xylenes | | 2 | |
| Stanley Proto Tool (SPT)<br>10330 SE 32nd AVE<br>Milwaukie 97222 | 1171 | chromium<br>dichloroethylene,1,2-cis-<br>nickel<br>tetrachloroethylene<br>total petroleum hydrocarbons (tph)<br>trichloroethylene | Groundwater<br>Soil | 2 | VCS |
| Surgichrome Inc.<br>16569 SE 115th AVE<br>Clackamas 97015 | 1526 | chromium | Groundwater<br>Sediment<br>Soil<br>Surface Wate | 2 | SRS |
| Swift Adhesives<br>18408 NE San Rafael ST<br>Portland 97230 | 884 | carbon disulfide<br>dichloroethane,1,1-<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>methylene chloride<br>tetrachloroethane,1,1,1,2-<br>trichloroethane,1,1,1-<br>trichloroethylene | Groundwater | 3 | SRS |
| TRUAX Bulk Petroleum Storage Facility<br>1414 Salem AVE<br>Albany 97321 | 1961 | benzene<br>diesel - fuel oil<br>gasoline | Groundwater<br>Soil | 1 | SAS |
| Tacoma ST Overpass<br>8217 SE McLoughlin BLVD | 1159 | benzene<br>chlorobenzene | Groundwater | 2 | VCS |

(inv_list.rpt)

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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Tacoma ST Overpass (cont.)<br>Portland 97202 | 1159 | dichlorobenzene,1,4-<br>dichloroethane,1,2-<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-trans-<br>ethylbenzene<br>tetrachloroethylene<br>toluene<br>trichloroethane,1,1,1-<br>trichloroethane,1,1,2-<br>trichloroethylene<br>vinyl chloride<br>xylene,o-<br>xylenes | | 2 | |
| Tektronix Inc. - Beaverton Campus<br>13700 SW Karl Braun DR<br>Beaverton 97077 | 167 | chromium<br>copper<br>dichloroethylene,1,2-trans-<br>lead<br>nickel<br>tetrachloroethylene<br>trichloroethylene<br>zinc | Groundwater<br>Sediment | 1 | SAS |
| Tektronix Inc. - Building 93<br>13645 NW Science Park RD<br>Aloha 97006 | 1194 | dichloroethylene,1,2-cis-<br>dichloroethylene,1,2-trans-<br>trichloroethylene<br>vinyl chloride | Groundwater<br>Soil | 1 | SAS |
| Teledyne Wah Chang Albany<br>1600 NE Old Salem RD<br>Millersburg 97321 | 315 | barium<br>chromium<br>dichloroethane,1,1-<br>dichloroethylene,1,1-<br>hexachlorobenzene<br>lead<br>methyl-2-pentanone,4-<br>nickel<br>radium<br>trichloroethane,1,1,1-<br>trichloroethylene<br>vinyl chloride | Groundwater<br>Sediment<br>Soil | 2 | SRS |
| Texaco Portland Terminal<br>3800 NW St. Helens RD<br>Portland 97210 | 169 | acenaphthene<br>acenaphthylene<br>anthracene<br>arsenic | Groundwater<br>Soil | 2 | VCS |



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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Texaco Portland Terminal (cont.) | 169 | benzene<br>benzo(a)anthracene<br>benzo(a)pyrene<br>benzo(b)fluoranthene<br>benzo(ghi)perylene<br>benzo(k)fluoranthene<br>chrysene<br>dibenzo(a,h)anthracene<br>ethylbenzene<br>fluoranthene<br>fluorene<br>indeno(1,2,3-cd)pyrene<br>lead<br>naphthalene<br>phenanthrene<br>pyrene<br>toluene<br>total petroleum hydrocarbons (tph)<br>xylenes | | 2 | |
| Tongue Point Landfill<br>Tongue Point<br>Astoria 97103 | 171 | arsenic<br>bis(2-ethylhexyl)phthalate<br>cadmium<br>chromium<br>copper<br>lead<br>mercury<br>pcb 1254<br>total petroleum hydrocarbons (tph) | Groundwater<br>Sediment<br>Soil<br>Surface Wate | 2 | VCS |
| Toyota Motor Sales<br>10400 N Lombard ST<br>Portland 97203 | 172 | petroleum<br>volatile organic compounds (voc) | Soil | 1 | SAS |
| Trumbull Asphalt Plant<br>3605 NW 35th AVE<br>Portland 97210 | 1160 | total petroleum hydrocarbons (tph) | Groundwater<br>Soil | 1 | SAS |
| Trus Joist MacMillan - Junction City<br>93747 Hwy 99S<br>Junction City 97448 | 1714 | toluene | Groundwater<br>Soil | 1 | VCS |
| Tualatin River Pipeline Leak<br>2S/1W/S16c<br>0 | 1682 | benzene<br>ethylbenzene<br>gasoline | Groundwater<br>Soil | 2 | VCS |



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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Tualatin River Pipeline Leak (cont.) | 1682 | petroleum hydrocarbons<br>toluene<br>xylenes | | 2 | |
| US Army COE - Portland Moorings<br>8010 NW St. Helens RD<br>Portland 97210 | 1641 | acenaphthene<br>anthracene<br>arsenic<br>benzo(a)anthracene<br>benzo(a)pyrene<br>benzo(b)fluoranthene<br>benzo(ghi)perylene<br>chromium<br>chrysene<br>copper<br>ddd,p,p'-<br>ddt,p,p'-<br>dibenzo(a,h)anthracene<br>dibenzofuran<br>dieldrin<br>fluoranthene<br>fluorene<br>indeno(1,2,3-cd)pyrene<br>lead<br>naphthalene<br>pcbs<br>petroleum hydrocarbons<br>phenanthrene<br>pyrene<br>tributyltin<br>zinc | Sediment<br>Soil | 1 | VC |
| Umatilla Army Depot Activity<br>I-84 & Exit 178<br>Hermiston 97838 | 514 | cyclotrimethylenetrinitramine<br>dinitrotoluene,2,6-<br>lead<br>trinitrotoluene,2,4,6- | Groundwater<br>Soil | 3 | SRS |
| Union Oil Service Station - Tillamook<br>540 N Main<br>Tillamook 97141 | 1916 | gasoline | | 1 | SAS |
| Union Pacific RR - Crescent Lake<br>Wye Track<br>Crescent Lake 97425 | 1466 | bunker - fuel oil | Groundwater<br>Soil | 2 | VCS |
| Union Pacific RR - K. Falls | 297 | benzene | Groundwater | 2 | VCS |



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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Union Pacific RR - K. Falls (cont.)<br>1585 Oak ST<br>Klamath Falls 97601 | 297 | diesel - fuel oil<br>tetrachloroethylene | Soil | 2 | |
| Union Pacific RR - La Grande<br>Jefferson ST & Fir ST<br>La Grande 97850 | 631 | acenaphthene<br>benzene<br>fluorene<br>petroleum<br>phenanthrene<br>total petroleum hydrocarbons (tph) | Groundwater<br>Soil | 3 | SRS |
| Union Pacific RR - The Dalles<br>Tie Plant RD<br>The Dalles 97058 | 54 | arsenic<br>benzene<br>benzo(a)anthracene<br>benzo(k)fluoranthene<br>chrysene<br>naphthalene<br>pentachlorophenol<br>polyaromatic hydrocarbons (pah)<br>toluene<br>xylenes | Groundwater<br>Sediment<br>Soil | 3 | SRS |
| Union Pacific Railroad - Ashland<br>North of "A" ST, from Pioneer east to 8th<br>Ashland 97520 | 1146 | arsenic<br>lead<br>oil or fuel related compounds<br>xylenes | Groundwater<br>Soil | 2 | VCS |
| Union Station - Parcel B South<br>Between Union Station & Naito Parkway<br>Portland 0 | 1885 | arsenic<br>lead<br>polyaromatic hydrocarbons (pah)<br>total petroleum hydrocarbons (tph) | Groundwater<br>Soil | 3 | VCS |
| United Chrome Products Inc. (UCP)<br>2000 Airport RD<br>Corvallis 97333 | 317 | chromium, hexavalent | Groundwater<br>Sediment<br>Soil<br>Surface Wate | 4 | SRS |
| Unocal Bulk Plant #0333<br>1459 S 6th ST<br>Klamath Falls 97601 | 1221 | benzene<br>ethylbenzene<br>petroleum hydrocarbons<br>total hydrocarbons (as diesel)<br>total petroleum hydrocarbons (tph) | Groundwater<br>Soil | 2 | VCS |
| Unocal Service Station #3838<br>11 Coburg RD | 1612 | tetrachloroethylene | Groundwater | 1 | SAS |



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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Unocal Service Station #3838 (cont.) | 1612 | | | 1 | |
| Eugene 97401 | | | | | |
| Unocal Terminal 0022 (Former)<br>256 Marine DR<br>Astoria 97103 | 1646 | acenaphthylene<br>ammonia<br>anthracene<br>benzene<br>benzo(a)anthracene<br>benzo(a)pyrene<br>benzo(b)fluoranthene<br>benzo(ghi)perylene<br>benzo(k)fluoranthene<br>chrysene<br>cyanide (as ion)<br>dibenzo(a,h)anthracene<br>dibenzofuran<br>diesel - fuel oil<br>ethylbenzene<br>fluoranthene<br>fluorene<br>gasoline<br>indeno(1,2,3-cd)pyrene<br>naphthalene<br>oil or fuel related compounds<br>phenanthrene<br>pyrene<br>toluene<br>xylenes | Groundwater<br>Soil | 2 | VCS |
| Vadis Pole Yard<br>Vadis RD<br>North Plains 97133 | 109 | arsenic<br>benzo(a)anthracene<br>benzo(a)pyrene<br>chromium<br>chrysene<br>fluorene<br>naphthalene<br>pentachlorophenol<br>phenanthrene<br>pyrene | Groundwater<br>Soil | 2 | VCS |
| Van Waters & Rogers<br>3950 NW Yeon AVE<br>Portland 97210 | 330 | benzene<br>chloroform<br>dichloroethane,1,2-<br>dichloroethylene,1,1- | Groundwater | 1 | SAS |



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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Van Waters & Rogers (cont.) | 330 | dichloroethylene,1,2-cis-<br>dichloroethylene,1,2-trans-<br>ethylbenzene<br>methylene chloride<br>styrene<br>tetrachloroethylene<br>toluene<br>trichloroethane,1,1,1-<br>trichloroethane,1,1,2-<br>trichloroethylene<br>vinyl chloride<br>xylenes | | 1 | |
| VanOsten Properties - TL 701<br>21372 E Hwy 20*<br>Bend 97701 | 365 | pentachlorophenol | Sludge<br>Soil | 2 | VCS |
| Viking Industries Inc.<br>18600 NE Wilkes RD<br>Portland 97230 | 885 | diesel - fuel oil | Groundwater<br>Soil | 2 | LUST |
| Wacker Siltronic Corp.<br>7200 NW Front AVE<br>Portland 97210 | 183 | benzene<br>benzo(a)anthracene<br>benzo(a)pyrene<br>benzo(b)fluoranthene<br>benzo(k)fluoranthene<br>chlorophenol<br>chrysene<br>dimethylphenol,2,4-<br>ethylbenzene<br>indeno(1,2,3-cd)pyrene<br>petroleum hydrocarbons<br>tetrachloroethylene<br>toluene<br>toluenediamine,2,4- | Groundwater<br>Soil | 1 | SAS |
| Warn Industries<br>13270 SE Pheasant CT<br>Milwaukie 97222 | 1118 | dichloroethane,1,2-<br>dichloroethanes<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>tetrachloroethylene<br>total hydrocarbons (as diesel)<br>total petroleum hydrocarbons (tph)<br>trichloroethane,1,1,1-<br>trichloroethane,1,1,2- | Groundwater<br>Soil | 2 | SRS |



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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Warn Industries (cont.) | 1118 | trichloroethylene | | 2 | |
| Western Foundry Co.<br>8200 SW Hunziker RD<br>Tigard 97223 | 185 | cadmium<br>chromium<br>lead<br>oil or fuel related compounds<br>pcbs | Sediment<br>Soil | 2 | VCS |
| Weyerhaeuser - Sycan Shop<br>36S/12E/S12<br>Beatty 97621 | 650 | dichloroethane,1,1-<br>diesel - fuel oil<br>ethylbenzene<br>gasoline<br>oil or fuel related compounds<br>tetrachloroethylene<br>toluene<br>trichloroethane,1,1,1-<br>trichloroethylene<br>xylenes | Groundwater<br>Soil | 2 | VCS |
| White King & Lucky Lass Uranium Mines<br>37S/19E/s30<br>Lakeview 97630 | 601 | arsenic<br>cadmium<br>manganese<br>molybdenum<br>uranium<br>zinc | Surface Wate | 2 | SRS |
| Willamette Oaks Building<br>6720 SW Macadam AVE<br>Portland 97219 | 883 | chlorinated solvents<br>dichloroethylene,1,1-<br>dichloroethylene,1,2-cis-<br>dichloroethylene,1,2-trans-<br>tetrachloroethylene<br>trichloroethylene<br>vinyl chloride | Groundwater | 2 | SRS |
| XDP Inc.<br>4288 SE International WAY<br>Milwaukie 97222 | 1117 | dichloroethylene,1,2-cis-<br>tetrachloroethylene<br>trichloroethylene<br>vinyl chloride | Groundwater | 1 | SRS |
| Zidell Waterfront Property<br>Straddles the Ross Island Bridge on the west side<br>Portland 97201River | 689 | antimony<br>arsenic<br>benzene<br>chromium<br>lead<br>nickel | Groundwater<br>Sediment<br>Soil | 2 | VCS |



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SUMMARY OF
FACILITIES ON DEQ INVENTORY#
OF HAZARDOUS SUBSTANCE SITES

| SITE NAME / LOCATION | SITE ID | SUBSTANCES | MEDIA CONTAMINATED | PHASE | CURRENT PROGRAM |
|---|---|---|---|---|---|
| Zidell Waterfront Property (cont.) | 689 | oil or fuel related compounds<br>pcbs<br>polyaromatic hydrocarbons (pah)<br>tributyltin | | 2 | |

TOTAL SITES : 196



SCOEPA00010526

Oregon
John A. Kitzhaber, M.D., Governor

Department of Environmental Quality
811 SW Sixth Avenue
Portland, OR 97204-1390
(503) 229-5696
TDD (503) 229-6993

October 19, 1999

Thomas C. McCue
Environmental Manager
Wacker Siltronic Corporation
P.O. Box 83180 M/S 30
Portland, Oregon 97283-0180

**CERTIFIED MAIL**

Re: Wacker Siltronic Site: Request for Performance of Remedial Investigation and Feasibility Study

Dear Mr. McCue:

This letter informs you of the results of our review of information regarding hazardous substance contamination at the Wacker Siltronic (Wacker) facility located at 7200 N.W. Front Avenue in Portland, Oregon. The Oregon Department of Environmental Quality has determined that the Wacker site is a high priority for a remedial investigation and feasibility study and requests that Wacker Siltronic Corporation perform a remedial investigation and feasibility study in accordance with the Environmental Cleanup Law, Oregon Revised Statutes (ORS) 465.200 *et seq.*

The Wacker facility is located within or near a portion of the Willamette River known as the Portland Harbor. A 1997 investigation revealed significant contamination of sediments within the harbor. DEQ has undertaken review of available information regarding properties throughout the harbor to identify potential sources of the sediment contamination. The results of DEQ's review, based on available site data, historical operations, (including the use of hazardous substances), and the presence of contaminants in adjacent sediments, for the Wacker facility are summarized in the enclosed Strategy Recommendation.

Available information indicates that a release of a hazardous substance has occurred or might have occurred at the Wacker facility and come to be located in Willamette River sediments. DEQ has determined that remedial action might be necessary to protect public health, safety, welfare and the environment and that a remedial investigation and feasibility study must be performed. The remedial investigation will fully identify, among other things, the source, nature, and extent of any releases of hazardous substances to sediments at or near the Wacker facility, and determine whether further remedial measures will be necessary at the Wacker facility. The feasibility study will be designed to select an appropriate remedy for the site.

DEQ proposes that your performance of the remedial investigation and feasibility study be governed by an agreement in the form of the enclosed Voluntary Agreement for a Remedial Investigation and Feasibility Study and Scope of Work. The facility's remedial investigation and



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feasibility study will be coordinated with harbor-wide sediments investigations currently being pursued by DEQ. This will require commencement of the remedial investigation and feasibility study at the Wacker facility in the near future.

**DEQ requests that you review the enclosed Strategy Recommendation and standard Voluntary Agreement and Scope of Work, and inform DEQ whether you are willing to perform a remedial investigation and feasibility study by signing and returning the enclosed Intent to Participate form within 30 calendar days of mailing of this letter. Upon receipt of the Intent to Participate, DEQ will forward you a Voluntary Agreement and Scope of Work specific to the Wacker facility, and request that any questions regarding the agreement be resolved so that the agreement may be entered no later than 60 calendar days from the mailing of this letter.**

Please note that, by signature and return of the Intent to Participate form, you would indicate a willingness to enter a Voluntary Agreement under the terms of the enclosed standard Voluntary Agreement. The second Voluntary Agreement that DEQ will forward you after receipt of the Intent to Participate will include the Wacker facility's name and other information specific to the facility. However, DEQ does not intend to substantially negotiate or revise the terms of the standard Agreement. The 60 days provided for entry of the Voluntary Agreement therefore should be sufficient.

Should you not indicate a willingness to perform the remedial investigation and feasibility study by return of the Intent to Participate form, or should you subsequently refuse to enter a Voluntary Agreement for the remedial investigation and feasibility study, DEQ will assume you are not willing to perform the remedial investigation and feasibility study. In this case, as with other facilities in the Portland Harbor, DEQ will exercise all remedies available to it under the Environmental Cleanup Law to ensure that necessary investigations are undertaken. These remedies include but are not limited to issuance of a unilateral administrative order requiring performance of the remedial investigation and feasibility study, and performance of the investigation by DEQ itself with subsequent cost recovery from liable parties.

Finally, please be advised that DEQ is required by ORS 465.330 to recover remedial action costs incurred by DEQ, including for site assessment activities. You will be receiving an invoice in the near future for DEQ's costs of preparing the Strategy Recommendation for the Wacker facility. Reimbursement of future DEQ costs will be provided through the voluntary agreement for the facility, if one is entered.

You may reach me at (503) 229-5648 if you have any questions related to the enclosed Strategy Recommendation.

Sincerely,

Eric Blischke, Coordinator
Portland Harbor Study Area
Waste Management and Cleanup Division

Enclosures

c: Kurt Burkholder, DOJ
Dave St. Louis, Manager, NWR Site Assessment Program
Mike Rosen, NWR Voluntary Cleanup Program
Gil Wistar, Coordinator, Site Assessment Program
ESCI File No.: 183

# VOLUNTARY CLEANUP PROGRAM
# INTENT TO PARTICIPATE

## Identification of Site

Site Name: Wacker Siltronic Site

Site Address: 7200 NW Front Avenue, Portland, OR

Owner/Operator: Wacker Siltronic Corporation

Mailing Address: Attn: Thomas C. McCue, Wacker Siltronic Corporation
P.O. Box 83180, M/S 30, Portland, OR 97283-0180

## Intent to Participate

The undersigned intends to negotiate in good faith a written agreement with DEQ to provide for voluntary performance of a remedial investigation under DEQ oversight. The agreement will describe the project activities of each party and will require the undersigned to reimburse DEQ for oversight costs.

With this Intent to Participate, the undersigned does not admit or assume liability regarding the site.

Please execute this Intent to Participate in the space below and return it to:

Eric Blischke
Department of Environmental Quality
Waste Management and Cleanup Division
811 S.W. Sixth Avenue
Portland, OR 97204

**By:** _____ **Name:** _____
(signature of authorized representative) (print or type)

**Title:** _____ **Company:** _____

**Date:** _____ **Telephone:** _____

OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY
SITE ASSESSMENT ACTION – [ ] REGION

Facility Name: WACKER SILTRONIC CORP. ECSI #: 193

Address: 7200 N.W. FRONT AVE
PORTLAND, OR 97210

PRP

Company: WACKER SILTRONIC CORP.

Name THOMAS McCUE Phone: 503 241 7532

Address 7200 N.W. FRONT AVE.
PORTLAND, OR 97210 Action Date: 10/8/99

Report Type:

Preliminary Assessment:

___ State ___ Federal ___ Voluntary ___ PAE ___ XPA

Screening:

X State ___ Federal ___ Spill TAS Project ID and No. (for St. Screenings)_____

Note: Spill screenings may not require Strategy Recommendation

Recommended Action:

___ NFA [Need management approval]

___ Add to CRL

___ Add to Inventory

X High Priority–Requires immediate response - RI/FS

___ Recommend Preliminary Assessment _____ Priority

___ Initiate Invoicing (for State Screenings)

___ Other (Describe):

Report Writer: ERIC BLISCHKE

Headquarters EPA Other

Transmittal Date(s):

Report Supplement(s):

Sample
Analysis Photos Plans

Supplement Date(s):

---

Checklist:

X Strategy Recommendation ___ Letter to RP X SAPS X Map

X Data (if applicable) ___ Spill Report (if applicable) ___ SSR Manager's approval: _____

# SITE ASSESSMENT PRIORITIZATION SYSTEM (SAPS) - SCORESHEET

Site Name: WACKER SILTRONIC CORPORATION

Site Address: 7200 N.W. FRONT AVENUE

ECSI Number: 183

EPA ID Number: 0962537737

Site Evaluator: ERIC BLISCHKE

Date: 9/30/99

| | | HIGH THREAT | MEDIUM THREAT | LOW THREAT | NO THREAT | CONF. VALUE |
|---|---|---|---|---|---|---|
| 1. | Potential to Release (Route Characteristics) | | | | | |
| | a. Haz. Sub. Containment | 9 | (6) | 3 | 0 | B |
| | b. Depth To Aquifer | (6) | 4 | 2 | 0 | A |
| | c. Distance to DW Well | 6 | 4 | (2) | 0 | A |
| | d. Soil Permeability | 3 | (2) | 1 | 0 | A |
| | e. Distance to Surface Water | (6) | 4 | 2 | 0 | A |
| 2. | Haz. Sub. Characteristics | | | | | |
| | a. Source Quantity | (9) | 6 | 3 | 0 | A |
| | b. Toxicity/Persistence | (9) | 6 | 3 | 0 | A |
| | c. Water Solubility | (3) | 2 | 1 | 0 | A |
| 3. | Exposure Potential | | | | | |
| | a. Groundwater Use | 9 | (6) | 3 | 0 | B |
| | b. Land Use/Population | 6 | (4) | 2 | 0 | B |
| | c. Surface Water Use | ~~(6)~~ | (6) | 3 | 0 | A |
| | d. Sensitive Environments | (6) | 4 | 2 | 0 | A |
| | e. Direct Contact | 6 | (4) | 2 | 0 | B |
| 4. | Evaluator Assessment of Threat | (13) | 9 | 5 | 0 | A |

*- Add the circled numbers to get the total SAPS score -*

Confirmed Release X Y ___ N  Bonus Points (0, 5, 10) ___

**Bonus Points:** (add 10 points to the total score if there is a confirmed release *with* impacted targets)
(add 5 points to the total score if there is a confirmed release *without* impacted targets)

**Total SAPS Score =** 79 (out of 110 possible points)

**Priority Associated with Score =** H (H, M, L)

**DISCUSSION:**

Discuss your overall impression of the threat posed by the site. Include brief discussion of major factors such as potential or known releases, waste quantity, human and environmental targets, and use of nearby groundwater or surface water. Also discuss any important factors or considerations not addressed in the SAPS scoresheet. Discuss whether you feel the SAPS score generated for the site reflects the overall threat posed by the site to the surrounding population and environment.

LARGE QUANITIES OF PETROLEUM RELATED HAZARDOUS SUBSTANCES RESULTING ~~FROM~~ FROM OPERATIONS AT THE FORMER PORTLAND GAS + COKE COMPANY (GASCO) OIL GASIFICATION FACILITY APPEAR TO HAVE BEEN DISPOSED OF AT ~~IT~~ ON THE WACKER PROPERTY. GROUNDWATER IS LIKELY CONTAMINATED W/ HIGH LEVELS OF BENZENE NEAR THESE DISPOSAL AREAS + ALONG THE GASCO PROPERTY LINE. PETROLEUM RELATED COMPOUNDS HAVE BEEN DETECTED IN SEDIMENTS ADJACENT TO THE SITE AT CONCENTRATIONS 40 TIMES BASELINE. A RI/FS IS REQUIRED AT THE WACKER SITE TO FULLY CHARACTERIZE THE EXTENT OF CONTAMINATION + DETERMINE THE RISKS TO HUMAN HEALTH + THE ENVIRONMENT AND SELECT AN APPROPRIATE REMEDY FOR THE SITE

**RECOMMENDATION:**

- [x] Further Action - High Priority
- [ ] Further Action - Medium Priority
- [ ] Further Action - Low Priority
- [ ] No Further Action
- [ ] Refer To _____ for further consideration
- [ ] Other: _____

**LISTING RECOMMENDATION** – ALREADY LISTED – NO LISTING RECOMENDATION NEEDED

- [ ] Recommend proposal on Confirmed Release List
- [ ] Recommend proposal on Inventory
- [ ] Insufficient information to list on the Confirmed Release List
- [ ] Insufficient information to list on the Inventory
- [ ] Excluded from listing

DEQ SITE ASSESSMENT PROGRAM - STRATEGY RECOMMENDATION

Site Name: Wacker Siltronic Corporation

Site CERCLIS Number: ORD096253737

DEQ ECSI Number: 183

Site Address: 7200 NW Front Avenue
Portland, OR 97210
(T1N/R1W-S13)

Recommendation By: Eric Blischke, Waste Management and Cleanup Division

Approved By: Mike Rosen, Portland Harbor Manager, DEQ Northwest Region (ED) FOR MER

Date: October 8, 1999

The Wacker Siltronic site has been the subject of a previous EPA Preliminary Assessment (October 1989), a DEQ Preliminary Assessment Equivalent (August 1991) and subsequent Site Priority Evaluation / Strategy Recommendation (May 1993), as well as DEQ subsurface soil and groundwater evaluations associated with the Doane Lake Study Area hydrogeological evaluation ( ECSI #36; 1989-91). The purpose of this document is to summarize new site information that has become available since DEQ's May 1993 Site Priority Evaluation.

NOTE: This site (See Figures 1 and 2) is within a 6-mile stretch of the Lower Willamette River in which the U.S. Environmental Protection Agency (EPA) conducted a sediment study in 1997. This area, referred to as the *Portland Harbor*, is between the upstream ends of Sauvie Island (River Mile 3.5) and Swan Island (RM 9.5). The primary purpose of this Strategy Recommendation is to determine whether a specific hazardous substance release or a specific past operation at the site can be linked to contamination documented by EPA in sediments adjacent to the site. Because of this focus, the Strategy Recommendation may omit some historical site information, regulatory issues, or further-action conclusions that might otherwise be included in a DEQ Strategy Recommendation.

## Background, Portland Harbor Sediment Evaluation

In September and October 1997, EPA's contractor, Roy F. Weston, Inc., collected 187 near-shore sediment samples within the Portland Harbor area defined above. Most samples (150) were collected as shallow grab samples within the upper 6 to 17 centimeters (cm) of sediments. 37 deeper composite core samples, from depths of between 55 and 139 cm, were also collected. All samples were analyzed for total metals, semi-volatile organic compounds (SVOCs), total organic carbon (TOC),



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and sediment grain size. Selected samples were also variously analyzed for organotins (TBTs), pesticides, polychlorinated biphenyls (PCBs), chlorinated herbicides, and polychlorinated dioxins and dibenzofurans.

Based on analytical results from this study, which showed extensive sediment contamination, EPA is currently considering Portland Harbor for inclusion on the federal National Priority List (NPL - also known as Superfund).

Between late 1998 and mid-1999, DEQ examined EPA's analytical data to determine potential sources for sediment contamination in the Harbor. Potential sources associated with the most contaminated areas of sediment were sites already active in DEQ's Cleanup Programs.

DEQ categorized other areas of sediment contamination (i.e., those areas not thought to be associated with active Cleanup Program sites) by defining the areas:

- having the highest detected concentration of a given contaminant;
- with contaminant concentrations in the upper five percent of a given contaminant's detected concentrations; and
- having contaminant concentrations above an apparent "baseline range" most commonly detected throughout the harbor area.

DEQ categorized in this manner because there are no established freshwater sediment contaminant concentration guidelines or well-defined background contaminant concentrations for the harbor area. The contaminant "baseline range" was developed by examining the geometric distribution of concentrations for each contaminant detected. Any sediment concentrations that appeared to depart significantly from the ranges most commonly detected were suspected of lying near a potential contaminant source.

Six shallow and one deep sediment sample were collected adjacent to the Wacker Siltronics site as shown in Table 1 and on Figure 3. Sediment samples were found to contain concentrations of low- and high-molecular weight polycyclic aromatic hydrocarbons (LPAHs and HPAHs respectively) up to 100 times baseline concentrations established for Portland Harbor. In addition, PAH related compounds 2-methylnaphthalene, carbazole and dibenzofuran were also detected at concentrations more than 10 times baseline concentrations. Other organic contaminants detected above baseline include 2,4-D, 2,4-DB, pentachlorophenol and bis(2-ethylhexyl) phthalate.

Inorganic chemicals which exceed baseline include barium, cobalt, iron, manganese, selenium, silver, titanium, vanadium and zinc. However, the majority of these detections exceeded baseline by less than 20%.



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Concentrations detected in the deep sediment sample (SD-072A) were generally higher than concentrations detected in the corresponding shallow sediment samples (SD-072). This indicates the contamination may be the result of historical releases of hazardous substances.

Operational History

Wacker Siltronic Corporation (Wacker) operates a silicon wafer fabricating plant on an 85 acre site along the southern bank of the Willamette River in Northwest Portland (see Figures 1 and 2). Silicon wafers are the substrate on which the electronics industry builds more than 90 percent of its integrated circuits (semiconductors).

The site is bounded on the northeast by the Willamette River, on the northwest by a liquefied natural gas (LNG) storage facility owned by Northwest Natural (NWN) (ECSI #84), and on the southeast and southwest by Burlington Northern / Santa Fe Railroad (BNSF) right-of-ways. Doane Creek passes between the Wacker and NWN properties. Koppers Industries, Inc., operates a creosote and tar pitch distribution terminal on property leased from NWN at the western corner of the Wacker site. US Highway 30 (NW St. Helens Road), a former rock quarry, and the Tualatin Mountains lie beyond the BNSF right-of-way to the southwest. Beyond the southeastern BNSF right-of-way lie the Rhone-Poulenc (ECSI #155), ESCO Corp. (ECSI #397), Gould / NL Industries (ECSI #49), and Elf Atochem North America (ECSI #398) environmental cleanup sites[1].

The Wacker property was originally owned by NWN who operated an oil gasification facility (the former GASCO facility) on the property. The Wacker parcel was sold by NWN in 1962 to V. Rosenfeld and H. Anderson. In 1978, this parcel was purchased by the Portland Development Commission (PDC) who in turn sold it to Wacker in August of the same year. Wacker began construction of their silicon wafer manufacturing plant in October, 1978. The plant was completed in December 1979 and operation began in March 1980.

Based on a review of aerial photographs and other historical information, it appears that wastewater settling ponds constructed as part of the former GASCO facility extended onto the northern portion of the Wacker property. These settling ponds were periodically excavated and the dredged tars disposed of in low lying areas on the Wacker property. However, the exact location and nature of these disposal areas is unknown.

Western Transportation operated a fueling dock at the northeast corner of the Wacker Facility which had two large above ground fuel

[1] Both the GASCO and Gould / NL Industries sites are currently listed on CERCLIS. The GASCO, Elf Atochem and Rhone-Poulenc sites are currently undergoing Remedial Investigations; the Gould / NL Industries site is currently in the Remedial Action phase of cleanup. The Gould site has been listed on EPA's National Priority List (NPL).



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tanks. EPA analysis of a 1970 air photo concluded that soils in this area were stained.

A pipeline that appears to have led from the southeast corner of the former GASCO operation (location of a tank farm that stored BTEX, naphthalene, tar and naphtha) to the Western Transportation facility was decommissioned when Wacker bought the site. Decommissioning consisted of capping the pipeline at both ends. A PDC diagram of the pipeline suggests that the pipeline terminated on the southwestern edge of the Wacker site. Apparent soil disturbances observed in a 1957 aerial photo suggest that the pipeline was constructed around the southwestern end of GASCO's wastewater lagoon and continued toward the GASCO tank farm.

The nature of any potential releases from the pipeline is unclear. Petroleum sheens have been released in the river in the Western Transportation boat dock area on two occasions during river dredging operations.

A utility corridor running across the site (See Figure 4) holds two Olympic petroleum pipelines and a sanitary sewer line. There are also indications that a Pacific Northern pipeline passes through the corridor, but this may be a reference to the Olympic pipelines.

One or both of the Olympic pipelines appear to have leaked on at least two occasions. On the first occasion, holes in one of the lines was repaired, but there is no record or documentation of the soil cleanup. On the second occasion, two sets of pipeline pressure tests (several months apart) appear to have indicated a pipeline leak. Bypasses were installed on both pipelines and old pipeline sections appear to have been capped in place. There is no documentation of whether a soil cleanup was performed.

Subsurface petroleum/tar was also encountered during construction of the Wacker wastewater treatment plant (shallow, free-flowing product), prior to the construction of Wacker's FAB 2 facility, and during soil borings and monitoring well construction at the southeastern end of the site.

A historic Chapmen Chemical release of herbicides killed extensive vegetation on the Wacker site in the 1960's. Contamination likely flowed from Doane Lake to North Doane Lake to a stream that flowed to Doane Creek and finally to the Willamette River.

## Regulatory History

### DEQ Cleanup Programs:

Over the past twenty years, a number of incidents involving the release of hazardous substances have occurred at the Wacker site. A summary is presented below.



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February/March 1979: In February 1979, DEQ personnel were called to the Wacker Siltronic facility during its construction to determine the origin of a petroleum release found on the property. An initial sample collected on March 1, 1979 from an undefined clarifier was found to contain 40 hydrocarbon components in the $C_{10}$ to $C_{22}$ range with a peak maximum at $C_{15}$. A sample of diesel fuel obtained from the Olympic Pipeline Company was also analyzed and found to match the sample collected from the clarifier. Another sample collected from an exploratory pit above the pipeline on March 12, 1979 was found to contain hydrocarbons in the $C_8$ to $C_{19}$ range with a peak maximum at $C_{12}$. The DEQ laboratory concluded that this sample did not match the sample obtained from the Olympic Pipeline Company (Olympic). Although the above results were inconclusive, Olympic apparently determined that the pipeline had leaked and made the appropriate repairs.

December 1980: On December 16, 1980, a green color was noted in the wastewater treatment plant's concentrated acid system. A total of 5.5 pounds of chromium was taken to the Arlington hazardous waste landfill for disposal. It was estimated that approximately 1.3 pounds. of chromium discharged to river the following day.

December 1984: Spills at the Wacker facility's trichloroethene (TCE) stripper unit were reported on December 3, 1984 (360 gallons) and again on December 31, 1984 (900 gallons). Contaminated soils were excavated and sent to Arlington for disposal. A concrete containment dike and monitoring well were subsequently installed.

June 1987: On June 25, 1987, a wastewater line containing very weak detergents plugged and water overflowed onto a gravel yard and the main roadway, stormwater catch basin, then to a river outfall.

October 1990: On October 17, 1990 Wacker notified the Olympic Pipeline and National Response Center of a possible leak associated with the Olympic pipeline (EMD # 90-1462). Following the completion of a soil gas and groundwater investigation and pipeline pressure test, approximately 2000 feet of the pipeline was replaced. A summary of the investigation is presented in the Investigative History section of this strategy recommendation.

September 1991: On September 11, 1991 (OERS #91-062) a leak from a weak acid storage tank was reported. The cause of the leak was a sheared valve. Approximately 4,000 gallons of the weak acid was released to the ground; approximately 1000 gallons was subsequently recovered.



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April 1997: A release of caustic rinse water from a ion-exchange regeneration unit due to a severed wastewater pipeline was reported on 4/28/1997.

July 1998: An oil sheen was observed in the river along the Wacker site on July 29, 1998 (OERS #98-1792). The sheen was approximately 20-50 yards long and originated from subsurface sediments. The release occurred during riverbank repair conducted by Advanced American Diving. Silt was being dredged from sediments to be used as backfill in riprap. The contaminated sediments were placed on the bank before being transferred to 8 lined 20-yard drop boxes. Further offshore dredging discontinued and another backfill source was obtained off-site. A reported 75.72 tons of contaminated material was sent to Arlington for disposal. The primary contaminant detected was petroleum. Total petroleum hydrocarbon analysis was performed on eight samples and the following concentration ranges were reported: gasoline: 7.49-69 ppm; diesel: 399-5810 ppm, heavy oil: 293-2970 ppm.

**Pollution Complaints:**

The following pollution complaints were received by DEQ:

- On April 2, 1981, the storage of empty chemical barrels stored in an area that drains to the Willamette River. Subsequent inspection by DEQ determined that this situation did not represent an environmental threat.

- On February 25, 1981, the Arlington hazardous waste landfill reported the disposal of 6000 gallons of chromic and nitric acids (about 20 ppm each) from a spill (tank overflow). Chromic acid had entered a floor drain and sump at the Wacker facility.

**Permits:**

Wacker Siltronics currently holds the following permits:

- Air Contaminant Discharge Permit (ACDP Permit No. 26-3002) issued by DEQ.
- National Pollutant Discharge Elimination System Waste Water Discharge Permit (NPDES Permit No. 101128) issued by DEQ.
- Storm Water Discharge Permit (NPDES No. 1200-Z) issued by DEQ.
- Municipal Pretreatment Program Waste Water Discharge Permit (No. 469-001) issued by the City of Portland.

On January 11, 1988, PCP was detected in one of Wacker's wastewater permit monitoring samples at 0.2 mg/l. The source of this detection is unknown; however, it should be noted that PCP was also detected in Koppers wastewater stream, which discharges near the same location.



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Investigative History

In August, 1977, three soil test borings and penetrometer probes were installed on the Wacker parcel. The sampling was conducted by CH2M Hill and submitted in a September 1977 Geotechnical and Vibration Monitoring Investigation report to Wacker prior to their purchase of the property. Each boring log had multiple references to bitumen, a generic term applied to natural inflammable substances of variable color, hardness, and volatility composed principally of a mixture of hydrocarbons.

In April 1985, CH2M Hill conducted a soil investigation at the Wacker facility. Sample locations are presented in Figure 4. Wacker was concerned that contamination on their property would prevent or hinder the planned expansion of their facility. Seven soil borings were installed in the vicinity of a proposed polysilicon plant in western portion of the Wacker property. The borings were installed to depths ranging from 31.5 to 41.5 feet and were completed as monitoring wells. Soil samples were analyzed for oil and grease, phenols, volatile organic compounds (VOCs), polynuclear aromatic hydrocarbons (PAHs) and pesticides, herbicides and metals according to the extraction procedure - toxicity (EP-Tox) methodology.

Analysis of the soil boring samples detected the presence of chlorinated and aromatic volatiles, various phenolic compounds including pentachlorophenol and elevated concentrations of PAHs. EP-Tox analysis detected low concentrations of barium (below the regulatory threshold) and levels of 2,4-dichlorophenoxy acetic acid (2,4-D) above the regulatory threshold. Oil and grease levels ranged from 0.03% to 0.34%. Soil data are presented in Table 2.

Groundwater samples were collected from the newly installed monitoring wells in July and August 1985 as part of the investigation. Analysis detected the presence of aromatic VOCs (benzene, ethylbenzene and xylene); acetone and methylene chloride (which may represent laboratory contaminants); PAHs; cyanide and low levels of metals. United States Environmental Protection Agency (EPA) Drinking Water Maximum Contaminant Level (MCLs) were exceeded for many of the carcinogenic PAHs, benzene, lead and cyanide. Groundwater data are presented in Table 3.

In 1990, Geraghty and Miller conducted a Hydrogeological Investigation of the Doane Lake Area in northwest Portland. The primary purpose of the study was to evaluate the hydrogeologic conditions in the vicinity of the Gould Superfund site, calculate the zone of influence of potential Gould remedies and assess the impact that groundwater quality in the Doane Lake area could have on potential Gould site remedies.

As part of the investigation, two monitoring wells on the Wacker property were sampled. These included the existing MW-7 installed by CH2M Hill in 1985 and a newly installed intermediate depth well (MW-3I) installed adjacent to the existing MW-3. MW-3I was screened from



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55 to 60 feet while the existing MW-3 was screened from 12 to 27 feet. Low levels of phenol (0.003 mg/l) and PAHs (0.215 mg/l total PAHs) were detected in MW-3I while even lower levels of contamination (.016 mg/l total PAHs) were detected in MW-7 (See Table 3).

In July, 1990, two soil samples were collected from geotechnical borings installed as part of a proposed expansion by Wacker. The soil samples were found to be saturated with a black oily viscous substance. Elevated levels of BTEX, styrene, chlorobenzene and PAHs were detected. Total PAH concentrations detected in the two samples were 10,000 mg/kg and 6,100 mg/kg respectively. $\frac{10,000}{1,000,000} = 1\%$

In October 1990, CH2M Hill conducted a soil gas and groundwater investigation for Wacker to determine whether the Olympic pipeline was the source of subsurface hydrocarbon contamination previously detected on-site. This investigation was conducted in conjunction with Wacker's proposed expansion plans. Groundwater and soil gas samples were collected along a 600 foot length of the utility corridor adjacent to the proposed FAB 2 building site. However, the investigation concentrated on the collection of groundwater samples with the soil gas probes. Groundwater samples were collected just below the water table at a depth of approximately 25 feet. All samples were field analyzed for BTEX and TPH. A limited number of samples were sent to a laboratory for confirmatory analysis.

The results of the investigation detected elevated levels of BTEX and TPH in groundwater. Benzene concentrations ranged from non-detect to 23.3 mg/l. TPH concentrations ranged from 0.012 to 89.1 mg/l (see Table 4 for a summary of the analytical results). The highest concentrations of TPH and benzene were detected at a point south of and immediately adjacent to the pipeline utility corridor. Benzene and TPH concentrations correlated with one another. CH2M Hill concluded that the concentrations of benzene detected in groundwater samples are typical of those associated with a gasoline spill or leak. They further concluded that the location of the highest detected concentrations may indicate the source of the BTEX contamination. In addition to the BTEX contamination, the soil borings installed by CH2M Hill detected the presence of a black viscous substance thought to be associated with coal tar wastes. The visual observations of oil also correlated with the maximum BTEX and TPH concentrations. As a result, CH2M Hill was not able to ascertain the source of the BTEX contamination.

Based on the results of this investigation, Olympic pipeline excavated and pressure tested the pipeline to 250 psi. No obvious signs of contamination were observed and the pressure test was inconclusive. An additional pressure test was conducted by Marmac in February 1991. The test resulted in a failure of the pipeline. It is unclear whether the test caused the failure of the pipeline or whether a leak was present in the pipeline prior to the test. As a result of the leak, Olympic replaced approximately 2000 feet of the pipeline in March, 1991. In a June 1991 letter, Wacker contended that both lines were replaced.



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In 1995, petroleum contaminated soil was encountered during excavation activities associated with the construction of FAB 2 at the Wacker facility. 5490 tons of contaminated soil was thermally treated with a mobile soil remediation unit. Soils were treated under a solid waste letter of authorization issued by DEQ on April 17, 1995. Treated soils were disposed of at the St. Johns Landfill in Portland, Oregon. Due to the lack of adequate confirmation sampling results, it is unclear how much contaminated material was left in place at the conclusion of cleanup activities.

Since 1994, a remedial investigation has been underway at the adjacent GASCO site. A soil boring (B-33) installed adjacent to the Wacker/GASCO property line detected tar contamination to a depth of 67 feet below ground surface (bgs). In addition, groundwater collected from a monitoring well (MW-5-100) installed along the Willamette River adjacent to the GASCO/Wacker property line has been found to contain up to 11,400 ug/l of benzene and 7,400 ug/l of naphthalene.

Site Hydrogeology

The site lies in the northern-most Portland Basin, a major north-southeast trending sediment filled structural depression found in the northern part of the Willamette River valley and adjoining Columbia River valley (Swanson et al, 1993). The basin is filled with recent alluvium, Pleistocene cataclysmic flood deposits, Miocene to Holocene nonmarine sedimentary rocks, and is underlain by Eocene to Miocene volcanic and sedimentary rocks that are exposed along the basin margins.

The youngest deposits are recent alluvium (silt, sand and gravel mixtures) characteristic of an active fluvial environment. These are made up of shoreline, river channel, and adjacent floodplain deposits.

The Wacker Facility lies between U.S. Highway 30 (St. Helens Road) and the Willamette River, at the base of the Portland Hills. The facility was constructed on varying thicknesses of fill comprised of fine to medium sands and silts overlying alluvial floodplain deposits. Aquifers in the fill and floodplain deposits generally are unconfined and localized due to heterogeneity of the deposits. Occurring at various depths in the site vicinity, Columbia River Basalts (CRB) underlie these alluvial deposits. Deep wells installed in fractured CRB can be very productive and important supply wells. Site elevation is about 30 feet above mean sea level.

Pushprobe soil borings advanced along the river on the southeastern portion of the site during an October 1995 subsurface investigation found a surface cover of 4 to 6 inches of 1-inch minus crushed rock, with 4.5 to 7.5 feet of underlying fill comprised of fine to medium sand and sandy gravel. Soils beneath the fill consist of a somewhat



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tighter formation of interlayered silty fine and medium sands and clayey silts extending to depths of at least 36 feet.

In the southern portion of the site, groundwater has been encountered at depths of 14 to 25 feet bgs. In the area of the site's monitoring well network, groundwater flow appears to generally be toward North Doane Lake. However, since the site's monitoring well network covers only a portion of the site, information regarding overall groundwater flow is not available. Local topography suggests that site groundwater should generally flow to the northeast, toward the Willamette River.

Surface Drainage Routes

Site runoff is currently directed to the facility's oil/water separator system, which discharges to the Willamette River. Surface runoff at the southwestern edge of the site is directed along the Burlington Northern Railroad right-of-way via a stormwater catch basin, and discharges to the river about 1/2 mile to the southeast.

Air photos indicate that Doane Creek, which originates in the Portland Hills (Tualatin Mountains), historically passed beneath St. Helens Road near the northern corner of the Wacker facility, and reached the Willamette River by flowing along a route that approximates the current Wacker Siltronic / NWN property line. Beginning in the 1940's GASCO constructed a series of effluent settling lagoons in a low-lying area that extended onto the northwestern portion of the current Wacker Siltronic facility. Overflow from the various wastewater lagoons was directed to Doane Creek. In constructing the largest of these lagoons, a 7.5 acre lagoon, GASCO re-routed Doane Creek along the southwestern and southeastern edges of the lagoon. The creek reached the river along a route that passed beneath the location of Wacker Siltronic's current Process Building.

When developers began filling the Wacker site with rock and dredged river sediments in about 1969, Doane Creek was rerouted along a railroad right-of-way on the southwestern edge of the Wacker site. A catch basin near the southern corner of the Wacker property directed the surface water flow to an 84 inch diameter, concrete, underground storm sewer that passes along the southeastern Wacker property line and discharges to the Willamette River near the base of a Burlington Northern / Santa Fe Railroad bridge over the river (City of Portland Stormwater Outfall No. 22C).

During filling and development of the Wacker property, a drainage ditch, approximating the historic route of Doane Creek, and emptying to the Willamette River, was also constructed along the full length of the NWN/Wacker property line.

In 1986, NWN proposed installing an underground, perforated ceramic drain pipe along the southwestern edge of the Koppers tank farm to relieve water pressure on the containment structure wall, and



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eliminate groundwater infiltration into the tank farm. The drain line would have discharged through the city stormwater outfall at the northeast corner of Wacker. It's not known if the drain was ever installed, but deeper groundwater in this area of the Koppers site is contaminated, and historic Koppers materials loading/unloading spills in this area suggest a potential source for sediment contamination at the northeast end of the Wacker site.

Pathway Summary

The Wacker Facility lies just north of the Burlington Northern/Santa Fe Railroad Bridge in an area of mixed industrial, commercial, and residential use. Approximately 19 single family residences lie within 1/4 mile of the facility. The nearest residences lie southwest of the Wacker Facility across U.S. Highway 30.

The facility is fully fenced along its three upland sides, and is manned 24-hours a day so public access is limited. However, site workers could be exposed to contaminants present in surface soil. In addition, the presence of the Olympic Pipeline across the site indicates that utility trench workers could potentially be exposed to subsurface contaminants through direct contact, inhalation, or incidental ingestion.

Oregon Water Resources Department has a well log for at least one domestic water supply well within 1.0 mile of the Wacker facility. The well is located at much higher elevation to the northwest, along Old Germantown Road. The well is approximately 530 feet deep and is screened within broken basalt.

The nearest significant wetland is located along the west bank of the Willamette River, near the mouth of Multnomah Channel, about three miles downstream from the Wacker facility. North Doane Lake is located just south of the Wacker facility across the BNRR/SF railroad tracks. Because groundwater in the southern portion of the facility flows towards North Doane Lake, site contaminants have the potential to impact North Doane Lake.

Forest Park, a relatively undeveloped municipal park, lies to the northwest, west, and southwest, across U.S. Highway 30. Cathedral Park is located north of the Wacker facility on the east bank of the Willamette River.

Both recreational and subsistence fishing occur within the Lower Willamette River. Commercial fishing within the Portland Harbor is limited to a small Pacific lamprey fishery. Recreational boating, water skiing, swimming, and beach use also occur within the Harbor.

The Lower Willamette River provides habitat for 39 fish species, including populations of wild cutthroat trout, rainbow trout, and mountain whitefish. White sturgeon are plentiful within the Harbor. The Harbor is also an important migratory corridor, nursery habitat,



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and adult foraging area for two runs of chinook salmon, two runs of steelhead trout, and individual runs of coho and sockeye salmon.

Upper Willamette River populations of chinook and steelhead, which migrate through the Harbor, are listed as threatened species under the Federal Endangered Species Act. The Pacific lamprey is considered a federal species of concern.

Great blue herons, cormorants, osprey, mergansers, kingfishers, peregrine falcons, and bald eagles routinely forage within the Harbor. The area is also part of the wintering range for the Aleutian Canada goose. All are protected under the Migratory Bird Treaty Act. The peregrine falcon is federally listed as an endangered species, while the Aleutian Canada goose is federally listed as threatened species. The bald eagle also is a threatened species, but was recently proposed to be removed from this list.

There is little data on the nature and extent of the benthic community within Portland Harbor sediments. However, it is known that contamination in the benthos, which is a protected beneficial use, can be the source of food-chain effects that radiate up to the species listed above, including humans.

The Lower Willamette River is water quality limited for the following toxic compounds:

- Dioxins/furans (water column and sediments);
- Mercury (fish tissue);
- Pesticides (water column and sediments);
- Polynuclear Aromatic Hydrocarbons - PAHs - (water column and sediments); and
- Trace metals (water column and sediments).

A Total Maximum Daily Load requirements (TMDL)was established for 2,3,7,8-TCDD in 1991. The DEQ Water Quality Division is developing TMDLs for these other contaminants.

Conclusions/Recommendations

Contamination of river sediments adjacent to the Wacker site may represent a significant threat to human health and aquatic life within the river. The specific nature and significance of these threats cannot be determined without further characterization and delineation of contamination in groundwater, subsurface soil, and sediments. This conclusion is based on the following findings:

- Historical operations associated with oil gasification processes at the former GASCO site have resulted in petroleum related contamination at the Wacker site. This is evidenced by a review of aerial photographs, the presence of elevated levels of contamination adjacent to the Wacker/GASCO property line and the presence of petroleum contaminated soils encountered and treated



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during excavation activities associated with the construction of FAB 2. PAH concentrations detected in Willamette River sediments adjacent to the Wacker site exceed baseline concentrations by up to two orders of magnitude. Consequently, it appears that the Wacker site has contributed to the observed sediment contamination adjacent to the site. Although downstream concentrations of PAHs were more than twice the PAH concentration detected adjacent to the Wacker site, downstream contamination may be attributed to the known presence of tars at the former GASCO site.

- In addition to historical operations at the former GASCO facility, sediment contamination may also be attributed to pipeline leaks, AST leaks, spills or waste disposal activities associated with the former Western Transportation--facility.

- Concentrations of 2,4-D and 2,4-DB were detected adjacent to the Wacker site at levels exceeding baseline concentrations. However, upstream levels of these contaminants exceed the levels detected adjacent to the Wacker site. In addition, concentrations of 2,4-D and 2,4-DB were highest at the upstream end of the Wacker site. Due to the presence of the former pesticide and herbicide manufacturer, Rhone-Poulenc upstream of the Wacker site, it does not appear that the presence of 2,4-D, and 2,4-DB in Willamette River sediments is related to the Wacker site.

- Wacker uses mercury and chromium in its processes. The site is known to have had chromium spills and discharges large volumes of wastewater known to have contained chromium. Sediment mercury concentrations exceed harbor baseline values approximately 250 feet downstream from the Wacker facility. In addition, chromium concentrations steadily increase along the full length of the Wacker site although chromium concentrations do not exceed baseline concentrations. Wacker also uses antimony in its process, however, sediments along the Wacker site were not analyzed for antimony.

- Wacker currently uses dioctylphthalate as a plasticizer. High concentrations of ethylhexylphthalate (approximately twice baseline concentrations) was observed along the Wacker site. It is unclear whether Wacker ever used this compound, However ethylhexylphthalate was detected in surface waters flowing into the city stormwater inlet that discharges adjacent to the Wacker site and has been detected in groundwater at the Wacker site.

Due the presence of contamination in both uplands and sediments and the high potential for significant groundwater contamination, DEQ has determined that a remedial investigation and feasibility study (RI/FS) is required for the Wacker Siltronics facility. The RI/FS should address potential risks to human health and the environment. The RI/FS should focus on upland as well as sediment issues and be completed in conjunction with harbor-wide investigative activities to



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be completed within the Portland Harbor Study Area. DEQ has determined that these actions warrant a high priority for follow-up.

References:

This following general references were consulted in preparing this Strategy Recommendation:


1. Preliminary Assessment Report, Wacker Siltronic Corporation, Portland, Oregon, prepared for USEPA by Ecology and Environment, Inc., October 1987.

2. DEQ Site Assessment Strategy Recommendation, Wacker Siltronic Corp., ECSI #183, May 15, 1993.

3. Wacker Siltronic Corporation, NL Gould Superfund Site; Doane Lake Study, Liability for Remedial Action Costs Under Oregon Lay, January 31, 1989 (Revised), by Marvin B. During, A Professional Services Corporation. (ECSI File #36, Doane Lake).

4. Region X Photo Analysis of Doane Lake Hazardous Waste Burial Site, Portland, Oregon, June 1980, EMSL-LV Project AMD 8031, Advanced Monitoring Systems Division, Environmental Monitoring Systems Division, Environmental Monitoring Systems Laboratory, Office of Research and Development, USEPA, Las Vegas, NV. (ECSI File #36, Doane Lake).

5. Site History, Wacker Siltronic Corporation, Portland, Oregon, by the Portland Development Commission, March 1985.

6. Hydrogeological Investigation of the Doane Lake Area, Portland, Oregon, prepared by Geraghty & Miller, Inc., or The Industrial Group, Doane Lake Area, February 22, 1991 (Doane Lake Area File, ECSI #36).

7. A Preliminary Report, Soil Investigation for Proposed Polysilicon Plant, Wacker Siltronic Corporation, for Wacker Siltronic Corp., by CH2M Hill Northwest, June 1985.

8. PRP 104(3) Response Final Report, Doane Lake Area, Portland, Oregon, prepared by Tetra Tech, Inc. for USEPA, July 1988.

9. Memorandum of Understanding, by the City of Portland, the Portland Redevelopment Corporation, and Wacker Chemical Corporation, April 1978.

10. First Amendment to Disposition and Development Agreement, between the City of Portland and Wacker Chemical Corporation, July 1978.

11. DEQ Air Contaminant Discharge Permit Files (Permit #26-3002) for Wacker Siltronics.




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12. Portland Harbor Sediment Investigation Report, Multnomah County, Oregon, prepared for US Environmental Protection Agency, by Roy F. Weston, Inc., May 1998.

Attachments:

Table 1: Willamette River Sediment Results

Table 2: Soil Data

Table 3: Groundwater Data (Monitoring Wells)

Table 4: Groundwater Data (October 1990 Investigation)

Figure 1: Site Location Map

Figure 2: Site Layout Map

Figure 3: Sediment Sample Locations

Figure 4: Sample Location Map



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# Table 1

| Contaminant | Units | Down-Stream SD065 0-17 cm | Down-Stream SD067 0-12 cm | Wacker Siltronic SD068 0-17 cm | SD069 0-15 cm | SD070 0-13 cm | SD072 0-14 cm | SD072A 0-84 cm | SD075 0-15 cm | SD077 0-10 cm | Up-Stream SD078 0-17 cm | Up-Stream SD080 0-13 cm | Apparent Portland Harbor Sediment Baseline Maximum Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | ppm | 39000 | 40400 | 37500 | 38300 | 35000 | 30900 | 35700 | 31700 | 30600 | 25500 | 40000 | 42800 |
| Antimony | ppm | NA | NA | NA | NA | NA | NA | <8 | NA | NA | NA | <5 | <5 |
| Arsenic | ppm | <5 | <5 | <5 | <9 | <8 | <9 | <8 | <9 | <10 | <8 | <5 | <5 |
| Barium | ppm | 179 | 190 | 168 | 179 | 167 | 150 | 189 | 180 | 153 | 149 | 175 | 195 |
| Beryllium | ppm | 0.7 | 0.7 | 0.65 | 0.7 | 0.7 | 0.6 | 0.6 | **0.9** | 0.7 | 0.5 | 0.7 | 0.7 |
| Cadmium | ppm | 0.4 | 0.4 | 0.5 | 0.5 | 0.4 | 0.4 | 0.6 | 0.6 | 0.4 | <0.3 | 0.4 | 0.6 |
| Chromium | ppm | 36.5 | 38.9 | 37 | 34.4 | 29.7 | 27.4 | 30.2 | 26.7 | 22.6 | 24.9 | 37.1 | 41 |
| Cobalt | ppm | 19 | 17.8 | 18.2 | **21.5** | **20.3** | **18.4** | **24.8** | **23.9** | **21.8** | 15.4 | 18.3 | 19.7 |
| Copper | ppm | 40.5 | 48.7 | 46.2 | 39.3 | 34.1 | 31.7 | 36.9 | 32.4 | 29.4 | 25.4 | 42.6 | 60 |
| Iron | ppm | 43100 | 43800 | 44100 | **54200** | **53000** | **51900** | **53900** | **54500** | **58600** | 41400 | 44200 | 45000 |
| Lead | ppm | 16 | 27 | 25 | 24 | 19 | 17 | 25 | 24 | 27 | 25 | 14 | 30 |
| Manganese | ppm | 699 | 624 | 681 | 725 | 638 | 591 | **893** | **909** | 605 | 487 | 693 | 810 |
| Mercury | ppm | 0.06 | 0.24 | 0.08 | 0.06 | 0.05 | 0.05 | 0.09 | 0.05 | 0.03 | 0.10 | 0.06 | 0.1 |
| Nickel | ppm | 30 | 32 | 30 | 27 | 25 | 22 | 25 | 22 | 21 | 25 | 30 | 32 |
| Selenium | ppm | 11 | **17** | 12 | **17** | **17** | **16** | **16** | **17** | 14 | 11 | 14 | 15 |
| Silver | ppm | 1.0 | 1.2 | 1.2 | **1.5** | 1.4 | 1.3 | 1.3 | **1.7** | **1.6** | 1.0 | 1.2 | 1.4 |
| Thallium | ppm | <5 | <5 | 5 | <9 | <8 | <9 | <8 | <9 | <10 | <8 | <5 | 13 |
| Titanium | ppm | NA | NA | NA | NA | **2840** | **2740** | **2850** | NA | **3200** | NA | NA | 2075 |
| Vanadium | ppm | 107 | **113** | 110 | **136** | **132** | **125** | **136** | **152** | **147** | 89.1 | 106 | 112 |
| Zinc | ppm | 104 | **150** | **134** | **144** | 117 | 113 | **145** | **120** | **124** | 100 | **131** | 118 |
| 2-Methylnaphthalene | ppb | **11000** | **7600** | **2700** | **210** | **530** | 130 | **980** | **180** | **430** | 24 | <19 | 150 |
| 4-Methylphenol | ppb | 300 | 250 | 160 | 64 | 73 | 250 | <110 | 97 | 68 | 48 | 500 | 680 |
| Benzoic Acid | ppb | <960 | <2000 | <200 | <200 | <190 | <200 | <1100 | <190 | <190 | <190 | <190 | <200 |
| Benzyl Alcohol | ppb | <96 | <200 | <20 | <20 | <20 | <20 | <110 | <19 | <19 | <19 | <19 | <20 |
| Bis(2-Ethylhexyl)phthalate | ppb | <200 | <200 | 150 | 76 | 94 | 210 | 260 | **700** | <180 | **210** | **260** | 390 |
| Butylbenzylphthalate | ppb | <96 | <200 | <20 | <20 | <19 | <20 | <110 | <19 | <19 | <19 | <19 | <20 |
| Carbazole | ppb | **3600** | **1800** | **1700** | **3400** | **2000** | 86 | **660** | **170** | **700** | 40 | <19 | 100 |
| Di-N-Butylphthalate | ppb | <96 | <200 | <20 | <20 | <19 | <20 | <110 | <19 | <19 | <19 | **21** | <20 |
| Di-N-Octylphthalate | ppb | <96 | <200 | <20 | <20 | <19 | <20 | <110 | <19 | <19 | <19 | <19 | <20 |
| Dibenzofuran | ppb | **1600** | **1300** | **700** | **1900** | **2600** | **220** | **3600** | **340** | **160** | 20 | <19 | 100 |
| Dimethylphthalate | ppb | <96 | <200 | <20 | <20 | <19 | <20 | <110 | <19 | <19 | <19 | <19 | <20 |
| Pentachlorophenol | ppb | <480 | <1000 | <98 | <98 | <94 | <99 | <530 | **7.1** | **6.4** | **4.6** | **11** | Detect |
| Phenol | ppb | <96 | <200 | <20 | <20 | <19 | <20 | <110 | <19 | <19 | <19 | <19 | <20 |
| LPAHs (total) | ppb | **165600** | **112400** | **60430** | **65680** | **70574** | **4995** | **31500** | **13490** | **6860** | 425 | 337 | 700 |
| HPAHs (total) | ppb | **268800** | **192000** | **89800** | **58390** | **46990** | **8630** | **18860** | **15260** | **9060** | **3034** | 2134 | 2400 |
| DDTs (total) | ppb | NA | NA | NA | NA | 49.1 | 27.3 | 38.5 | 170 | 163 | **380** | **570** | 220 |
| PCBs (total) | ppb | NA | NA | NA | NA | 51 | <40 | 57 | NA | <760 | NA | NA | <180 |
| Organotins (total) | ppb | NA | NA | NA | NA | 16 | 54 | <22.8 | NA | 44 | NA | NA | 300 |
| 2,4-D | ppb | NA | NA | NA | NA | NA | NA | NA | **9** | **24** | **21** | **93** | <3.3 |
| 2,4-DB | ppb | NA | NA | NA | NA | NA | NA | NA | **19** | **13** | **23** | **130** | <5 |
| TOC | % | 1.5 | **2.2** | 1.8 | 1.1 | 1.1 | 0.97 | 1.2 | 0.89 | 1.3 | 0.98 | 1.5 | 1.75 |
| Water Depth | ft | 10 | 17 | 17 | 9 | 7 | 9.5 | 8 | 10 | 10 | 10 | 36 | |

**Table 2**
**Wacker Siltronic Soil Data**

| | | Date | SS-1 | SS-2 | SS-3 | SS-4a | SS-4b | SS-5 | SS-6 | SS-7a | SS-7b |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chlorobenzene | ppm | 4/30/1985 | 0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 |
| Phenol | ppm | 4/30/1985 | 0.35 | 3.1 | 0.2 | 0.3 | 0.17 | 0.07 | 0.05 | 0.06 | 0.08 |
| o-Cresol | ppm | 4/30/1985 | 0.04 | 3.4 | ND | 0.02 | ND | 0.19 | 0.05 | ND | ND |
| m+p-Cresols | ppm | 4/30/1985 | 0.006 | ND | ND | 0.08 | ND | ND | ND | ND | ND |
| 2,4-Dimethylphenol | ppm | 4/30/1985 | ND | 3.1 | ND | ND | ND | 0.22 | 0.17 | ND | ND |
| 2-Nitrophenol | ppm | 4/30/1985 | ND | 0.20 | ND | ND | ND | ND | ND | ND | ND |
| 2,4-Dinitrophenol | ppm | 4/30/1985 | ND | ND | ND | ND | ND | 0.81 | ND | ND | ND |
| 2-Chlorophenol | ppm | 4/30/1985 | ND | 7.8 | 0.08 | 0.26 | ND | ND | 0.13 | ND | 0.14 |
| 3+4-Chlorophenols | ppm | 4/30/1985 | 0.44 | 17.5 | 0.06 | ND | ND | 1.7 | 0.32 | ND | ND |
| 2,4-Dichlorophenol | ppm | 4/30/1985 | ND | 2.7 | ND | ND | ND | 0.24 | ND | ND | ND |
| 2,4,5-Trichlorophenol | ppm | 4/30/1985 | ND | 1.9 | ND | ND | ND | ND | ND | ND | ND |
| 2,4,6-Trichlorophenol | ppm | 4/30/1985 | ND | ND | ND | ND | ND | 0.22 | ND | ND | ND |
| 2,3,4,5-Tetrachlorophenol | ppm | 4/30/1985 | 4.9 | 256 | ND | 0.4 | ND | 0.23 | 4.7 | 0.06 | 0.25 |
| 2,3,4,6-Tetrachlorophenol | ppm | 4/30/1985 | 0.24 | ND | ND | ND | ND | ND | ND | 1 | ND |
| 2,3,5,6-Tetrachlorophenol | ppm | 4/30/1985 | ND | 4 | ND | 0.58 | 0.11 | 0.33 | 0.55 | ND | 0.46 |
| Pentachlorophenol | ppm | 4/30/1985 | <1 | <1 | <1 | <1 | 0.31 | 6.9 | 5.1 | <1 | <1 |
| 2,4-D (EP-Tox) | ppm | 4/30/1985 | <10 | <10 | <10 | <10 | <10 | 10 | 160 | <10 | <10 |
| Naphthalene | ppm | 4/30/1985 | 6.7 | 360 | <1 | <1 | <1 | 230 | <1 | <1 | <1 |
| Acenaphthylene | ppm | 4/30/1985 | 5.6 | 230 | <1 | <1 | <1 | 24 | <1 | <1 | <1 |
| Acenaphthene | ppm | 4/30/1985 | 8 | 560 | <1 | <1 | <1 | 28 | <1 | <1 | <1 |
| Fluorene | ppm | 4/30/1985 | 5 | 290 | <1 | <1 | <1 | 20 | <1 | <1 | <1 |
| Fluoranthene | ppm | 4/30/1985 | 16 | 530 | <1 | <1 | <1 | 50 | <1 | 1.1 | <1 |
| Pyrene | ppm | 4/30/1985 | 18 | 550 | <1 | <1 | <1 | 57 | <1 | 1.2 | <1 |
| Phenanthrene+Anthracene | ppm | 4/30/1985 | 32 | 1400 | 3 | <1 | <1 | 150 | <1 | 1.6 | <1 |
| Chrysene | ppm | 4/30/1985 | 12 | 92 | <1 | <1 | <1 | 36 | <1 | 1.7 | <1 |
| Benzo(b+k)fluoranthene | ppm | 4/30/1985 | 8 | 120 | <1 | <1 | <1 | 200 | <1 | <1 | <1 |
| Benzo(a)pyrene | ppm | 4/30/1985 | 19 | 120 | <1 | <1 | <1 | 100 | <1 | <1 | <1 |
| Indeno(1,2,3-c,d)pyrene | ppm | 4/30/1985 | <1 | 270 | <1 | <1 | <1 | 7 | <1 | <1 | <1 |
| Benzo(g,h,I)perylene | ppm | 4/30/1985 | <1 | 360 | <1 | <1 | <1 | 25 | <1 | <1 | <1 |
| Oil and Grease | % | 4/30/1985 | 0.34 | 0.15 | 0.059 | 0.914 | 0.03 | 0.19 | 0.054 | 0.065 | 0.059 |

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Table 3

**Wacker Groundwater Data (mg/l)**

| | GW-1 (8/85) | GW-2 (8/85) | GW-3 (8/85) | GW-3I (10/90) | GW-4 (8/85) | GW-5 (8/85) | GW-6 (8/85) | GW-7 (8/85) | GW-7 (10/90) |
|---|---|---|---|---|---|---|---|---|---|
| Volatile Organic Compounds | | | | | | | | | |
| Benzene | 1.1 | 0.1 | 0.39 | ND | ND | ND | 1.2 | ND | ND |
| Toluene | ND | ND | ND | ND | ND | ND | | ND | ND |
| Ethylbenzene | 0.41 | ND | ND | ND | ND | ND | 0.35 | ND | ND |
| Xylene (Total) | 1.2 | 0.032 | ND | ND | 0.015 | ND | 0.43 | ND | ND |
| Semivolatile Organic Compounds | | | | | | | | | |
| Phenol | ND | ND | ND | 0.003 | ND | ND | ND | ND | ND |
| 2,4-Dimethylphenol | 0.027 | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-Methylnaphthalene | | 0.26 | 0.067 | | 0.019 | 0.012 | 0.041 | ND | ND |
| Acenapthene | 0.27 | 0.94 | 0.086 | 0.093 | 0.35 | 0.054 | 0.2 | 0.019 | 0.002 |
| Acenaphthylene | 0.088 | 0.2 | ND | 0.002 | ND | 0.031 | 0.032 | ND | ND |
| Anthracene | 0.039 | 0.63 | ND | 0.002 | ND | ND | ND | ND | ND |
| Benzo(a)anthracene | 0.031 | 0.48 | ND | ND | ND | ND | ND | 0.012 | ND |
| Benzo(a)pyrene | 0.04 | 0.76 | ND | ND | ND | ND | ND | 0.01 | ND |
| Benzo(b)fluoranthene | 0.024 | 0.4 | ND | ND | ND | ND | ND | ND | ND |
| Benzo(ghi)perylene | 0.025 | 0.37 | ND | ND | ND | ND | ND | ND | ND |
| Benzo(k)fluoranthene | ND | 0.12 | ND | ND | ND | ND | ND | ND | ND |
| Chrysene | 0.036 | 0.65 | ND | ND | ND | ND | ND | 0.015 | ND |
| Dibenzo(ah)anthracene | ND | ND | ND | ND | ND | ND | ND | | ND |
| Indeno(123-cd)pyrene | 0.02 | 0.3 | ND | ND | ND | ND | ND | ND | ND |
| Dibenzofuran | 0.077 | 0.075 | ND | 0.004 | ND | ND | 0.024 | ND | 0.003 |
| Fluoranthene | 0.073 | 1.38 | ND | 0.005 | ND | ND | ND | 0.023 | 0.003 |
| Fluorene | 0.095 | 0.44 | 0.013 | 0.022 | 0.053 | 0.012 | 0.035 | ND | 0.003 |
| Naphthalene | ND | 1.9 | 0.6 | 0.77 | 0.35 | 0.058 | 2.1 | ND | 0.005 |
| Phenanthrene | 0.19 | 0.63 | 0.013 | 0.006 | 0.028 | 0.021 | 0.056 | ND | ND |
| Pyrene | 0.081 | 1.43 | ND | 0.004 | 0.014 | 0.01 | 0.01 | 0.011 | ND |
| Carcinogenic PAHs | 0.176 | 3.08 | ND | ND | ND | ND | ND | 0.037 | ND |
| Non-Carcinogenic PAHs | 0.913 | 7.885 | 0.779 | 0.908 | 0.814 | 0.198 | 2.498 | 0.053 | 0.016 |

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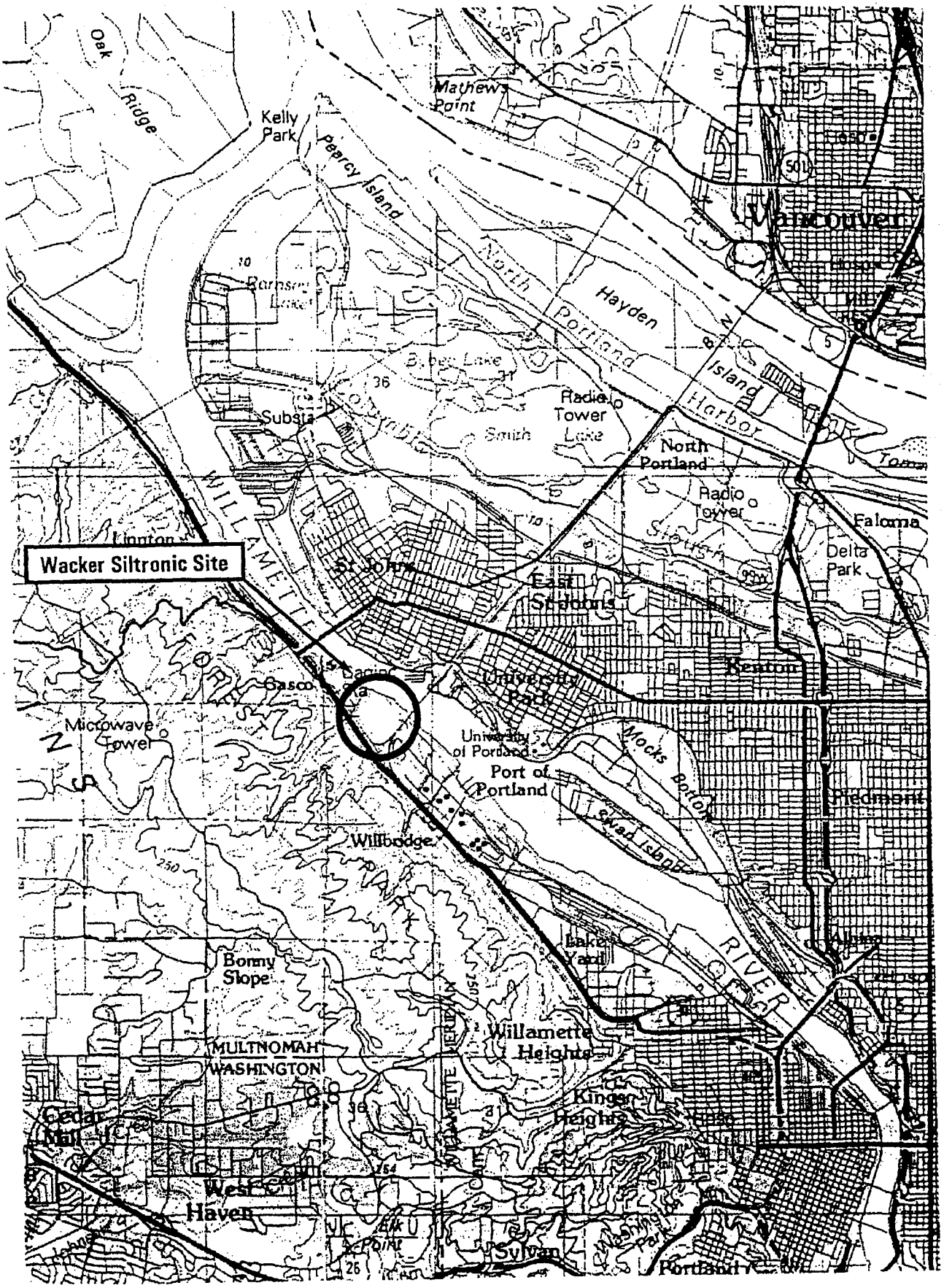
# TABLE 4
## Wacker Siltronic - TPH and BTEX in Groundwater - October 1990

( all concentrations in ppb)

| Sampling Point | Benzene | Toluene | Ethylbenzene | Xylenes | TPH | |
|---|---|---|---|---|---|---|
| GW-01 | <0.1 | 221 | <0.1 | <0.2 | <0.1 | |
| GW-02 | **181** | <0.1 | <0.1 | <0.2 | 131 | |
| GW-03 | **13.5** | 1.8 | 1.5 | 5.6 | 43.6 | |
| GW-04A | **391** | <0.1 | 68 | 45 | 406 | Gasoline |
| GW-04B | **384** | 7.1 | 75 | 55 | 397 | |
| GW-05 | --- | --- | --- | --- | --- | |
| GW-06 | **59.8** | 4.6 | 196 | 17.9 | 510 | Gas+Diesel |
| GW-07 | **17,560** | 13.1 | 126 | 176.6 | 17,000 | |
| GW-08 | **285** | <0.1 | 129 | 65.4 | 369 | Diesel |
| GW-09 | **371** | 13.1 | 74.4 | 66.6 | 791 | Gasoline |
| GW-10 | **1,820** | 23.9 | 471 | 427 | 5,090 | Diesel |
| GW-11A | **18,100** | **3,910** | **2,520** | 3,510 | 56,500 | Gas+Diesel |
| GW-11B | **23,270** | **5,960** | **4,680** | 6,450 | 89,140 | |
| GW-11C | **18,470** | **5,590** | **4,510** | 6,422 | 88,240 | |
| GW-14 | **8.6** | <0.1 | <0.1 | <0.2 | 74.7 | |
| GW-15 | **23.2** | <0.1 | 75.9 | 21.3 | 1,330 | |
| GW-16 | **12,600** | 214 | **1,680** | 1,918 | 21,400 | Diesel |
| GW-17A | **11,300** | 662 | **1,680** | 2,358 | 24,900 | Diesel |
| GW-17B | **10,925** | 574 | **1,370** | 2,042 | 19,350 | |
| GW-18 | **250** | 20.4 | 64.2 | 87.3 | 623 | Gasoline |
| GW-19 | **52.4** | <0.1 | 13.8 | 20.6 | 148 | Gasoline |
| GW-20A | **2,920** | 80.6 | **1,690** | 1,903 | 16,600 | Diesel |
| GW-20B | **3,120** | 85.6 | **1,720** | 1,897 | 14,500 | |
| GW-21 | **2,510** | 349 | 37.6 | 99.6 | 3,140 | |
| GW-22A | <0.1 | <0.1 | <0.1 | <0.2 | 12.1 | |
| GW-22B | 1 | 0.7 | <0.1 | <0.2 | 18.1 | |
| GW-23 | **335** | <0.1 | 419 | 91.9 | 635 | |
| GW-24 | **4,780** | 594 | **926** | 1,550 | 6,330 | Diesel |
| GW-25A | **<0.1** | <0.1 | <0.1 | <0.2 | 26.8 | Diesel |
| GW-25B | **3.7** | <0.1 | <0.1 | 3.6 | 25.3 | |
| GW-26 | **5,920** | 910 | 584 | 881 | 12,040 | Diesel |
| GW-27A | **10,300** | 627 | **1,220** | 1,847 | 16,300 | Diesel |
| GW-27B | **11,400** | 320 | **1,340** | 2,086 | 20,800 | |
| GW-28 | **349** | 9.7 | <0.1 | 22.4 | 328 | |
| GW-29 | **541** | <0.1 | 263 | 19.4 | 735 | |
| **Drinking Water MCL:** | 5 | 1,000 | 700 | 10,000 | ----- | |
| **Fresh Water Aquatic Toxicity -** | | | | | | |
| **Acute:** | 5,300 | 17,500 | 32,000 | ----- | ----- | |
| **Chronic:** | ----- | ----- | ----- | ----- | ----- | |

# FIGURE 1



Wacker Siltronic Site
Oak Ridge
Kelly Park
Mathews Point
Pearcy Island
Vancouver
North Portland Harbor
Hayden Island
Radio Tower
Smith Lake
Substa
North Portland
Radio Tower
Faloma
Delta Park
Lynton
St Johns
East St Johns
Kenton
Gasco
University Park
Microwave Tower
University of Portland
Port of Portland
Mocks Bottom
Swan Island
Piedmont
Willbridge
Lake Yard
Bonny Slope
Willamette Heights
MULTNOMAH
WASHINGTON
Kings Heights
Cedar Mill
West Haven
Elk Point
Sylvan
Portland
RIVER

# FIGURE 2

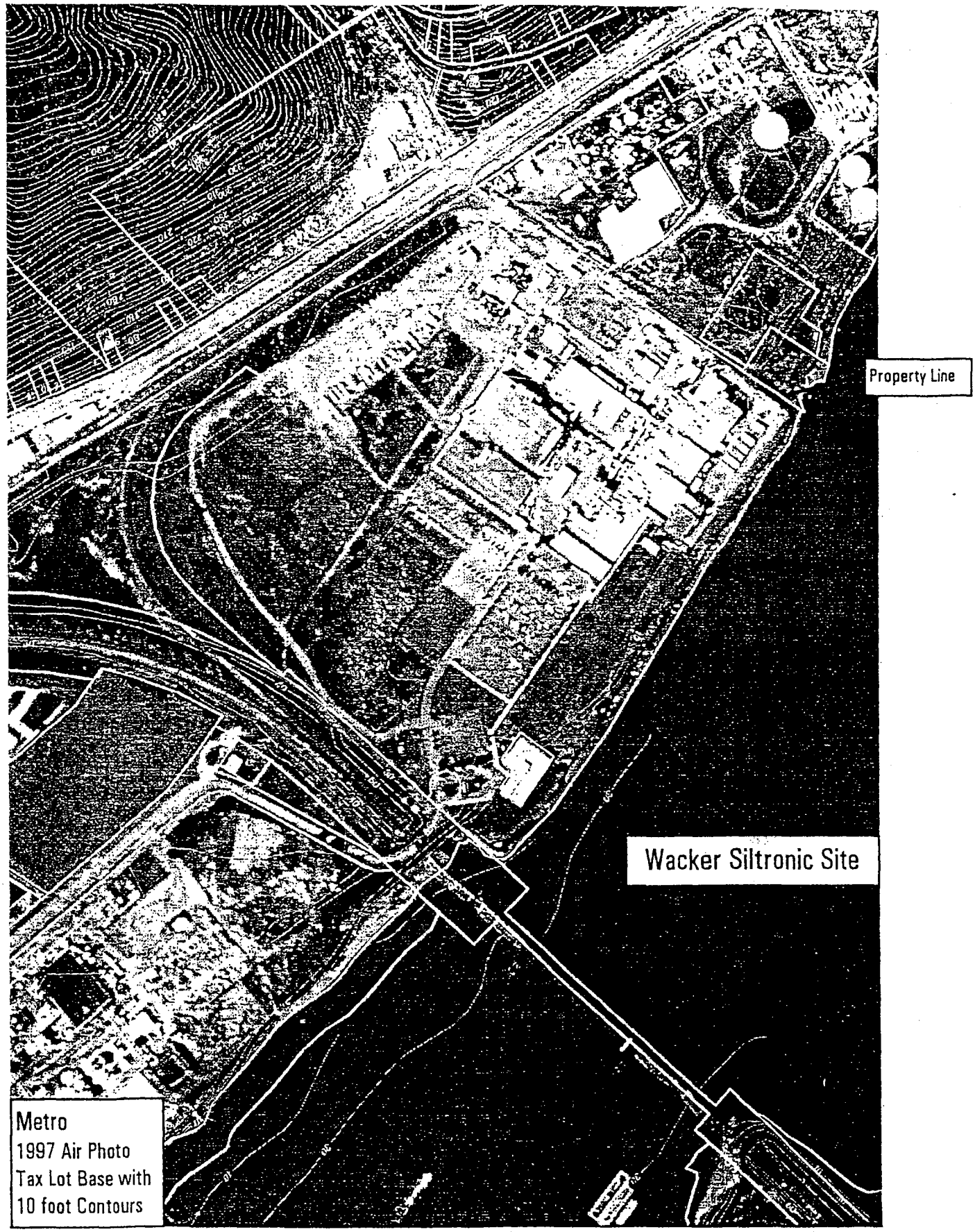
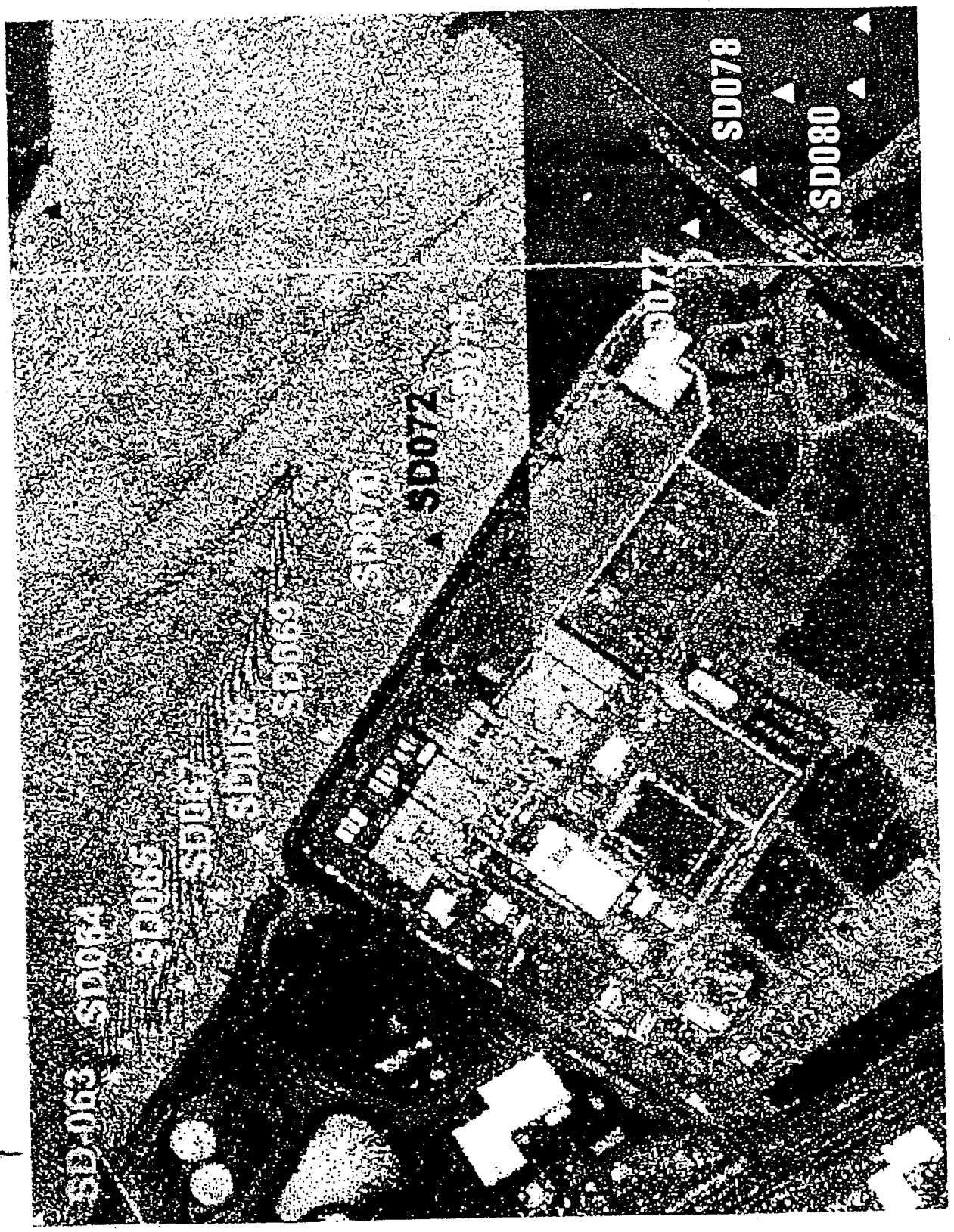
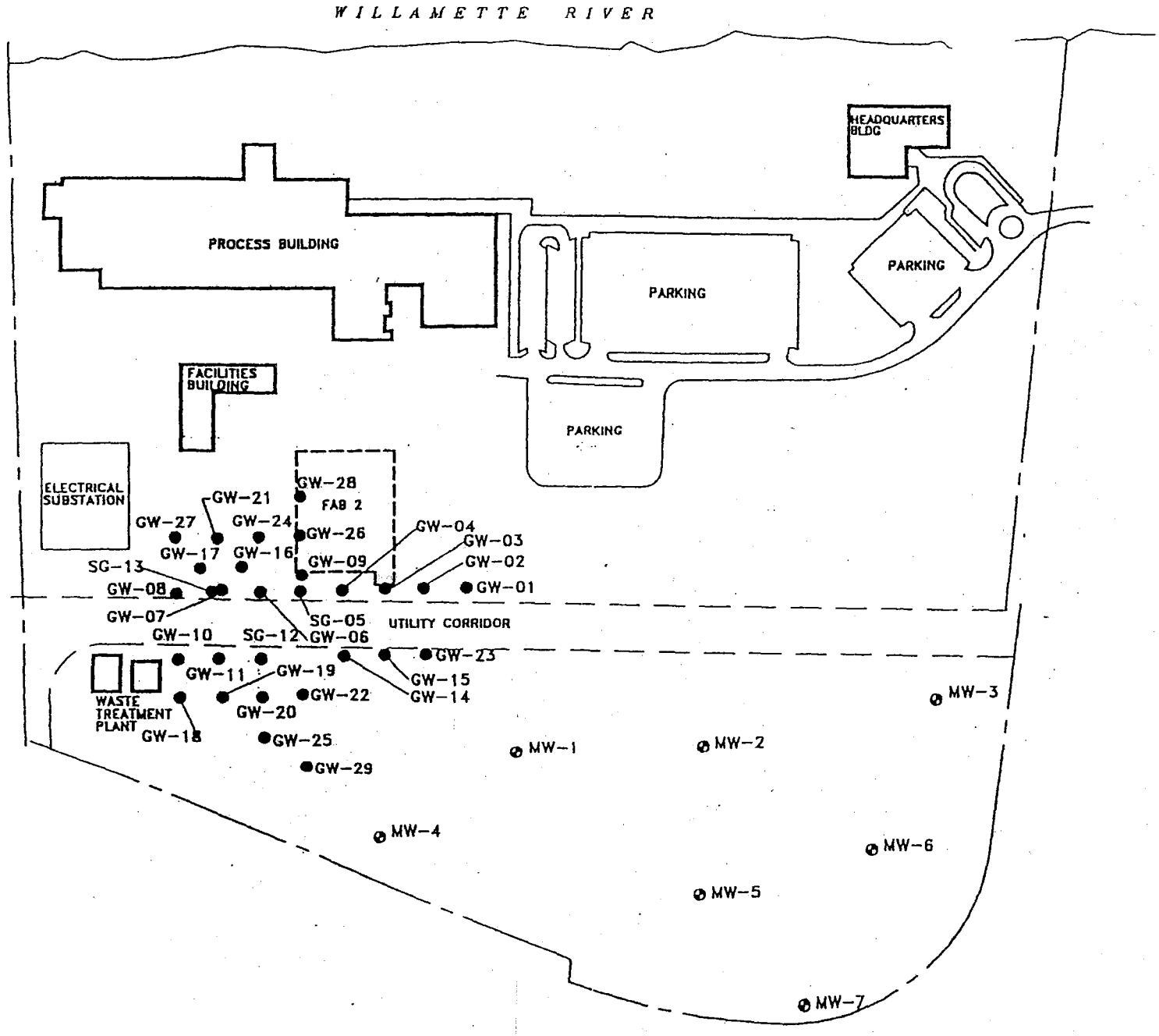

Property Line
Wacker Siltronic Site
Metro
1997 Air Photo
Tax Lot Base with
10 foot Contours

FIGURE 3






N

0 100 200

SCALE IN FEET

LEGEND

- EXISTING FACILITY
- PROPOSED STRUCTURES
- APPROXIMATE GROUNDWATER OR SOIL GAS SAMPLE LOCATION
- APPROXIMATE MONITORING WELL LOCATION

FIGURE 4

Figure 2
SITE PLAN
WACKER SILTRONIC CORPORATION
PORTLAND, OREGON

CH2MHILL

SCOEPA0010556

Oregon
John A. Kitzhaber, M.D., Governor

Department of Environmental Quality
Northwest Region
2020 SW Fourth Avenue
Suite 400
Portland, OR 97201-4987
(503) 229-5263 Voice
TTY (503) 229-5471

June 26, 2001

Mr. Bob Wyatt
Northwest Natural
220 NW Second Avenue
Portland, OR 97209

Re: Final Focused Remedial Investigation Work Plan –
Wacker Siltronic Corporation Property

Dear Bob:

The Oregon Department of Environmental Quality (DEQ) has reviewed the final Focused Remedial Investigation (RI) Work Plan (Work Plan) for the Wacker Siltronic Corporation Property (Wacker) site prepared on your behalf by Hahn and Associates. A redlined version of the RI Work Plan was received on May 11, 2001 and served as the basis for our meeting on May 24, 2001. The final RI Work Plan was by DEQ on June 1, 2001 in accordance with my letter dated May 11, 2001. In addition, a letter clarifying certain aspects of the RI Work Plan (catch basin sampling and metals analyses) was received by DEQ on June 25, 2001.

The final RI work plan accurately incorporates changes agreed to during our May 24, 2001 meeting. In addition, the June 25, 2001 letter accurately describes the agreed upon approach for the collection of catch basin samples and the appropriate inorganic analytical parameters for soil and groundwater samples to be collected during implementation of the RI Work Plan. As a result, DEQ approves the RI Work Plan. As required by DEQ Order No. ECVC-NWR-00-27, site characterization activities must be completed 120 days from DEQ approval of the RI Work Plan (October 24, 2001).

Please contact me at 229-5648 if you have any questions.

Sincerely,

Eric L. Blischke
Project Manager
Voluntary Cleanup and Portland Harbor Section



SCOEPA00010557

cc: Mike Rosen, NWR/DEQ
Rod Struck, NWR/DEQ
Angie Obery, WR/DEQ (Eugene)
Cathryn Young, Wacker Siltronic Corporation

**********
*** TX REPORT ***
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**Wacker Siltronic Corporation**

7200 NW Front Avenue, MS 30
Portland, Oregon 97210-3676
Phone: (503) 219-7406

# FACSIMILE TRANSMITTAL SHEET

**DATE:** July 2, 2001

**TO:** Chris Reive
Tarlow Jordan & Schrader

**PHONE:** (503) 598-5544
**FAX:** (503) 598-7373

**FROM:** Cathryn Young

**PHONE:** (503) 219-7406
**FAX:** (503) 219-7599

**TO:** Kathi Futornick
Limno-Tech, Inc.

**PHONE:** (503) 248-1768
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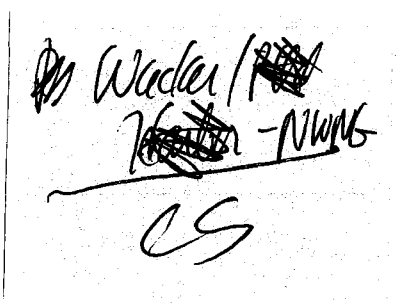
**NUMBER OF PAGES (including this page):** 3

**MESSAGE:**

DEQ letter regarding Final RI Work Plan.



**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL CONSULTANTS

June 25, 2001

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland OR 97201-4987

HAI Project No. 5237

SUBJECT: Stormwater Catch Basin Sampling Activities and Metals Analyses Clarification, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. Blischke:

On June 14, 2001, representatives of Wacker Siltronic Corporation (Wacker), NW Natural, and the Oregon Department of Environmental Quality (ODEQ) conducted a reconnaissance of the Wacker property to evaluate the site with regard to acceptability of, and potential logistical issues surrounding, sampling points as proposed within NW Natural's Focused Remedial Investigation (RI) Work Plan[1] for the property.

As part of the referenced site reconnaissance, the four storm water catch basins designated for sediment sampling within Section 9.3.2 of the Work Plan were observed. Based on these observations, NW Natural and the ODEQ agreed to eliminate the sampling of the catch basin located adjacent to the facility's wastewater treatment plant. This basin was eliminated from the sampling program since it was visually apparent that this basin was being flushed with treated effluent from the wastewater treatment plant, and would therefore not likely yield a sediment sample representative of stormwater runoff or spills from the surrounding area. Further, based on inspection of the surrounding area, it did not appear that this catch basin would be in an area likely to receive impacts from spillage of hazardous substances.

As we discussed during our telephone conversation of June 18, 2001, Ms. Cathryn Young of Wacker notified NW Natural earlier that same day that routine maintenance of site stormwater catch basins was ongoing, and that this maintenance would include clean-out of sediments from within the catch basins to be sampled as proposed within the RI Work Plan. As such, Wacker indicated that unless these sediments could be sampled within the next day or so, then the opportunity to sample them may be lost until such a time that re-sedimentation could occur. As such, Ms. Young agreed that Wacker would implement the catch basin sampling activities, in accordance with Section 9.3.2 of NW Natural's RI Work Plan.

NW Natural understands that these catch basin sampling activities occurred on June 19, 2001, and that you were present to observe. Based on our discussion, you indicated that

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[1] Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon,* June 1, 2001.

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sampling was conducted in accordance with the referenced RI Work Plan. Further, NW Natural understands that Wacker will provide the ODEQ with a brief report summarizing the sampling activities, to include analytical results. These sampling results will be evaluated as part of the Source Control Evaluation Plan as described within Section 8 of the referenced RI Work Plan.

Because catch basin sampling activities as specified within Section 9.3.2 of the RI Work Plan have been completed by Wacker, based on our discussion of June 20, 2001, it is understood that stormwater catch basin sampling activities will not need to be repeated as part of NW Natural's implementation of the RI Work Plan.

Finally, as we discussed during our June 20, 2001 conversation, clarification with regard to metals analyses to be conducted on groundwater and soil/sediment as part of the proposed RI activities is necessary because Tables 4 and 5 of the referenced RI Work Plan were not completely updated during their last revision. As such, metals to be analyzed in various media as part of planned RI activities are identified below, and updated Sampling and Analytical Summary Tables, for insertion into the referenced RI Work Plan, are attached.

The following metals will be analyzed in soil/sediment and groundwater samples collected as part of RI activities since they are used in the manufacturing processes at Wacker.

- Antimony
- Chromium

The following metals will be analyzed in soil/sediment and groundwater samples collected as part of RI activities since they have been identified in Portland Harbor sediments near the Wacker facility at concentrations exceeding Harbor Baseline Maximum concentrations, as reported by ODEQ and as described in the RI Work Plan.

- Cobalt
- Iron
- Manganese
- Selenium
- Silver
- Titanium
- Vanadium
- Zinc



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The following metals will be analyzed in soil/sediment and groundwater samples collected as part of RI activities since they could attributable to possible on-site contaminant sources, as described in the RI Work Plan.

- Arsenic
- Cadmium
- Copper
- Lead
- Nickel

Finally, the following metals will be analyzed in groundwater samples collected as part of RI activities in order to potentially assist in completion of source control modeling studies, as described within the RI Work Plan.

- Barium
- Magnesium

If you have any questions regarding the above, then please do not hesitate to contact me at 503-796-0717.

Sincerely,

Robert Ede, R.G.
Sr. Project Manager

Rede@hahnasoc.com

attachments

c: Mr. Bob Wyatt, NW Natural
Mr. Richard Bach, Stoel Rives LLP
Mr. Steve Cappellino, Anchor Environmental, L.L.C.
Ms. Cathryn Young, Wacker Siltronic Corporation



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**TABLE 4**
**Proposed Soil Sampling and Analytical Summary**

Remedial Investigation Work Plan
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Proposed Sample Location | Depth of Boring (feet bgs) | Area | Soil Core Interval | Soil Samples Selected for Field Screening | Soil Samples Selected for Analyses | Analytical Parameters |
|---|---|---|---|---|---|---|
| P-1 | 64 | River Embankment | Continuous to 64 feet | 1 per 4-foot soil core | One surface and one subsurface sample to be selected based on field screening | Surface: SVOCs, metals[1], cyanide; Subsurface: HCID[2], metals, cyanide TOC |
| P-2 | 100 | River Embankment | Continuous to 64 feet, every 10 feet below | 1 per 4-foot soil core | One sample to be selected based on field screening | HCID[2], metals, cyanide, TOC |
| P-3 | 100 | River Embankment | Continuous to 64 feet, every 10 feet below | 1 per 4-foot soil core | One surface and one subsurface sample to be selected based on field screening | Surface: SVOCs, metals[1], cyanide; Subsurface: HCID[2], metals, cyanide TOC |
| P-4 | 64 | River Embankment | Continuous to 64 feet | 1 per 4-foot soil core | One sample to be selected based on field screening | HCID[2], metals, cyanide, TOC |
| P-5 | 100 | River Embankment | Continuous to 64 feet, every 10 feet below | 1 per 4-foot soil core | One surface and one subsurface sample to be selected based on field screening | Surface: SVOCs, metals[1], cyanide; Subsurface: HCID[2], metals, cyanide TOC |
| P-6 | 64 | River Embankment | Continuous to 64 feet | 1 per 4-foot soil core | One sample to be selected based on field screening | HCID[2], metals, cyanide, TOC |
| P-7 | 64 | River Embankment | Continuous to 64 feet | 1 per 4-foot soil core | One surface and one subsurface sample to be selected based on field screening | Surface: SVOCs, metals[1], cyanide; Subsurface: HCID[2], metals, cyanide TOC |
| P-8 | 100 | River Embankment | Continuous to 64 feet, every 10 feet below | 1 per 4-foot soil core | One sample to be selected based on field screening | HCID[2], metals, cyanide, TOC |
| P-9 | 64 | River Embankment | Continuous to 64 feet | 1 per 4-foot soil core | One surface and one subsurface sample to be selected based on field screening | Surface: SVOCs, metals[1], cyanide; Subsurface: HCID[2], metals, cyanide TOC |
| P-10 | 20 | River Embankment | Continuous to 20 feet | 1 per 4-foot soil core | One sample to be selected based on field screening | HCID[2], metals, cyanide, TOC |
| Beneath Fab 2 Stormwater Outfall | N/A | River Embankment | N/A | N/A | One surface sample | VOCs, SVOCs, metals[1], cyanide, TOC |
| Stormwater Catch Basins | - | Wacker Process Area | N/A | N/A | One sample from each catch basin, to be composited by the laboratory into one sample for analysis | VOCs, SVOCs, metals[1], cyanide, TOC |
| Duplicate | N/A | River Embankment | N/A | N/A | One analyzed sample from boring P-8 | HCID[2], metals, cyanide, TOC |
| **Total** | 740 | - | 161 | 161 | 18 Samples | - |

NOTE:

bgs = below ground surface
EPA = U. S. Environmental Protection Agency
HCID = hydrocarbon identification
PAHs = polynuclear aromatic hydrocarbons
SVOCs = semi-volatile organic compounds, including PAHs
TOC = total organic compound
VOCs = volatile organic compounds

1= metals: Sb, As, Cd, Co, Cr, Cu, Fe, Pb, Mn, Ni, Se, Ag, Ti, V, Zn
2= HCID will be used to determine presence of petroleum or organic impact. If present, impact will be quantified via Northwest Methods and select samples will further be analyzed for VOCs and SVOCs.



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## TABLE 5
## Proposed Water Sampling and Analytical Summary

Remedial Investigation Work Plan
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Proposed Sample Location | Known Potential Contaminant Sources | Sample Interval (feet bgs) | Analytical Parameters |
|---|---|---|---|
| P-1 | Former Gasco Effluent Ponds; Wacker Operational Spills; Olympic Pipeline Releases; Surficial Fill | 8-12[4] | VOCs, PAHs, metals[3], total cyanide, chloride |
| P-2 | Former Gasco Effluent Ponds; Wacker Operational Spills; Olympic Pipeline Releases; Surficial Fill | 20-24[1]; 50-65[2]; 96-100[2] | VOCs, PAHs, metals3, total cyanide, chloride |
| P-3 | Former Gasco Effluent Ponds; Wacker Operational Spills; Olympic Pipeline Releases; Surficial Fill | 20-24[1]; 50-65[2] | VOCs, PAHs, metals[3], total cyanide, chloride |
| P-4 | Former Gasco Effluent Ponds; Wacker Operational Spills; Olympic Pipeline Releases; Surficial Fill | 20-24[1]; 50-65[2]; 96-100[2] | VOCs, PAHs, metals[3], total cyanide, chloride |
| P-5 | Wacker Operational Spills; Olympic Pipeline Releases; Surficial Fill | 20-24[1]; 50-65[2]; 96-100[2] | VOCs, PAHs, metals[3], total cyanide, chloride |
| P-6 | Wacker Operational Spills; Olympic Pipeline Releases; Surficial Fill | 8-12[4]; 20-24[1]; 50-65[2] | VOCs, PAHs, metals[3], total cyanide, chloride |
| P-7 | Former Western Transportation Releases; Wacker Operational Spills; Olympic Pipeline Releases; Surficial Fill | 20-24[1]; 50-65[2] | VOCs, PAHs, metals[3], total cyanide, chloride |
| P-8 | Former Western Transportation Releases; Wacker Operational Spills; Olympic Pipeline Releases; Surficial Fill | 8-12[4]; 20-24[1]; 50-65[2]; 96-100[2] | VOCs, PAHs, metals[3], total cyanide, chloride |
| P-9 | Former Western Transportation Releases; Wacker Operational Spills; Olympic Pipeline Releases; Surficial Fill | 8-12[4] | VOCs, PAHs, metals[3], total cyanide, chloride |
| P-10 | Former Western Transportation Releases; Wacker Operational Spills; Olympic Pipeline Releases; Surficial Fill | 8-12[4] | VOCs, PAHs, metals[3], total cyanide, chloride |
| Combined Effluent / Stormwater Outfall | Wacker Operational Spills; Surficial Fill | Surface water | VOCs, PAHs, metals[3], total cyanide |
| Fab 2 Area Stormwater Outfall | Wacker Operational Spills; Surficial Fill | Surface water | VOCs, PAHs, metals[3], total cyanide |
| - | - | Trip blank | VOCs, PAHs, metals[3], total cyanide |
| - | - | Field equipment blank | VOCs, PAHs, metals[3], total cyanide |
| - | - | Duplicate from P-4 | VOCs, PAHs, metals[3], total cyanide, chloride |

NOTE:

bgs = below ground surface
PAHs = polynuclear aromatic hydrocarbons
VOCs = volatile organic compounds

1 = Sample interval may be modified based on actual depth of water table. Base of screen will be set approximately 4 feet below the water table.

2 = Sample interval may be modified based on actual depth of Alluvial Unit. Screen will be set across zone most likely to be transporting contaminated groundwater, based on geology and field screening.

3 = Dissolved metals (Sb, As, Ba, Cd, Co, Cr, Cu, Fe, Pb, Mg, Mn, Ni, Se, Ag, Ti, V, Zn)

4 = Sample interval may be modified to coincide with actual depth of adjacent utility.



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WACKER
Wacker Siltronic Corporation

April 5, 2001

Eric Blischke
Coordinator, Portland Harbor
Oregon Department of Environmental Quality
2020 SW Fourth Ave., #400
Portland OR 97201-4987

RE: Draft Focused Remedial Investigation Work Plan, dated March 2, 2001
Wacker Siltronic Corporation Property

Dear Mr. Blischke:

Thank you for forwarding to me a copy of the above document. Neither the author nor Northwest Natural Gas Co. (NWNG), provided us a copy for review. Since receipt from you, Wacker and its consultant, Limno-tech (LTI), were able to review the document. We submit the following comments for your consideration.

**Site Use and Development History**

Pacific Gas & Coke Operations: The former settling ponds' locations, use, and deposition are central to understanding the nature of contamination that may be present on what is now the Wacker Siltronic property. The Draft Work Plan has omitted much of this information. Wacker believes that PG&C's history should be expanded to better characterize the settling ponds.

- Portions of several of the settling ponds were located on the current Wacker Siltronic property and received water from sewers, and discharge from tar boxes and lampblack thickeners (CDM, 1987). Prior to the construction of these ponds, tars and oil-water emulsions may have directly discharged to the Willamette River and to low-lying areas (CDM, 1987).

- Our review of aerial photos indicates that the location of the historic settling ponds may have extended farther onto the current Wacker Siltronic property than just the northern corner, as indicated in the Draft Work Plan.

- Based on the information provided in the CDM, 1987 report, it appears that PG&C-related wastes may have been a component of fill placed on portions of the Wacker Siltronic property before and after it had been sold by Northwest Natural, and prior to acquisition by Wacker Siltronic Corporation.

    - PG&C records indicate that occasional cleanout of the settling ponds was done and it is assumed that the dredge materials were disposed in low lying areas on site (CDM, 1987).

    - Additional discussion regarding the chemical composition of the spent oxide material should be included. Spent oxides may be the source of cyanide contamination of the groundwater. Spent oxide was stockpiled on site and during the filling of the property in the late 1960's, three smaller settling ponds located along the property boundary were eliminated and the tar and spent oxides may have been incorporated into the soil fill material in low lying areas (CDM, 1987).

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- In 1970, the Coast Guard detected a slick emanating from the remaining settling pond into the Willamette River. In response, the pond was filled with material from the spent oxide pile and with waste rock from the adjacent quarry (CDM, 1987). The filling of the present-day Wacker Siltronic property from the 1950s and 1960s may have included PG&C plant demolition debris, tank bottom sludges, and other wastes disposed of in low lying areas (CDM, 1987). Wacker Siltronic has encountered demolition debris in several onsite excavations (Bridgewater Group, 2000).

- The presence of coal tar residues was first discovered by Wacker Siltronic in 1984 when the company announced its intent to construct a large polysilicon production plant in the southern portion of the property. As part of the preliminary engineering for design/construction, Wacker Siltronic confirmed the presence of petroleum products, PAHs, and the pesticide, 2,4-D in soil (CH2M HILL, 1985a). In June 1985, Wacker Siltronic notified EPA regarding the potential for the property to be a hazardous waste site as required under Section 103(c) of CERCLA.

**Potential Contaminant Sources**

1980 Chromium Release. No chromic acid was released to soil; however, 1.3 pounds of chromium was discharged to the Willamette River. Under Wacker's NPDES Waste Discharge Permit No. 93450, Wacker is allowed to discharge up to 0.5 pounds per day of total chromium as a monthly average and up to 1 pound per day as a daily maximum.

1981 Chromic and Nitric Acid Leak. The 1999 Bridgewater report references a 1981 chromic and nitric acid leak. The 1981 leak was confined to a sump and storage tank; there was no release to soil, surface water, or groundwater. Wacker removed 6,000 gallons of acid and rinse water solution from the tank and secondary containment by tanker truck, treated and disposed of the material at the hazardous waste landfill in Arlington, OR.

1984 Trichloroethylene Spills. The Draft Work Plan's reference to a TCE release and its use on site needs clarification.

- In December, 1984, 0.33 gallons of TCE was spilled when a surge tank overflowed. The spill did not exceed reportable quantity requirements.

- A second spill occurred 28 days later, again due to overflow from the surge tank. The spill of 11.6 gallons of TCE was reported to DEQ. Sample results of soils around the TCE Stripper (1/2/85) were provided to DEQ. The cleanup plan approved by DEQ included removal of surface soils immediately around the surge tank, the TCE Stripper, and a second area between the Reverse Osmosis/Deionized Water Storage Tanks and sidewalks.

    - Between January 14 and 20, 1985, Wacker removed 113 cubic yards of soil and then resampled the spill area. Wacker disposed of an additional 15 cubic yards of soil on April 10, 1985 at Arlington. Soil sampling results indicated that TCE concentrations in the excavated area were less than 1 mg/kg (Bridgewater, 1999).

    - On April 16, 1995, DEQ issued to Wacker a letter stating that TCE had been removed to below background levels and approving filling the soil excavations, construction of a spill containment area around the stripper, and the cleanup work.

    - VOCs were analyzed in soil and groundwater samples collected in 1985/1990/1991 from borings/monitoring wells WS1 through WS7 and TCE was not detected in any of these samples.

    - As of 1988, Wacker Siltronic stopped using TCE at the facility (Bridgewater, 1999).

1987 Organic Wastewater Overflow. The Draft Work Plan fails to note that a soil sample was taken near the catch basin and analyzed. No cleanup was conducted given the few constituents that were detected and low concentrations of the constituents that were detected (Bridgewater, 1999).

1987 Pentachlorophenol in Wastewater. No PCP was detected in the water sample at a detection limit of 0.002mg/L (1/29/88), or at 0.005mg/L (Feb.,March, April 1988).

1991 Weak Acid Storage Tank Leak. The Draft Work Plan fails to acknowledge:

- The Bridgewater Report, 2000, concludes that the weak acid not recovered (approximately 3,000 gallons) was neutralized within the soil column and did not mobilize any significant quantities of metals.

- That DEQ concluded that the release was not a hazardous waste, did not exceed a reportable quantity, and that no NPDES effluent limits were exceeded. DEQ further concluded that the release required no further investigation, removal, remedial action or long-term environmental or institutional controls.

- That the groundwater data for monitoring wells WS-1 through WS-7 had only low levels of metals (lead <= 52 ug/l, arsenic <= 10 ug/l, cadmium <=3 ug/l, chromium <=10 ug/l, copper <=20 ug/l, nickel <=11 ug/l, zinc <= 50 ug/l and cyanide<=930 ug/l). These data should be compared to naturally occurring levels in regional groundwater, and an analysis of the potential contaminants associated with spent oxides (e.g. cyanide) should be included.

1997 Caustic Water Release. The Draft Work Plan does not report that Wacker calculated that between 36 and 55 pounds of caustic were released with a pH ranging from 7.4 to 11.3. The amount released was below reportable quantities (Bridgewater, 1999).

1998 TPH Release During Flood Damage Repair. The Draft Work Plan omits discussion of the history of this release, which is summarized in the Bridgewater, 1999 report. In brief, an oil sheen was observed when silt was being dredged to be used as backfill behind the rip rap. DEQ noted that the oil sheen was not due to a spill, but rather to an existing problem. The laboratory quantified TPH concentrations and the chromatograms for the samples are consistent with coal tar or creosote standards, and not gasoline or diesel.

**Summary of Previous Investigations**

The Draft Work Plan omits reference to the previous investigations of Camp Dresser & McKee, North Doane's Lake Site Characterization Work Plan, February 1987.

**Preliminary Conceptual Site Model**

Local Hydrogeology The Draft Work Plan states that "information regarding overall groundwater flow is not available". It omits reference to the CDM, 1987 report, the Bridgewater Report, 2000 (page22), and the Geraghty and Miller, 1991, reports, all of which provide information regarding groundwater flow in this area.

Contaminants of Interest

- The Draft Work Plan has eliminated certain COIs, including pesticides, phthalates, and phenols including pentachlorophenol based on what it describes as its understanding of historic PG&C operations. However, it provides no relevant discussion with respect to those historic operations; for example, there is no discussion of PG&C use of herbicides, the contaminants associated with spent oxides and other byproducts of PG&C, the materials PG&C used on site, or any analysis of historical spills that may have impacted what is now Wacker property. As a result, there is little factual basis for eliminating the COIs, as proposed.

- The Draft Work Plan proposes to investigate the potential for acid-induced mobilization. Yet, it does not propose to investigate the presence and concentration of naturally occurring metals or the potential pathways for metals to be naturally released to river sediments.

- The Draft Work Plan omits any recognition that silicon wafer production involves a high purity process that is essentially metal free. The only metal used in the process is chromium, which is used to test for defects during wafer production. Antimony is used in the crystal growth process and is placed in a furnace and heated along with the silicon. Dust emissions are captured by a filter collector system. Therefore, it is unlikely that antimony or chromium would be present in any water-related discharges from the facility (Bridgewater, 1999). Mercury is not used in the manufacturing process (Bridgewater, 1999). Since measured concentrations of such metals in sediments adjacent to the study area only slightly exceed baseline values, sediment data from elsewhere on the river should be analyzed to determine if these metals are naturally occurring in sediments.

Transport and Fate The Draft Work Plan states that contaminant processes are expected to be similar between the Wacker and Gasco facilities.

- While certain aspects of the subsurface may be similar, it has yet to be demonstrated that fate and transport processes are similar enough to extrapolate from the Gasco site to the Wacker RI in order to streamline the process.

- If NAPL is identified, porewater-related investigatory activities developed for the Gasco site may not be easily transferred to the Wacker investigation due to the potential variability of fill materials.

- Although it is stated that the historic creek likely paralleled the river flowing north-northwest across the current Wacker site, the map depicting this possibility is omitted from the figures.

**Source Control Evaluation Plan**

The Draft Work Plan proposes that "a series of groundwater transport models will be conducted to better predict actual chemical concentrations at the sediment water interface in the Willamette River." Wacker believes it is too soon to accurately model the Wacker site, and recommends that model specification be postponed until completion of the investigation.

- The site conceptual model is not sufficiently well-formed, therefore questions to be answered by modeling cannot be defined yet; better site data must be collected and analyzed before the right modeling questions can be asked.

- Model selection must address relevant and appropriate fate and transport processes. These processes cannot be defined until the constituents of concern are better understood.

**RI Site Characterization Plan**

The Draft Work Plan proposes push probe borings at locations depicted on Figure 8 and described in Table 5. Table 5 omits locations P-1, P-9 and P-10 depicted on Figure 8 and fails to include Former Gasco Effluent Ponds under Known Potential Contaminant Sources at locations P-5, P-6, P-7, and P-8.

The Draft Work Plan also proposes five monitoring well clusters. The purpose of one of the clusters, WS-12 on Figure 8, "would be to supplement existing coverage with regard to groundwater elevation and flow". The proposed location of this well cluster, at the primary access to Wacker's manufacturing complex, would seriously interfere with plant operations. Wacker requests that DEQ consider an alternate location, outside of the active portion of the property, for this well cluster.

**Sampling and Analysis Plan**

LTI has made the following recommendations to us regarding sampling and analysis proposed in the Draft Work Plan:

- Appendix G, page 5, section 2.5; page 7, section 3.3: The Sampling and Analysis Plan (SAP) describes field-screening methods that will be used to select samples from each location for laboratory analysis. For the most part, these methods are designed to preferentially select samples that will yield measures of organic compounds, if present. However, the processes controlling the fate and transport of metal in the subsurface are somewhat different from those controlling the fate and transport of organic compounds. Elevated metals concentrations in soil are not always collocated with elevated organic concentrations. A recommended alternative approach for metals sampling in the unsaturated zone is to collect two samples at each location for metals analysis. One sample is collected in the upper undisturbed soil column (where attenuation of metals in surface releases is likely to occur) and one sample is collected near the bottom of the unsaturated portion of the soil boring, for comparison to and differentiation from the overlying soil sample. There is no incremental sampling cost associated with this approach and only a relatively minor increase in analytical costs (i.e. one extra sample at each of ten locations for metals analysis costs about $1,000). The resulting metal data provides a much better starting point than blindly sampling for metals where organic contamination is suspected.

- Appendix G, page 5, section 3: It is not explicitly stated in the Plan that all soil samples will be collected from the unsaturated interval, but this practice is strongly recommended. Soil samples collected for chemical analysis from saturated intervals are of little practical use for several reasons:

    - They are not reliable indicators of source areas

    - As indicators of groundwater contamination they are wasted, because groundwater sampling at the same depth can be substituted as a direct measure of groundwater impacts.
    - Ultimately, remediation of impacts in the saturated interval will be driven by groundwater concentrations and soil impacts will not be considered. While soil impacts in a saturated interval might be considered relevant if there is a need to protect against direct contact (dermal) exposures to utility or construction workers, the saturated depths at the Wacker site make this exposure pathway unlikely.

- Appendix G, page 12, section 7: The list of analytical constituents is unnecessarily limited. For example, the plan specifies "the semivolatile organic compounds (SVOCs) carbazole, dibenzofuran, 2-methylnaphthalene and cresols", but this list excludes phenolic compounds that might be associated with coke-making, which was conducted at the Gasco facility. If SVOCs are to be analyzed using method 8270, limiting the analytical constituents to four compounds will almost certainly ignore useful data on other compounds that the test will yield. All samples collected during the proposed investigation should be analyzed for VOCs using method 8260 and for SVOCs using method 8270 and all analytical parameters should be reported.

Thank you again for providing Wacker a copy of the Draft Work Plan and the opportunity to review and comment. A more timely response would certainly be possible if Wacker were added to the distribution of plans and reports.

Very truly yours,

WACKER SILTRONIC CORPORATION

Cathryn Young
Senior Manager, Central Engineering

cc: Chris Reive

Oregon
John A. Kitzhaber, M.D., Governor

Department of Environmental Quality
Northwest Region
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January 2, 2001

Mr. Bob Wyatt
Northwest Natural
220 N.W. Second Avenue
Portland, OR 97209

Re: Remedial Investigation Scoping Document –
Wacker Siltronic Corporation Property

Dear Bob:

The Oregon Department of Environmental Quality (DEQ) has reviewed the Remedial Investigation (RI) Scoping Document for the Wacker Siltronic Corporation Property (Wacker) site prepared on your behalf by Hahn and Associates. This document was received by DEQ on November 20, 2000 in accordance with DEQ order No. ECVC-NWR-00-27. In general, the RI scoping document describes an acceptable approach to characterization of the Wacker site. DEQ comments on the RI Scoping Document are presented below. It is DEQ's expectation that these comments will be folded into the RI work plan.

**General Comment**

DEQ acknowledges that the overall purpose of the RI at the Wacker site is to "determine the nature and extent of releases of hazardous substances to Willamette River sediments from certain property in Multnomah County, and to develop and implement source control measures to address such releases, if necessary." However, it should be noted that the Scope of Work (SOW) identifies specific RI objectives necessary to achieve the overall purpose. In particular, objective II.B. requires the identification and characterization of "all past and present hazardous substance source areas at the Wacker facility" with a focus "on upland operations that may have resulted in a release of hazardous substances," while objective II.C. requires the evaluation of "all past and present contaminant migration pathways at the Wacker facility." These objectives, as well as other objectives identified in the SOW, must be considered when designing the characterization approach to the Wacker site.

**Specific Comments:**

Section 5 - Potential Contaminant Sources:

- Hazardous substance releases associated with Wacker Siltronic Corporation operations should be included as potential contaminant sources. Information presented in DEQ's Strategy Recommendation or in the "Supplement to DEQ's Strategy Recommendation for



SCOEPA00010572

the Wacker Siltronic Facility" (Bridgewater, 2000) should be used to identify potential sources and prioritize them for characterization. Hazardous substance releases that may require further characterization to assess their potential impact on the Willamette River include the 1984 trichloroethene (TCE) spill and miscellaneous acid spills. In addition, the Wacker site was extensively filled prior to site development. The possibility that some of this fill material may have been contaminated should be considered in the conceptual site model.

Section 6. – Summary of Previous Investigations:

- The investigation summary should include recent investigative efforts associated with the Rhone Poulenc RI/FS. These include the installation of cone penetrometer testing (CPT) borings, GeoProbe borings and monitoring wells on the Wacker site and adjoining Burlington Northern/Santa Fe Railroad property. These investigations have established the depth to basalt along the southern portion of the site and identified the presence of tars in shallow soils at the Wacker site.

Section 7.4.2 – Contaminants of Interest:

- The list of chemicals of interest should be expanded to include TCE (from the 1984 TCE release) and metals (mobilized by acid releases at the Wacker site or through biodegradation of petroleum based contaminants).

Section 7.4.3 – Transport and Fate:

- A section describing current and historic surface water features should be included in the preliminary conceptual site model. In addition to the identification of migration pathways associated with stormwater discharges at the Wacker site and preferential migration pathways resulting from the presence of underground utility corridors, the drainage ditch/outfall that runs along the southern and western property boundary must also be evaluated. It is known that shallow groundwater in the southwestern portion of the site discharges to North Doane Lake. Consequently, the drainage ditch/outfall may serve as a migration pathway for the transport of contamination from the site to the Willamette River.

Section 7.2 – Hydrogeological Conceptual Model:

- The hydrogeologic conceptual model should be supported with available information and appropriate figure. For example, the Remedial Investigation Work Plan appendices should include the following information:
  - Boring logs for Wacker monitoring wells WS-1 through WS-7
  - Boring logs for GASCO monitoring wells MW-5, MW-11, MW-12
  - Boring logs for GASCO explorations B-32, B-33, B-35
  - Boring logs of Wacker borings B-1B
  - Boring logs for Rhone-Poulenc Wells RP-01, RP-03 and RP-06
  - Schematic geologic cross sections parallel and perpendicular to the river bank

- Groundwater Elevation maps showing representative conditions at adjacent facilities (e.g., GASCO, Doane Lake Remnant area, Rhone-Poulenc).

Section 8 – Proposed RI Approach:

- It is DEQ's expectation that the RI will evaluate all upland activities that may have resulted in the release of a hazardous substances. Sampling activities should focus on determining if a release has occurred and if a pathway to surface water or sediments exists. If it is determined through the proposed sampling approach that a pathway from an identified contaminant source to the Willamette River exists, sampling in potential source areas will likely be required to evaluate the elimination of that source in conjunction with source control measures, identify hot spots of contamination and to assess the risk to human health and the environment.

Please have a work plan prepared which incorporates the above comments. Under the terms of Order No. ECVC-NWR-00-27, a work plan is due 60 days from receipt of these comments.

Please contact me at 229-5648 if you have any questions.

Sincerely,

Eric L. Blischke
Project Manager
Voluntary Cleanup and Portland Harbor Section

cc: Mike Rosen, NWR/DEQ
Rod Struck, NWR/DEQ
Kathryn Young, Wacker Siltronic Corporation

**Wacker Siltronic Corporation**

7200 NW Front Avenue
Portland, Oregon 97210
Phone: (503) 243-2020
Fax: (503) 219-7599 Central Engineering

# FACSIMILE TRANSMITTAL SHEET

**TO:** **Chris Reive**
**Tarlow Jordan & Schrader**

**FROM:** **Cathryn Young**

**FAX No:** **(503) 598-7373**

**DATE:** **January 3, 2001**

**NUMBER OF PAGES (including this page): 4**

**MESSAGE/SPECIAL INSTRUCTIONS:**

Re: Portland Harbor

DEQ letter to Northwest Natural, January 2, 2001

I will ask Eric for a copy of the Scoping Document when I call him tomorrow.

**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL CONSULTANTS

May 30, 2002

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland OR 97201-4987

HAI Project No. 5237

SUBJECT: Groundwater Elevation Monitoring Plan, Focused Remedial Investigation (RI) Activities; Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. Blischke:

In correspondence dated February 20, 2002 (Ede to Blischke), NW Natural provided a supplemental work plan to address the collection of groundwater elevation data at, and in the immediate vicinity of, the Wacker Siltronic Corporation (Wacker) property. Subsequent to the submittal of this work plan to the Oregon Department of Environmental Quality (DEQ), it was learned that access to non-NW Natural-owned wells at, and in the vicinity of, the site would not be available. As such, in correspondence dated March 15, 2002 (Blischke to Wyatt), the DEQ requested that NW Natural prepare and submit a revised, *implementable* plan for collecting water levels prior to conducting the fourth (and final) groundwater monitoring event at the site, currently scheduled for late June or early July 2002.

Contained herein is a revised groundwater elevation monitoring plan, to be implemented during the final groundwater monitoring event at the site. The proposed groundwater elevation monitoring activities are fully implementable, and with one exception are identical to those activities that have previously been conducted by NW Natural during the October 2001, December 2001, and April 2002 groundwater monitoring events. The exception involves the completion of a continuous short-term (minimum 48-hour) groundwater elevation monitoring event at select NW Natural-owned monitoring wells at, and adjacent to, the Wacker site. Details are provided below.

## 1.0 Routine Water Level Monitoring

NW Natural's access to those Wacker wells that pre-date initiation of source control investigation activities at the site (i.e., wells WS-1 through WS-5, and WS-10), or to any Aventis Crop Science (Aventis) wells, has not been granted. As such, water levels in only those monitoring wells at the Wacker site that are accessible to NW Natural (WS-8-33, WS-8-59, and WS-9-34) will be measured during the remaining groundwater monitoring event at Wacker. These data, in conjunction with data collected during the October 2001, December 2001, and April 2002 groundwater monitoring events, will support evaluation of

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seasonal fluctuations in groundwater elevations. As during previous sampling events, these water levels will be collected synchronously with water levels collected from wells located at the adjacent NW Natural, Gasco property. If possible, these data collection activities will be coordinated with area-wide water level monitoring activities potentially conducted by others at nearby Aventis and Atofina wells, as well as those Wacker wells not owned by NW Natural. Further, river stage data will be collected from an established benchmark located at the NW Natural – Gasco site, located immediately downstream of the Wacker property.

The static water levels in the monitoring wells will be measured using a Solinst water level indicator (conductive probe). The water levels will be measured from the north side of the top of the casing.

## 2.0 Short-Term Continuous Water Level Monitoring Test

A minimum 48-hour continuous water level monitoring test will take place at those Wacker wells that are accessible to NW Natural (WS-8-33, WS-8-59, and WS-9-34) and at select NW Natural-Gasco facility wells to evaluate interconnectivity with the river. The objective of the continuous water level monitoring test will be to evaluate the significance of tidal and river stage fluctuations in the Willamette River with regard to groundwater flow direction and hydraulic gradients in the vicinity of the Wacker site. Water levels will be collected electronically on a continuous basis (i.e., every 15 minutes) using pressure transducers / data loggers placed within selected individual wells. Water levels will also be simultaneously recorded in the river to compare to the groundwater levels. River level measurement will be collected at the established monitoring station immediately down-river of Wacker at the NW Natural Gasco facility. In addition to the preceding, site-specific rainfall and barometric pressure data will be collected during the course of the test from an existing weather station located on the adjacent NW Natural Gasco property. Sampling points to be included within the short-term continuous water level monitoring test are identified below, and are included on Figure 1.

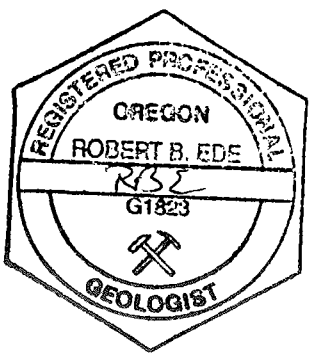
| **Monitoring Point** | **Water-Bearing Zone** |
|---|---|
| WS-8-33 | Surficial Fill |
| WS-8-59 | Alluvial |
| WS-9-34 | Surficial Fill |
| MW-4-56 (Gasco) | Alluvial |
| MW-8-29 (Gasco) | Surficial Fill |
| MW-8-61 (Gasco) | Alluvial |
| Willamette River (Gasco) | - |

If you have any questions regarding this proposal, please do not hesitate to contact me at 503-796-0717.

Sincerely,

Robert Ede, R.G.
Associate

rede@hahnasoc.com




c: Mr. Bob Wyatt, NW Natural
Ms. Patty Dost, Schwabe, Williamson & Wyatt
Mr. Carl Stivers, Anchor Environmental, LLC
Ms. Cathryn Young, Wacker Siltronic Corporation

Willamette River

Former Western Transportation
Docks and Structures
(1930-1950)

SD-062 SD-063 SD-064 SD-065 SD-067 SD-068 SD-069 SD-070 SD-072 SD-075 SD-077

MW-2 MW-3 MW-4 MW-5 MW-6 MW-8 MW-9 MW-10 MW-11 MW-12 MW-13 MW-14 MW-15

P-1 P-2 P-3 P-4 P-5 P-6 P-7 P-8 P-9 P-10 P-11

WS8-59 WS8-33 WS9-34

B-1-8 B-2-8 B-3-8 B-4-8 B-1 B-3 B-5-8 B-101-8 B-102-8 B-HQ-8 B-32 B-33 B-34 B-35 B-SU-8

GP-25 GP-26 RP-01 GP-27 RP-06 GP-11

1981 Chromic / Nitric Acid Spill Location

1984 TCE Spill Location

1997 Caustic Solution Spill Location

WS10-30 location (approximate)

NW Natural

Wacker Siltronic

Utility Easement

Wastewater Treatment Plant Spill Locations

WS-1 WS-2 WS-3 WS-4 WS-5 WS-6 WS-7 W-3-81

RP-03 (abandoned)

RP-03R

PZ-02

NW St. Helens Road

N

**LEGEND**

- Site Boundary
- Existing Structure or Feature
- Railroad Tracks
- Proposed Push Probe Boring Location
- Existing Monitoring Well Location
- EPA Sediment Sampe Location
- Select Boring Location (pre-2001)
- Push Probe Boring Location (HAI, 2001)
- Combined Stormwater / Process Effluent Sewer Line
- Stormwater Sewer Line
- Abandoned Utility Line
- Fire Water Line
- Olympic Petroleum Lines (2-14-inch)
- Natural Gas Line (16-inch/10-inch)

Note: Locations are approximate: Survey of 2001 sample locations not finalized

0 250 500

Approximate Scale in Feet

**Figure 1**

**Monitoring Well and Push Probe Location Map**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

**HAHN & ASSOCIATES, INC.**
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
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503/796-0717

**May 2002**

**Project No. 5237**

SCOEPA00010579

Oregon
John A. Kitzhaber, M.D., Governor

Department of Environmental Quality
Northwest Region
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March 28, 2002

Mr. Bob Wyatt
Northwest Natural
220 NW Second Avenue
Portland, OR 97209

Ms. Cathryn Young
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, OR 97210

Re: Focused Remedial Investigation
Wacker Siltronic Corporation Site

Dear Bob and Cathryn:

As you are aware, a comprehensive groundwater elevation monitoring event will take place on April 2, 2002. Water level measurements will be obtained at the GASCO, Wacker, Rhone Poulenc and Atofina sites. Under the terms of the Focused RI Work Plan for the Wacker Site, water level measurements will be obtained by representatives of Northwest Natural at the three recently installed monitoring wells located at the Wacker site (WS-8-33, WS-8-59 and WS-9-34). Due to site access issues, water level measurements will not be obtained at the RP-01, RP-03R and RP-06 monitoring well clusters as required by the work plan. However, groundwater elevations at these wells will be monitored by representatives of Rhone Poulenc as part of the RI/FS at the Rhone Poulenc site. In addition, water level measurements will also be obtained at monitoring wells WS-3-S, WS-3-I, WS-3-81, WS-6-24, and WS-7-25 as part of the Rhone Poulenc RI/FS.

It is my understanding that groundwater elevation measurements are not currently contemplated at monitoring wells WS-1-22, WS-2-22, WS-4-20, WS-5-20 and the recently found monitoring well in the TCE area, WS-10-30. Because of the time and effort involved in setting up the comprehensive groundwater elevation monitoring event, DEQ requests that Northwest Natural be allowed access to the aforementioned wells for the purpose of obtaining groundwater elevation measurements. This work will be performed as described in the February 15, 2002 letter prepared by Hahn and Associates on behalf of Northwest Natural and the approved Focused RI Work Plan for the Wacker site. Alternatively, this work may be performed by representatives of Wacker Siltronic Corporation in accordance with the approved work plan. This groundwater elevation event represents a one time sampling event and is necessary to properly evaluate groundwater flow directions at the Wacker site. As I indicated in my letter dated March 15, 2002, monitoring wells to be included in any future groundwater monitoring

events will be determined based on the results of the Phase I RI at the Wacker site and submitted prior to the summer 2002 groundwater monitoring event.

In addition, DEQ has requested that chlorinated volatile organic compounds be included in next week's groundwater quality monitoring event at the former GASCO site. DEQ requests that chlorinated VOCs be analyzed for in the following monitoring wells: MW-4-57, MW-5-100, MW-5-175, MW-8-56, MW-14-110, MW-15-50, MW-15-66, and MW-10-56. This information will be used to determine whether the former GASCO site is a source of the trichloroethene and breakdown products detected in groundwater at the Wacker site.

Please contact me at (503) 229-5648 if you have any questions regarding this matter.

Sincerely,

Eric L. Blischke
Project Manager
Voluntary Cleanup and Portland Harbor Section

cc: Mike Rosen, NWR/DEQ
Rod Struck, NWR/DEQ
Jennifer Peterson NWR/DEQ

**Limno-Tech, Inc.**
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March 22, 2002

Mr. Eric Blischke
Project Manager
Voluntary Cleanup and Portland Harbor Section
Oregon Department of Environmental Quality
Northwest Region
2020 SW Fourth Avenue, Suite 400
Portland, Oregon 97201-4987

RE: Response to ODEQ Comments on the Supplemental RI Work Plans for the Wacker Siltronic Corporation Property, Portland, Oregon.

Dear Mr. Blischke:

We respond on behalf of Wacker Siltronic Corporation ("Wacker") to your March 15, 2002 letter to Mr. Bob Wyatt of Northwest Natural Gas Company ("Northwest Natural") and Ms. Cathryn Young of Wacker. Your letter comments on Northwest Natural's and Wacker's separate work plans, and proposes additional investigation activities. Our response below clarifies and comments on a number of the points you raise in your letter, in the order of your original presentation.

**Responses to DEQ's summary of proposed work.**

- "The installation of three geoprobe borings ... for the purpose of characterizing the 1984 trichloroethene release ..." (Page 1, first bulleted item)

Wacker proposed this work in its March 6, 2002 work plan as a supplemental, post-closure investigation. You approved, contingent upon on fulfilling certain requirements you provided in your letter. We conducted this work between March 19, 2002 and March 22, 2002, in accord with your stated requirements. We await the laboratory results.

- "The installation of a geoprobe boring in the vicinity of P-1 for the purpose of characterizing groundwater contamination ..." (Page 1, second bulleted item)

Northwest Natural proposed this work in its March 7, 2002 work plan. We understand that this work was conducted on March 18, 2002. We await the laboratory results.

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Headquarters in: Ann Arbor, MI Regional Office in: Washington DC www.limno.com

- "Water level measurements and groundwater monitoring." (Page 2, first bulleted item)

Northwest Natural proposed this work as a component of its Focused RI Work Plan. As such, we understand it is Northwest Natural's responsibility to perform. We do not know the status of the performance of this work.

**Responses to additional DEQ-requested work.**

- Installation of two monitoring wells at the P-2 location (Page 2, second bulleted item)

Northwest Natural proposed this work as a component of its Focused RI Work Plan. As such, we understand it is Northwest Natural's responsibility to perform. We do not know the status of the performance of this work.

- Upgradient monitoring well cluster. (Page 2, third bulleted item)

Northwest Natural proposed to install a monitoring well cluster in the central portion of the Wacker site (and thus upgradient of the Willamette River) in its Focused RI Work Plan (Section 2.3 Monitoring Well Installation). As such, we understand it is Northwest Natural's responsibility to perform.

In your letter, you request this monitoring well cluster at a specific location ("excavation area identified in aerial photographs") for the dual purposes of characterizing "potential releases" from this area and to provide upgradient control points to contribute to an understanding of groundwater flow direction and gradient at the Wacker property. The request for this location is new and it is not required by the Focused RI Work Plan. As such, Wacker needs to evaluate this location to determine its suitability with respect to Wacker's need to maintain site security and the integrity of its operations.

- The newly found shallow well in the former TCE spill area. (Page 2, third bulleted item)

DEQ's request for an additional alluvial well installation near the newly found shallow well in the former TCE spill area is new and it is not required by the Focused RI Work Plan. Upgradient groundwater characterization is addressed by the monitoring well cluster described immediately above. Moreover, Wacker's experience has shown that installation of an additional well in such close proximity to the Wacker Fab 1 building is likely to disrupt sensitive Wacker operations. For these reasons, Wacker asks that DEQ reconsider its request for this well in the location you describe.

Wacker also asks for permission to decommission the newly found shallow well. This request is explained below.

- Issues regarding groundwater elevation measurements (Page 2, fourth bulleted item)

We are informed that 'access issues' between Northwest Natural and Wacker have not been a significant concern for quite some time. Indeed, so long as Northwest Natural's consultant has afforded Wacker reasonable notice of its plans to come onto the property and performed work described in the approved work plans, there has never been a

problem with Northwest Natural performing such work. Of course, site security is a significant concern and has become more so in the past several months for reasons not related at all to the on-site environmental investigations. Wacker has and will continue to cooperate with the consultants retained by its neighbors to investigate the historical contamination present on its property.

Wacker has executed an Access Agreement with Aventis/Rhone-Poulenc ("R-P"), including several amendments, that specifically address R-P's access needs and there is a very good working relationship in place. Regarding Northwest Natural's access to R-P wells on Wacker's property, we have less information. We are informed that James Benedict, R-P's attorney, has recently informed Wacker's attorney, Christopher Reive, that Northwest Natural has not finalized a form of agreement proposed for access to R-P's wells. We believe that concern to be Northwest Natural's responsibility.

- Evaluation of drainage ditch and City of Portland Outfall 22C (Page 3, first bulleted item)

Wacker does not oppose Northwest Natural sampling in the locations you request. However, we disagree with the significance you place on such data. Samples from Outfall 22C will not necessarily point to any specific source of contaminants, if any are detected. To identify potential sources, DEQ must first identify the areas contributing drainage to that outfall, and characterize the potential sources and associated migration pathways within that drainage area. DEQ's assumption in your letter that the Wacker property is likely the sole source, or even a significant source, of whatever contaminants may be identified by such sampling is simply not supported by any data of which we are aware. It is very likely that upgradient sources such as Doane Lake, R-P, and Koppers may contribute drainage to outfall 22C.

**Responses to DEQ's comments on proposed characterization activities .**

- Soil and groundwater samples collected from the GP02-01, -02 and –03 must be analyzed for a full suite of volatile organic compounds (VOCs) under EPA method 8260B, polycyclic aromatic hydrocarbons (PAHs) via EPA method 8270SIM, cyanide and selected metals in accordance with the approved work plan." (Page 3, second bulleted item)

As noted above, we collected these samples on behalf of Wacker between March 19, 2002 and March 22, 2002. We included the additional parameters you requested for laboratory analysis and we await the laboratory results. However, we would like to clarify that this work was proposed and intended as a supplemental, post-closure investigation of the 1984 TCE spill. As such, the additional parameters requested (other than TCE and its breakdown products) are outside the scope of the investigation described in our March 6, 2002 work plan, which you approved. Wacker understands your concerns and the opportunity to collect additional information that our work affords DEQ. Therefore, Wacker has complied with your request on very short notice. Wacker considers this additional analysis to be a supplement to Northwest Natural's investigations related to the former Gasco site and will promptly provide Northwest Natural with copies of the results.

- "The initial sample depth for the soil boring proposed in the TCE spill area should be below the depth of the 1985 soil cleanup" (Page 3, third bulleted item)

This was always our intention. Our review of the 1985 cleanup records indicates that soils were excavated to a maximum depth of two feet. While not explicitly stated in our March 6, 2002 work plan, the proposed initial soil sample depth of three feet is below the 1985 maximum cleanup depth.

- "The recently found monitoring well in the TCE spill area should be evaluated to determine its suitability for inclusion in the RI monitoring program. If it is found to be suitable, it should be analyzed for VOCs by EPA method 8260B" (Page 3, fourth bulleted item)

Wacker requests that this shallow (29 feet deep) well be decommissioned. It is at least 17 years old and its integrity cannot be assured.

- "DEQ strongly disagrees with the logic for evaluating the proposed soil and groundwater data as presented by LTI." (Page 3, fifth bulleted item)

We believe that the data gathered during the work we proposed on Wacker's behalf, and described above, will allow positive conclusions to be made with respect to any migration of pollutants caused by the 1984 TCE spill. Those include the conclusions stated in our work plan. A non-detect for TCE or its breakdown products at the GP02-01 location would be consistent with the conclusion that the 1985 cleanup was successful in preventing TCE from reaching the groundwater. It is our experience that, even 17 years after a release and cleanup, TCE migration through vadose zone soils will be detectable by investigating for residual impacts in those soils. This is regardless of whether the groundwater plume has moved beyond the release point. This same logic applies to the GP02-02 and –03 locations.

Moreover, we strongly disagree with the statement that, "It is likely that the TCE contamination originated on the Wacker property." We are unaware of any definitive evidence to support this conclusion. Indeed, the current work is specifically intended to answer the question posed by your assumption. If a link exists between the 1984 spill and the concentrations of TCE (11,000 ug/L) detected at the P-2 location, it is highly likely that residual TCE or its breakdown products will be detected in soils and/or groundwater at the locations investigated. It is similarly likely that the absence of such data to establish a pathway to the P-2 location must lead an objective reviewer to conclude that it is *unlikely* that the TCE contamination found near P-2 originated from Wacker's activities.

To the extent that your comments are directed to identifying the source of TCE detected in samples collected at locations along the River during the 2001 Focused RI, we agree with your statement that, "even if no contamination is found in the spill area and the drainage ditch, further investigation to identify the source of the TCE and its breakdown products observed during the groundwater investigation will be required." The following facts support a potential source of chlorinated organic compounds *other than* the 1984 TCE spill at the Wacker site:

- PCE was detected in groundwater on March 20, 1996 at 2.2 ug/l, in a sample collected from 32 feet below ground surface (bgs) in monitoring well MW-11 at the Northwest Natural site.
- Monitoring well MW11 is located in the area of the former Gasco effluent ponds, which are known to have been the repository for liquid wastes from Gasco.
- The Gas Research Institute (GRI, 1996) has identified chlorinated organic compounds including PCE, TCE, dichloroethene (DCE), and vinyl chloride as potential contaminants at manufactured gas plant (MGP) sites.
- PCE is not naturally occurring and cannot be formed from TCE, DCE or vinyl chloride in the environment. Instead, these compounds are common products of the degradation of PCE.
- Concentrations of vinyl chloride in groundwater at Wacker actually increase by a factor of about 700 in the direction of Northwest Natural, from sampling location P5 (1.3 ug/L) to P2 (720 ug/L).
- Preliminary results from the March 2002 supplemental investigation of the former TCE spill area indicate the presence of impacts (e.g., a tar layer was observed at approximately 23-24 feet below surface grade in GP02-01) that appear to be consistent with previously reported impacts attributable to former Gasco site operations.

These facts clearly suggest that TCE impacts could be related to other sources besides the 1984 spill and, more specifically, that the Northwest Natural site is a potential source. At our meeting with you in the later part of December 2001, we provided you with reasonable suggestions for possible additional locations to investigate for TCE source identification. These included:

- Resampling the Northwest Natural monitoring well MW11 and monitoring well cluster MW5, with the intent of focusing analyses on chlorinated solvents at low levels;
- Sampling the shallow and intermediate zone groundwater at or just downgradient of the location of the Northwest Natural former creek bed (where the top of the silt unit forms a trough draining to Wacker property). We recommended vertical aquifer sampling with the installation of a permanent monitoring well cluster at the chosen location. This could be conducted near B-33 or on the Wacker property near the property boundary (where there is clear access for a geoprobe or drill rig). This also would provide data to determine groundwater flow directions at the northern corner of the Wacker site.
- Additional soil sampling of the Northwest Natural waste disposal areas to determine the presence of chlorinated compounds in soil.
- Requiring that detection limits for future laboratory analyses of soil and groundwater samples be low enough to determine the presence of chlorinated compounds that may be associated with high concentrations of BTEX and PNA compounds. In order to detect low level concentration, encore samplers should be considered.

If you have any questions or need additional information, please call me at 734-332-1200 or Kathi Futornick at 503-248-1768.

Sincerely,

Robert J. Betz
Limno-Tech, Inc.

cc: Cathryn Young

**References**

Gas Research Institute (1996). *Management of Manufactured Gas Plant Sites, Volumes 1 and 2*. Amherst, MA: Amherst Scientific Publishers. Gas Research Institute.

Oregon
John A. Kitzhaber, M.D., Governor

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March 15, 2002

Mr. Bob Wyatt
Northwest Natural
220 NW Second Avenue
Portland, OR 97209

Ms. Cathryn Young
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, OR 97210

Re: Focused Remedial Investigation
Wacker Siltronic Corporation Property

Dear Bob and Cathryn:

The Oregon Department of Environmental Quality (DEQ) has reviewed the supplemental work plans for the focused Remedial Investigation (RI) at the Wacker Siltronic Corporation (Wacker) property. These documents were submitted by Hahn and Associates (Hahn) on behalf of Northwest Natural and by Limno-Tech Inc (LTI) on behalf of Wacker. These documents were submitted in response to DEQ's letter dated February 6, 2002 and were received on March 8, 2002 and March 6, 2002 respectively. In addition, DEQ has reviewed the supplemental work plan dated February 15, 2002 that addresses water level measurements. This document was prepared by Hahn and was received by DEQ on February 20, 2002.

Overall, DEQ is concerned that many of the comments identified in DEQ's letter dated January 7, 2002 have not been addressed. Although, it is possible to proceed in a phased approach in some instances, the proposed sampling activities are deficient in a number of areas. In addition, a number of activities required under the terms of the DEQ approved focused remedial investigation (RI) work plan have either not been completed or are not included in the supplemental work plan.

The following activities were proposed in the three supplemental work plans:

- The installation of three geoprobe borings to a maximum depth of 100 feet for the purpose of characterizing the 1984 trichloroethene (TCE) release area and a historic drainage ditch as a preferential migration pathway. Both soil and groundwater samples are proposed.

- The installation of a geoprobe boring in the vicinity of P-1 for the purpose of characterizing groundwater contamination in the vicinity of a historic drainage pathway



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- Water level measurements and groundwater monitoring.

At this time, the following items that were either required under the terms of the approved work plan or specified in the January 7, 2002, have not been proposed:

- Groundwater collected from a GeoProbe boring at the P-2 location was found to contain 11,000 ug/l of TCE. Due to a problem with the analytical laboratory, the data was unavailable at the time monitoring well locations at the Wacker property were selected. Under the terms of the workplan, the detection of elevated concentrations of TCE requires further characterization through the installation of one or more monitoring wells.

  Response: DEQ requires the installation of two monitoring wells at the P-2 location to characterize TCE discharges to the Willamette River. This monitoring well cluster must be installed in time to be included in the comprehensive water level measurements currently scheduled for April 4, 2002. The first monitoring well should target the depth at which the TCE was detected. The second monitoring well installation should be designed to delineate the vertical extent of TCE contamination and determine whether free product is present and whether that free product may be migrating to the Willamette River.

- An upgradient monitoring well cluster was proposed in the work plan. Northwest Natural proposes making use of this newly found shallow well in the TCE spill area. However, neither Northwest Natural nor Wacker is proposing an alluvial well. The work plan requires the installation of the upgradient well cluster in order to develop an understanding of groundwater flow direction and gradient at the Wacker property. In the January 7, 2002 letter, DEQ requested the installation of a monitoring well cluster near the agreed upon upgradient location. Although, a shallow monitoring well near the 1984 TCE spill area was recently "found", a monitoring well that targets the shallow alluvium has not been proposed by either Northwest Natural nor Wacker.

  Response: DEQ is requiring the installation of two upgradient monitoring wells near the excavation area identified in aerial photographs as requested in the January 7, 2002 letter. This well cluster is required to characterize potential releases from the historic excavation area and develop and understanding of groundwater flow direction and gradient at the Wacker property. Alternatively, an alluvial monitoring well in the vicinity of the TCE spill area to complement the shallow well may also be installed. However, characterization of the historic excavation area will still be required in the future. An upgradient monitoring well cluster must be installed in time to be included in the comprehensive water level measurements currently scheduled for April 4, 2002.

- Groundwater elevation measurements adequate to estimate groundwater flow direction and gradient toward the Willamette River have not been obtained as specified in the work plan. This is despite the fact that two rounds of groundwater sampling have been performed. This is the result of site access issues and the lack of the upgradient wells at the Wacker site. It is expected that a set of comprehensive water level measurements, that include a upgradient

monitoring well at the Wacker property will be obtained on April 4th. However, DEQ requires a new plan for getting routine water level measurements. In addition, it is unclear whether access has been granted to the Rhone Poulenc wells for the purpose of performing the short-term continuous water level monitoring test as proposed in the February 15, 2002 supplemental work plan.

Response: DEQ requires the development of an implementable routine water level measurement program that can be initiated during the summer groundwater monitoring event. This plan should be submitted a minimum of 45 days prior to initiation of the summer groundwater monitoring event.

- Evaluation of potential contaminant discharges via the drainage ditch and City of Portland Outfall 22C as specified in the work plan has not yet been completed. This work is held up pending site access.

  Response: The evaluation of the drainage ditch and outfall 22C should be performed as soon as site access is obtained. It is likely that DEQ will require sampling of water from the outfall during the late summer when much of the flow is groundwater. This information will be used to determine whether contaminants present at the Wacker property are migrating to the Willamette River via outfall 22C.

In addition to the characterization activities required under the terms of the approved work plan described above, DEQ has the following comments on the proposed approach:

- Soil and groundwater samples collected from the GP02-01, -02 and -03 must be analyzed for a full suite of volatile organic compounds (VOCs) under EPA method 8260B, polycyclic aromatic hydrocarbons (PAHs) via EPA method 8270 SIM, cyanide and selected metals in accordance with the approved work plan.

- The initial sample depth for the soil boring proposed in the TCE spill area should be below the depth of the 1985 soil cleanup.

- The recently "found" monitoring well in the TCE spill area should be evaluated to determine its suitability for inclusion in the RI monitoring program. If it is found to be suitable, it should be analyzed for VOCs by EPA method 8260B.

- DEQ strongly disagrees with the logic for evaluating the proposed soil and groundwater data as presented by LTI. It is likely that the TCE contamination originated on the Wacker property. The lack of contamination in the spill area may indicate that the contamination plume has moved beyond the release point. Similarly, the lack of contamination present in the drainage ditch area may indicate that the drainage ditch does not represent a preferential migration pathway due to the depth of the release. As a result, even if no contamination is found in the spill area and the drainage ditch, further investigation to identify the source of

the TCE and its breakdown products observed during the groundwater investigation will be required.

Investigation activities specified in the January 7, 2002 letter that are not required under the terms of the work plan are not required until the Phase I work has been completed. This includes the characterization of upland source areas, efforts to identify and control sources of contamination detected in catch basin sediments and the evaluation of surface soils collected near the Willamette River and the evaluation of the need for source control measures to address contaminated groundwater discharges to the Willamette River. The precise scope of theses activities will be determined based on an evaluation of Phase I data. However, as I stated during our meeting on March 1, 2002, the evaluation of river front soil and groundwater data in the absence of upgradient data makes evaluation of the potential for contaminant migration to the Willamette River difficult. Without this data, it is difficult to know if our river front characterization efforts are adequate.

It is our understanding that the proposed GeoProbe installations are scheduled to begin next week. As a result, DEQ approves the proposed work as long as the changes to sample depth and analytical parameters for the TCE spill characterization GeoProbe borings are made as requested above. With respect to the installation of additional monitoring wells, DEQ requests that an approvable proposal for the well installation be submitted within one week of the date of this letter.

Please contact me at (503) 229-5648 if you have any questions regarding this matter.

Sincerely,

Eric L. Blischke
Project Manager
Voluntary Cleanup and Portland Harbor Section

cc: Mike Rosen, NWR/DEQ
Rod Struck, NWR/DEQ
Jennifer Peterson NWR/DEQ

**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL CONSULTANTS

March 7, 2002

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW 4th Avenue, Suite 400
Portland Oregon 97201

HAI Project No. 5237

SUBJECT: Response to ODEQ Request for Supplemental Focused Remedial Investigation (RI) Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. Blischke:

At the request of NW Natural, Hahn and Associates, Inc. (HAI) has prepared this letter to respond to the Oregon Department of Environmental Quality's (DEQ's) January 7, 2002 correspondence (Blischke to Wyatt) generated as a result of DEQ's review of a November 2001 HAI Data Package Report[1]. The referenced DEQ correspondence includes specific recommendations for completion of Phase II RI activities such that further characterization of potential groundwater contaminant sources and groundwater discharges to the Willamette River may be evaluated. Responses provided herein address only those DEQ comments suggesting further investigation of impacts possibly associated with historic operations at the adjacent Gasco property. As we discussed during our meeting on March 1, 2002, we understand that Wacker Siltronic Corporation (Wacker) and Aventis / Rhone Poulenc, Inc. (Aventis) will respond separately to the remainder of the DEQ comments, and you concur with this approach.

Specific DEQ recommendations for potential Gasco-related Phase II investigatory activities are summarized as follows:

1) Because groundwater samples were not collected at the P-1 boring location, and since elevated naphthalene concentrations were identified in soil at this location, the DEQ recommended installation of a Surficial Fill Water-Bearing Zone (WBZ) well and an Alluvial Sand WBZ monitoring well at this location.

2) To develop a thorough understanding of contaminant migration pathways, the DEQ recommended the completion of a push probe investigation targeting possible contaminant source areas located up-gradient of the P-1 and P-3 boring locations.

3) The DEQ recommended the installation of an upland area monitoring well proceed as specified within the original RI Work Plan, but the location be revised such that it is down-gradient of an area of historical excavation at the site.

---

[1] Hahn and Associates, Inc. (2001) *Data Package for Focused Investigation, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon,* November 20, 2001.

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4) The DEQ recommended further investigation to delineate the extent of polynuclear aromatic hydrocarbon (PAH) impacts identified in shallow soils near the P-1 and P-3 boring locations, as well as on the river embankment at the Fab 2 –area stormwater outfall.

5) The DEQ recommended further evaluation of whether identified cyanide concentrations in groundwater are adversely affecting the Willamette River.

Each of the preceding DEQ recommendations is individually addressed in the same order below.

1) As provided within the November 2001 HAI Data Package Report, a thin zone (10-inches thick) of weathered tar was identified on the historical ground surface at the base of the Surficial Fill WBZ at the P-1 push probe location. The soil sample referred to by the DEQ with the elevated naphthalene concentration [60,000 parts per million (ppm)] was a sample of this tar. The presence of elevated naphthalene concentrations within the tar is not anomalous.

   Due to the nature of the identified tar (semi-solid), and because the P-1 boring is near the tar ponds formerly located at the adjacent NW Natural Gasco facility, it is likely that the identified tar is the result of historical discharges associated with the former tar ponds, and is therefore not indicative of ongoing product migration adjacent to the river.

   With regard to groundwater quality, although groundwater samples were not collected at the P-1 boring location, groundwater quality data within the Surficial Fill WBZ and the Alluvial Sand WBZ are currently available at locations approximately 75 feet downriver (MW-5 cluster), and 150 feet upriver (temporary well point P-2). Although available data do not suggest the presence of an unanticipated contaminant source in the upland portion of the site relative to boring P-1, supplemental investigation activities have been proposed (Attachment A) such that localized contaminant transport, if any, associated with the former P-1-area drainage feature, may be further evaluated.

2) As provided within the November 2001 HAI Data Package Report, potential Gasco-related groundwater quality impacts observed within the Surficial Fill and the Alluvial Sand WBZ along the Wacker riverfront were found to be relatively minor as compared to Ambient Water Quality Criteria. Further, no data were collected that contradicted the site conceptual model as provided within the June 2001 RI Work Plan.

   Because there have been no data generated to suggest that possible migration pathways to the river have not been adequately characterized, the suggested source area push probe investigation does not appear warranted at this time. Should results of the pending Source Control Evaluation indicate the presence of on-going contaminant discharges that may be adversely impacting the river, then further



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characterization activities may at that time be proposed such that control measure options could be identified and evaluated.

3) Installation of an upland area monitoring well cluster was originally proposed within the June 2001 Focused RI Work Plan. The intended purpose of such a well cluster was to provide a data point for assistance in interpreting groundwater flow direction and gradient across the central portion of the site. The proposed well was never installed due to site access restrictions.

   Because data obtained during the RI indicate the groundwater migration portion of the Source Control Evaluation will focus on that portion of the property within approximately 400 feet of the adjacent Gasco site, the need for a new upland area control point has been greatly lessened. Specifically, due to proximity, existing monitoring wells at the adjacent Gasco site can be used to effectively estimate hydraulic gradient and groundwater flow direction within the primary area of interest at Wacker.

   However, based on a conversation with representatives of Wacker, an existing monitoring well (well MW-1), screened within the Surficial Fill WBZ, has recently been identified in the vicinity of the former trichloroethene (TCE) spill area. A boring log for this well (Attachment B) indicates it to be constructed of 2-inch diameter PVC with 10 feet of screen, extending to a total depth of 30 feet bgs.

   Based on it's location and design, it appears that well MW-1 (hereto referred to as well WS-10-30) is suitably located to serve as an upland-area groundwater elevation control point within the Surficial Fill WBZ. As such, assuming that field inspection of this well does not indicate potential integrity issues, then the top of casing elevation for this well will be surveyed and groundwater elevation data will be collected from this well during the remaining two groundwater monitoring events at the site (March and June 2002).

   With regard to installation of a piezometer within the Alluvial Sand WBZ, we understand that Wacker will install such a monitoring point as a component of the TCE investigation. Once installed, this monitoring point will similarly be incorporated into the groundwater elevation monitoring program for the site.

   The excavation referred to in the DEQ correspondence, as depicted on aerial photographs between 1955 and 1957, appears to have been a soil borrow pit. Groundwater quality data from down-gradient locations relative to the former borrow pit (borings P-5, P-6 and monitoring well WS-9-34) do not indicate that the borrow pit is acting as an ongoing source of contamination to the river. As such, further investigation activities associated with the former borrow pit do not appear necessary for the purpose of completion of the Source Control Evaluation.

4) The need for further investigation to delineate the extent of PAH impacts identified in shallow soils near the P-1 and P-3 boring locations, as well as on the river embankment at the Fab 2 stormwater outfall, will be evaluated as part of the



SCOEPA00010594

pending Source Control Evaluation. Additional investigation will be proposed if results of the Source Control Evaluation indicate the possible presence of unacceptable impacts to the river, or if additional characterization is necessary to identify and/or evaluate control measure options.

5) Identified concentrations of cyanide in groundwater will be evaluated as part of the pending Source Control Evaluation. Additional investigation will be proposed if results of the Source Control Evaluation indicate the possible presence of unacceptable impacts to the river, or if additional characterization is necessary to identify and/or evaluate control measure options.

A Supplemental Work Plan to address the collection of groundwater quality data at the P-1 push probe location, is provided as Attachment A to this letter. Finally, as Mr. Bob Wyatt discussed with you during a recent telephone conversation, we have determined that collection of water level data at the Aventis wells would result in generation of waste water that may contain a hazardous waste or contain a hazardous substance not attributable to any activity by NW Natural and Gasco. We understand that DEQ concurs that the water level data referred to in Section 9.2.5 of the RI Work Plan need not be collected from the Aventis wells. If you have any questions regarding the above, or the attached Supplemental Work Plan, please contact the undersigned.

Sincerely,

Robert Ede, R.G.
Associate

Attachment (2)

c: Mr. Bob Wyatt, NW Natural
Ms. Patty Dost, Schwabe, Williamson & Wyatt
Mr. Carl Stivers, Anchor Environmental LLC
Ms. Cathryn Young, Wacker Siltronic
Mr. Robert Betz, Limno-Tech, Inc.
Mr. Rod Struck, ODEQ Northwest Region



SCOEPA00010595

# ATTACHMENT A

## Supplemental Remedial Investigation Work Plan
## Wacker Siltronic Corporation Propertry



SCOEPA00010596

**SUPPLEMENTAL**
**REMEDIAL INVESTIGATION WORK PLAN**

Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

March 7, 2002

## 1.0 BACKGROUND

Hahn and Associates, Inc. (HAI) has prepared this supplement to the Oregon Department of Environmental Quality (DEQ) approved Remedial Investigation (RI) Work Plan[1] dated June 1, 2001, for the above referenced property (Figure 1). This supplemental Work Plan was prepared to address certain comments included within DEQ correspondence dated January 7, 2002 (Blischke to Wyatt), generated as a result of DEQ's review of RI results as summarized within a November 2001 HAI Data Package Report[2]. Specific responses to comments provided within the DEQ's January 7, 2001 correspondence have been included in correspondence dated March 8, 2002 (Ede to Blischke).

This Work Plan describes those activities NW Natural proposes to implement to satisfy the objectives identified below. All procedures, protocols, and methods, unless otherwise specified herein, will be carried out according to the June 1, 2001, Final Focused RI Work Plan.

## 2.0 PROJECT OBJECTIVES

### 2.1 Overall Objective

To obtain data sufficient in scope to support completion of Source Control Evaluation activities related to potential impacts to Willamette River sediments attributable to historical Gasco-related impacts potentially present on the Wacker Siltronic Corporation (Wacker) property.

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[1] Hahn and Associates, Inc. (2001) *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon,* June 1, 2001.

[2] Hahn and Associates, Inc. (2001) *Data Package for Focused Investigation, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon,* November 20, 2001.

### 2.2 Specific Objective

To obtain supplemental groundwater quality data in the vicinity of the former "boring P-1 area" drainage feature such that localized contaminant transport, if any, associated with this former drainage feature, may be adequately evaluated with regard to the need for implementation of source control measures.

## 3.0 SUPPLEMENTAL CHARACTERIZATION PLAN

As provided within the November 2001 HAI Data Package Report, a thin zone (10-inches thick) of weathered tar was identified on the historical ground surface located at the base of the Surficial Fill water-bearing zone (WBZ) at the P-1 push probe location (Figure 1). The presence of this tar fits the current conceptual site model. The nature and location of the tar suggests that it is the result of historical discharges associated with the former tar ponds, and is therefore not indicative of ongoing product migration adjacent to the river. No tar or otherwise anomalous conditions were identified in soils below the Surficial Fill WBZ.

Due to the proximity of boring P-1 to the former tar ponds at the adjacent Gasco site, and because the P-1 boring location corresponds to a former "pre-tar pond development" drainage feature, it is proposed that groundwater quality data be collected from both the Surficial Fill WBZ and from the upper portion of the Alluvial Sand WBZ at this location in order to supplement currently available groundwater quality data for the area. This supplemental groundwater quality data will allow for a thorough evaluation of whether the former drainage feature has resulted in a localized zone of preferential contaminant migration at the northern portion of the property. Specific details for the proposed groundwater sampling activities are described below.

### 3.1 Push Probe Installation and Sampling Activities

In order to more completely evaluate concentrations of contaminants of potential concern (COPCs) in groundwater at the location of the former P-1 area drainage feature, it is proposed that two temporary well points (P-12 and P-12A) be installed and sampled at this location (Figure 1) utilizing push probe methodology as detailed within Appendix G of the June 1, 2001 Focused RI Work Plan.

Soils across the entire thickness of the Surficial Fill Unit in boring P-12 will be screened and described in order to determine the depth to the water table and to verify the depth of the silt unit at this location. Collection and analyses of soil samples are not proposed since contaminant distribution data have already been determined at the adjacent P-1 boring location.

After ascertaining the depth to the water table within the Surficial Fill WBZ at boring P-12, a temporary well point will be advanced within a new boring (P-12A) to a depth of approximately 4-feet below the water table. A groundwater sample will then be collected as per procedures provided within the June 1, 2001 Focused RI Work Plan.

After sampling, the temporary well point will be removed from the boring and a 3.25-inch outside diameter (OD) steel casing will be driven through the Surficial Fill WBZ and into the upper 6-inches of the underlying silt unit. This casing will provide for isolation of the thin zone of tar located immediately above the silt unit at this portion of the site, thereby preventing contact with push probe tooling to be advanced into the underlying Alluvial Sand WBZ.

With regard to sampling within the Alluvial Sand WBZ, because lithologic data for this unit is presently available from the adjacent P-1 push probe location, further screening and description of soils beneath the silt unit is not proposed. Instead, a temporary well point will be advanced into the Alluvial Sand WBZ directly to the targeted groundwater sampling depth of 58 feet bgs, with groundwater sampling to occur across a depth interval of 54 to 58 feet bgs. This proposed sampling interval corresponds to sampling intervals from nearby borings / wells, and will allow for evaluation of possible localized impacts within the Alluvial Sand WBZ that could possibly be attributable to the former overlying drainage feature.

Subsequent to collection of the Alluvial Sand WBZ groundwater sample, the temporary well point and the outer casing within the Surficial Fill WBZ will be removed and the bore hole will be pressure grouted from bottom to top as specified within the June 1, 2001 Focused RI Work Plan.

Figure 2 depicts the location of the proposed temporary well points on a hydrogeologic cross-section that parallels the riverfront through the Wacker and adjacent NW Natural Gasco properties.

### 3.2 Laboratory Analyses

Collected groundwater samples will be handled and analyzed as per procedures identified within the June 1, 2001 Focused RI Work Plan. Analyses will be conducted for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), total and amenable cyanide, as well as for those dissolved metals previously identified as COPCs within the June 1, 2001 Focused RI Work Plan.

### 3.3 Investigative-Derived Waste Management

Soil cuttings, as well as drilling, decontamination, and purge water will be generated during the proposed monitoring well installation activities. All investigative-derived waste (IDW) will be containerized, labeled, and left on-site pending characterization and a determination of an appropriate disposition.

## 4.0 PROJECT SCHEDULE

The investigatory activities described above have tentatively been scheduled to occur during the week of March 18, 2002, and are anticipated to take one day to complete. Results from the supplemental investigation will be provided within the first RI Progress Report to be prepared subsequent to receipt of finalized laboratory data reports.

Figure
1

Boring Location and Cross-Section Location Map

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Willamette River

Former Channelized Creek Discharge
(1913 - 1941)

Former Channelized Creek Discharge
(1941 - 1967)

Former Western Transportation
Docks and Structures
(1930-1950)

Area of Dredging-Induced Sheen (1998)

Former Shell Transfer Facilities
(1913-1940)

SD-062 SD-063 SD-064 SD-065 SD-067 SD-068 SD-069 SD-070 SD-072 SD-075 SD-077

A A'

MW-2 MW-3 MW-4 MW-5 MW-6 MW-7 MW-8 MW-9 MW-10 MW-11 MW-12 MW-13 MW-14 MW-15

P-1 P-2 P-3 P-4 P-5 P-6 P-7 P-8 P-9 P-10 P-11 P-12, P-12A

WS8-59 WS8-33 WS9-34

B-1-8 B-2-8 B-3-8 B-4-8 B-5-8 B-HQ-8 B-1 B-3 B-101-8 B-102-8 B-SU-8 B-32 B-33 B-34 B-35

GP-25 GP-26 GP-27 RP-01 RP-06

NW Natural

Former Lowland
(1913 - 1971)

Former Gasco
Effluent Ponds
(1941-1955)
Filled by 1971

Former Lowland
Ponded Area

1981 Chromic / Nitric
Acid Spill Location

1984 TCE
Spill
Location

1997 Caustic
Solution Spill
Location

WS10-30 location
(approximate)

Wacker Siltronic

Approximate Area of 1979
Olympic Pipeline
Leak /Investigation

Limit of Spent Oxide /
Lampblack Fill
(1955-1970)

Utility Easement

WS-1 WS-2 WS-3 WS-4 WS-5 WS-6 WS-7 W-3-81

Wastewater
Treatment Plant
Spill Locations

Approximate Limit of Waste Product Fill (1970)

Former Creek

Former N. Doane Lake Remnant

GP-11

RP-03
(abandoned)

RP-03R

PZ-02

NW St. Helens Road

N

LEGEND

- Site Boundary
- Existing Structure or Feature
- Railroad Tracks
- Proposed Push Probe Boring Location
- Existing Monitoring Well Location
- EPA Sediment Sampe Location
- Select Boring Location (pre-2001)
- Push Probe Boring Location (HAI, 2001)
- Combined Stormwater / Process Effluent Sewer Line
- Stormwater Sewer Line
- Abandoned Utility Line
- Fire Water Line
- Olympic Petroleum Lines (2-14-inch)
- Natural Gas Line (16-inch/10-inch)

Note: Locations are approximate: Survey of 2001 sample locations not finalized

0 250 500
Approximate Scale in Feet

HAHN & ASSOCIATES, INC.
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503/796-0717

March
2002

Project No.
5237

SCOEPA00010600

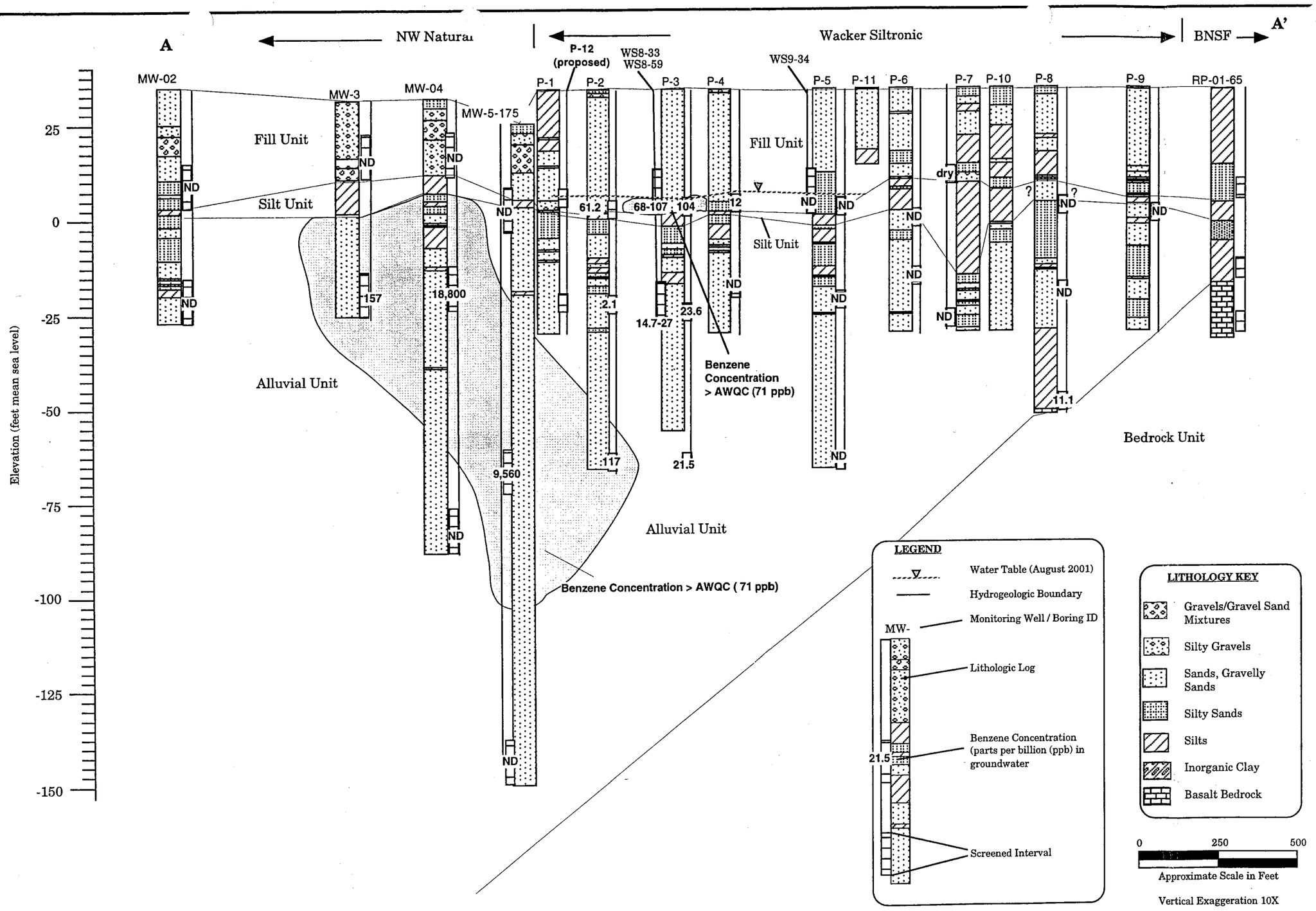


**Figure 2**

**Hydrogeologic Cross Section A - A'**

Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon


HAHN AND ASSOCIATES, INC.
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(503) 796-0717


**February 2002**

**Project No. 5237**

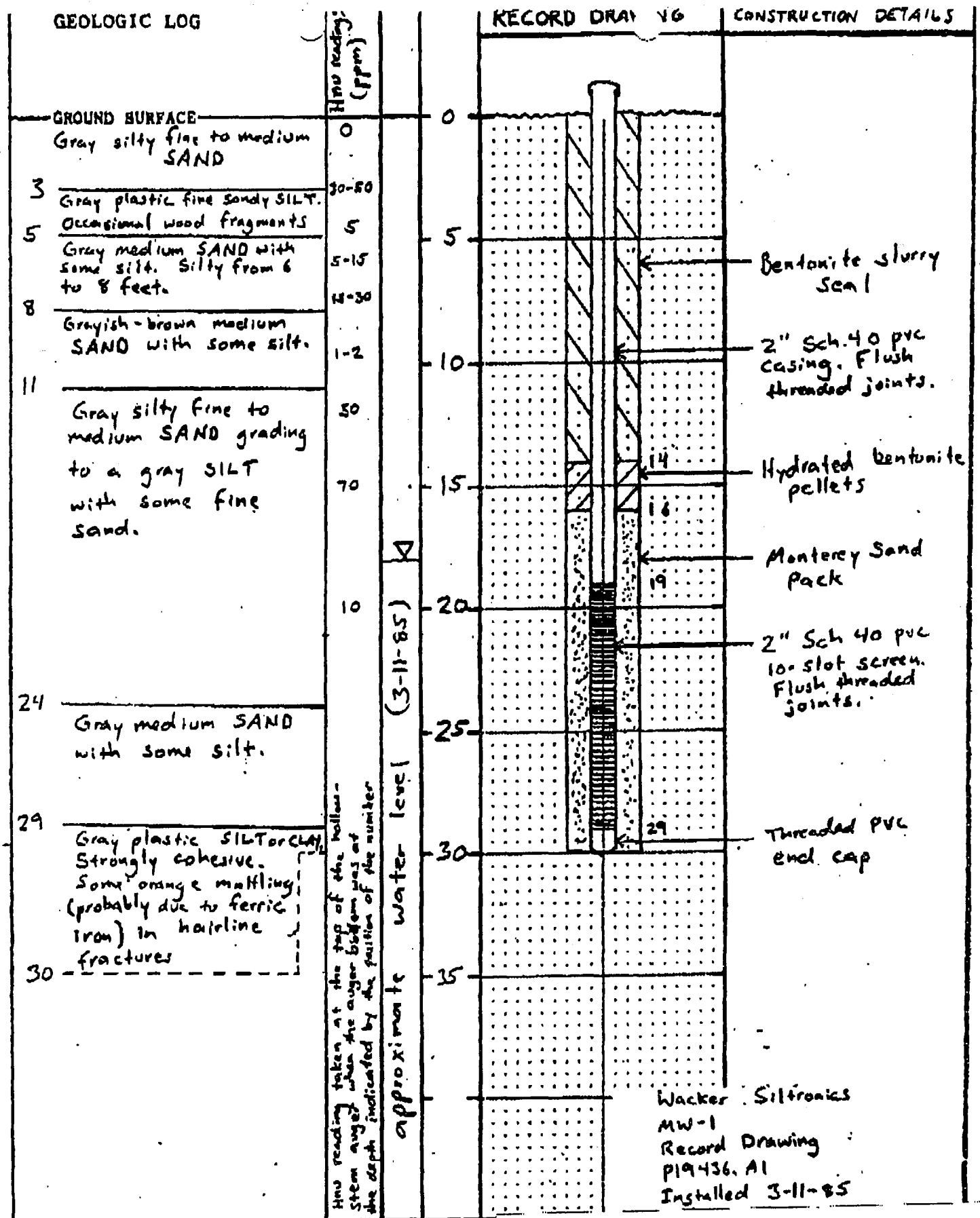
SCOEPA00010601

**ATTACHMENT B**

**Boring Log:**
**Wacker Siltronic Corporation**
**Well MW-1 (WS10-30)**



SCOEPA00010602




To: S. Payne/PDX
from: K. Shimp/SEA

| Post-it® Fax Note 7671 | Date 3/6/02 | # of pages ▶ 1 |
|---|---|---|
| To Rob Eole | From Myron Burr | |
| Co./Dept. Hahn | Co. Wacker Siltronic | |
| Phone # | Phone # 503-219-7832 | |
| Fax # | Fax # | |

March 7, 2002

Mr. Eric Blischke
Project Manager
Voluntary Cleanup and Portland Harbor Section
Oregon Department of Environmental Quality
Northwest Region
2020 SW Fourth Avenue, Suite 400
Portland, Oregon 97201-4987

RE: Workplan for Supplmental Remedial Investigation at Wacker Siltronic Corporation Property, Portland, Oregon.

Dear Mr. Blischke:

In your January 7, 2002, letter to Mr. Bob Wyatt of Northwest Natural regarding the *Data Package for Focused Remedial Investigation* submitted by Hahn and Associates (Hahn) on November 20, 2001, you requested an investigation of the 1984 TCE spill area on the Wacker Siltronic Corporation property (Wacker Siltronic). This letter presents a workplan for that investigation, to be conducted by Limno-Tech, Inc (LTI) on behalf of Wacker Siltronic. It is our understanding that the other items identified in your letter to Mr. Wyatt will be addressed by Northwest Natural and their consultant.

This workplan summarizes the objective, rationale, methodology, and deliverables associated with the planned work. To facilitate your review of this workplan, LTI intends to follow the methods and procedures described in the *Final Focused Remedial Investigation Sampling & Analysis Plan* (SAP) previously prepared by Hahn for the Wacker Siltronic remedial investigation with the exceptions noted below.

***Objective***

The objective of the remedial investigation activities described in this workplan is to collect data to determine whether unacceptable environmental impacts remain in soil or groundwater from the 1984 TCE spill at Wacker Siltronic. Therefore, the investigation will consist of soil and groundwater sampling at and near the 1984 TCE spill location, with analysis for TCE and its daughter compounds (1,1-dichloroethylene, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene and vinyl chloride). In addition, at the March 1, 2001 meeting at the Oregon Department of Environmental Quality (ODEQ) Northwest Regional Offices to discuss the responses to your January 7, 2002 letter to Bob Wyatt of NW Natural, you requested that parameters be analyzed to evaluate the presence of petroleum substances related to the former GASCO site investigations. To expedite

this request, samples will also be analyzed for the main petroleum indicator compounds including benzene, toluene, ethylbenzene and xylenes (BTEX) and polynuclear aromatic hydrocarbons (PAHs), but none of the other compounds that are noted in the Hahn SAP (semivolatile organics, metals, cyanide, chloride and total organic carbon). The petroleum indicator compound data will be used by NW Natural to supplement their currently ongoing Focused Remedial Investigation. The scope of the investigation to accomplish this supplemental remedial investigation is described below.

***Sampling Scope and Rationale***

The investigation of the 1984 TCE release area involves soil and groundwater sampling at the three locations depicted on the attached map, which are labeled GP02-01, GP02-02, and GP02-03. Soil and groundwater samples will be collected at these locations and analyzed for TCE and its daughter products and the petroleum indicator compounds. These locations were selected to address specific questions about the 1984 TCE release:

- GP02-01: This is the approximate location of the 1984 TCE release. Immediately after the release occurred, soil was excavated for off-site disposal to remediate local soil impacts from the release. Confirmatory sampling indicated residual TCE concentrations in soil of less than 1 mg/kg. If sampling at this location does not reveal residual impacts of the TCE spill in soil and groundwater, it will be concluded that the soil removal action conducted immediately following the release was successful in preventing TCE and its daughter products from reaching groundwater at this location.

- GP02-02: This location coincides with the approximate location of a historical surface drainage way. If the historical drainage way is at this location, it should be possible to identify it through standard visual/manual soil characterization techniques in the field. If sampling at this location does not reveal detectable concentrations of TCE or its daughter products in soil and groundwater, it will be concluded that the TCE released in 1984 did not reach this location and no further investigation in this area will be planned.

- GP02-03: GP02-03 is located in the approximate location of the drainage way and between the historic TCE spill location and the river. If TCE and its daughter products are not detected in soil at this location, it will be concluded that the historical drainage way did not act as a preferential pathway for the migration of these chemicals; and that the 1984 TCE release did not cause the chlorinated VOC impacts detected in groundwater along the riverbank, especially at sampling locations P-2 and P-3. It will further be concluded that the 1984 TCE release did not contribute to contamination of sediments in Portland Harbor.

If detectable concentrations of TCE or its daughter products are encountered in soil and/or groundwater at any of these locations, the data will be evaluated to determine the need for additional investigation or remediation. If necessary or appropriate, additional investigations will be planned to investigate whether the measured impacts are a result of the 1984 TCE release or from migration from other sources. If the need for additional

sampling is supported by the data collected during the planned investigation, a supplemental plan will be submitted to ODEQ for review.

***Sampling Methodology***

At each of the proposed sampling locations, a hydraulic push-probe (e.g., Geoprobe®) boring will be advanced for subsurface lithological characterization and sampling. Soil will be sampled using a four foot long core sampling device to allow continuous characterization of soil from ground surface downward until saturated conditions are encountered (expected to be approximately 28 ft. bgs). Continuous coring for subsurface lithological characterization will be continued in the saturated zone to an approximate depth of 60 feet below surface grade, if site conditions permit. Below this, characterization will be performed every 10 feet (e.g., one four foot long core will be collected in every 10 foot depth interval) to a total attempted depth of 100 ft. bgs.

All soil cores will be screened with a portable photoionization detector (PID). The additional screening techniques (olfactory, sheen, ultraviolet fluorescence, and dye methods) listed in the SAP will not be conducted. Up to three soil samples will be collected for laboratory analysis as follows: at each location, soil samples will be collected at three feet below grade and just above the depth at which saturation occurs. A soil sample will also be collected from the depth interval at which the PID yields the highest response. If the highest PID response occurs at three feet below grade or just above the depth at which saturation occurs (pre-specified sampling depths), the location of the third sample will be determined by the judgment of the field supervisor. These soil samples will be analyzed for TCE or its daughter products using USEPA SW-846 Method 8260b, in accordance with the Sampling and Analysis Plan (SAP). In addition, the soil samples will be analyzed for petroleum indicator compounds using USEPA SW-846 Method 8260b for BTEX and USEPA SW-846 Method 8270 for PAHs.

Groundwater will also be sampled at each of the proposed sampling locations to evaluate groundwater impacts from the 1984 TCE release. Groundwater will be sampled at depths of 28-32 feet below ground surface (ft. bgs), 56-60 ft. bgs, and 96-100 ft. bgs. Groundwater samples will be collected from the proposed sampling locations using methods described in the SAP and analyzed for volatile organic compounds using USEPA SW-846 Method 8260b. In addition, the groundwater samples will be analyzed for petroleum indicator compounds using USEPA SW-846 Method 8260b for BTEX and USEPA SW-846 Method 8270 for PAHs.

If unforeseen conditions require relocation of borings, or if other changes to the scope of work outlined herein are required because of field conditions, those changes and the reason for them will be described in a report to be completed following implementation of this workplan. Such changes may be necessitated by the presence of underground utilities or other structures.

The methodologies to be used for implementation of the work described herein are described in the SAP prepared by Hahn for previous investigations on GASCO and Wacker Siltronic, which is attached. If circumstances require deviation from the sampling

and analytical procedures outlined in the SAP, the variances will be reported with the data. All site investigation activities described in this workplan will be conducted under the supervision of an Oregon Registered Geologist or other qualified and experienced environmental professional.

***Quality Assurance***

For expediency, we will follow the quality assurance procedures described in the (SAP) prepared by Hahn for previous investigations on the Wacker Siltronic site. If circumstances require deviation from the quality assurance procedures outlined in the SAP, the variances will be reported with the data.

***Health and Safety***

Procedures and measures to protect worker health and safety are described in the attached site-specific Health and Safety Plan (HASP) prepared by LTI.

***Deliverables***

Upon completion of all tasks described in this plan, a report will be prepared and submitted for review by your agency. The report will include:

- A description of the activities conducted under this scope of work;
- Maps showing sampling locations and presenting the data collected;
- Copies of all data reports and boring construction logs;
- A written summary and interpretation of the data collected.

If review of the data collected during this investigation indicates the need for additional data collection, a supplemental investigation workplan will be submitted to ODEQ for review.

***Schedule***

LTI, on behalf of Wacker Siltronic, proposes to conduct the investigation activities described herein during the same time frame as the supplemental investigation activities that will be conducted by Northwest Natural.

If you have any questions about this workplan or need additional information, please call me at 503-248-1768.

Sincerely,

Kathi Futornick

Northwest Regional Manager
Limno-Tech, Inc.

Attachments

CC: Cathryn Young

## Young, Cathryn

**From:** Kathi Futornick [kfutornick@limno.com]
**Sent:** Wednesday, March 06, 2002 3:54 PM
**To:** Cathryn Young (E-mail)
**Subject:** Revised Workplan and Cost Estimate

cost_estimate_3-7-02_kf.xls

Draft_Workplan_3-7-02.doc

Additional Lab Costs.xls

Cost_estimate_memo_3-6-02.doc

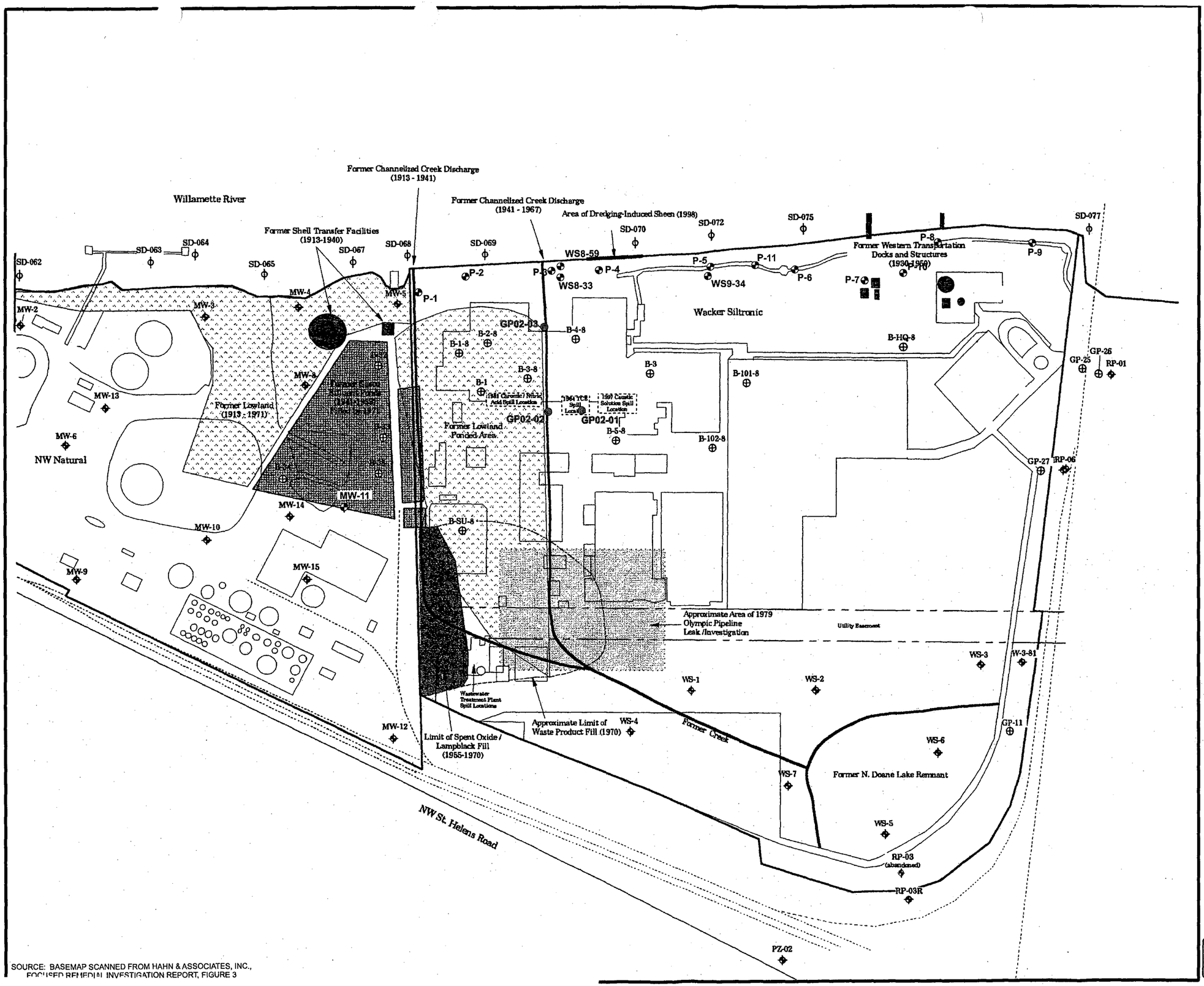
Cathryn -

The revisions to the cost estimate resulted in about a $5,000 savings. The total estimate now is $30,437. Also attached is a summary of the additional lab costs (about $6,000). The workplan is revised as well and I can finalize this if all the changes are acceptable, and forward it to Eric today.

Kathi Futornick
Northwest Regional Manager
Limno-Tech, Inc.
4640 SW Macadam Avenue, Suite 60
Portland, Oregon 97201
Phone: (503) 248-1768
Fax: (503) 248-1959
Email: kfutornick@limno.com
Web: www.limno.com



SCOEPA00010609




SOURCE: BASEMAP SCANNED FROM HAHN & ASSOCIATES, INC., FOCUSED REMEDIAL INVESTIGATION REPORT, FIGURE 3

# PROPOSED SOIL AND GROUNDWATER SAMPLING LOCATIONS


**LTI Environmental Engineering**
A Division of Limno-Tech, Inc.
501 Avis Drive, Ann Arbor, MI 48108

**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL CONSULTANTS

February 15, 2002

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland OR 97201-4987

HAI Project No. 5237

SUBJECT: Supplemental Work Plan, Focused Remedial Investigation (RI) Activities; Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. Blischke:

As described within the approved *Final Focused Remedial Investigation (RI) Work Plan*[1] (Work Plan) prepared for the Wacker Siltronic Corporation property, at the completion of proposed monitoring well installation activities, NW Natural is to provide the Oregon Department of Environmental Quality (ODEQ) with a supplemental plan for completing groundwater quality and elevation monitoring activities at the site (Figure 1). As indicated in the Work Plan, the supplemental plan contained herein describes proposed water quality and water level monitoring activities to be completed during the balance of the one-year quarterly monitoring period. As such, the supplemental plan includes a description of the proposed water quality monitoring program, as well as a plan for conducting water level measurements, during the remaining two quarterly sampling events scheduled for the site (i.e., March and June, 2002). Finally the supplemental plan provides details regarding completion of the continuous short-term (minimum 48-hour) groundwater elevation monitoring event that was identified in the Work Plan. Details regarding the completion of the preceding activities are provided below.

## 1.0 Routine Water Level Monitoring

Water levels in select monitoring wells at the Wacker site and in the site vicinity (Table 1) will be measured during the remaining two quarterly monitoring events at Wacker to monitor seasonal fluctuations in groundwater elevations. Further, river stage data will be collected from an established benchmark located at the NW Natural – Gasco site, located immediately downstream of the Wacker property. The preceding will provide for a determination of groundwater flow direction, hydraulic gradient, and an indication of hydraulic continuity between groundwater and the Willamette River. All water levels will be collected quarterly in conjunction with the two remaining quarterly groundwater monitoring activities. Access to pre-RI Wacker Siltronic and Rhone Poulenc wells was not granted for the first two quarterly events.

[1] Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1, 2001.

The static water levels in the monitoring wells will be measured using a Solinst water level indicator (conductive probe). The water levels will be measured from the north side of the top of the casing. Monitoring wells proposed for inclusion within the quarterly water level monitoring activities are identified on Table 1 and are shown on Figure 1.

## 2.0 Short-Term Continuous Water Level Monitoring Test

A 14-day continuous water level monitoring test will take place at select monitoring wells to determine if tidal and river stage fluctuations in the Willamette River influence groundwater flow direction and hydraulic gradients across the Wacker property. Water levels will be collected electronically on a continuous basis (i.e., every 15 minutes) using pressure transducers / data loggers placed within selected individual wells. Water levels will also be simultaneously recorded in the river to compare to the groundwater levels. River level measurement will be collected at the established monitoring station immediately down-river of Wacker at the NW Natural Gasco facility. In addition to the preceding, site-specific rainfall data will be collected during the course of the test from an existing weather station located on the adjacent NW Natural Gasco property. Sampling points to be included within the short-term continuous water level monitoring test are identified below, and are depicted on Figure 1.

| Monitoring Point | Water-Bearing Zone |
|---|---|
| WS-3-27 | Surficial Fill |
| WS-3-81 | Alluvial |
| WS-5-20 | Surficial Fill |
| WS-8-33 | Surficial Fill |
| WS-8-59 | Alluvial |
| MW-10-61 (Gasco) | Alluvial |
| Willamette River (Gasco) | - |

## 3.0 Quarterly Groundwater Monitoring

As provided within the approved Work Plan, monitoring wells installed as part of the recent RI activities at the Wacker property (wells WS-8-33, WS-8-59, and WS-9-34), are to be sampled quarterly for one year. To date, two of the required four quarterly sampling events have been completed (October and December 2001), with groundwater samples being analyzed for the full suite of contaminants of potential concern (COPCs) as identified within the approved Work Plan. Groundwater samples collected during the remaining two sampling events (March and June, 2002) are currently anticipated to be analyzed for the full suite of COPCs. The specific groundwater monitoring plan is defined on Table 1. Modifications to this monitoring plan may be proposed in the future based on information provided within ODEQ correspondence dated February 6, 2002 (Blischke to Wyatt).

If you have any questions regarding this proposal, please do not hesitate to contact me at 503-796-0717.

Sincerely,

Robert Ede, R.G.
Associate

rede@hahnasoc.com

c: Mr. Bob Wyatt, NW Natural
Ms. Patty Dost, Schwabe, Williamson & Wyatt
Mr. Carl Stivers, Anchor Environmental, LLC
Ms. Cathryn Young, Wacker Siltronic Corporation

Willamette River

Former Channelized Creek Discharge (1913 - 1941)

Former Channelized Creek Discharge (1941 - 1967)

Area of Dredging-Induced Sheen (1998)

Former Western Transportation Docks and Structures (1930-1950)

Former Shell Transfer Facilities (1913-1940)

SD-062 SD-063 SD-064 SD-065 SD-067 SD-068 SD-069 SD-070 SD-072 SD-075 SD-077

P-1 P-2 P-3 P-4 P-5 P-6 P-7 P-8 P-9 P-10 P-11

WS8-59 WS8-33 WS9-34

MW-2 MW-3 MW-4 MW-5 MW-6 MW-8 MW-9 MW-10 MW-11 MW-12 MW-13 MW-14 MW-15

B-1-8 B-2-8 B-3-8 B-4-8 B-5-8 B-HQ-8 B-1 B-3 B-32 B-33 B-34 B-35 B-SU-8 B-101-8 B-102-8

GP-25 GP-26 RP-01 GP-27 RP-06 GP-11

NW Natural

Former Lowland (1913 - 1971)

Former Gasco Effluent Ponds (1941-1955) Filled by 1971

Former Lowland Ponded Area

1981 Chromic / Nitric Acid Spill Location

1984 TCE Spill Location

1997 Caustic Solution Spill Location

Wacker Siltronic

Approximate Area of 1979 Olympic Pipeline Leak /Investigation

Utility Easement

Limit of Spent Oxide / Lampblack Fill (1955-1970)

Wastewater Treatment Plant Spill Locations

Approximate Limit of Waste Product Fill (1970)

Former Creek

Former N. Doane Lake Remnant

WS-1 WS-2 WS-3 WS-4 WS-5 WS-6 WS-7 W-3-81

RP-03 (abandoned)

RP-03R

PZ-02

NW St. Helens Road

N

LEGEND

- Site Boundary
- Existing Structure or Feature
- Railroad Tracks
- Existing Monitoring Well Location
- EPA Sediment Sampe Location
- Select Boring Location (pre-2001)
- Push Probe Boring Location (HAI, 2001)
- Combined Stormwater / Process Effluent Sewer Line
- Stormwater Sewer Line
- Abandoned Utility Line
- Fire Water Line
- Olympic Petroleum Lines (2-14-inch)
- Natural Gas Line (16-inch/10-inch)

Note: Locations are approximate: Survey of 2001 sample locations not finalized

0 250 500

Approximate Scale in Feet

**Figure 1**

**Monitoring Well and Push Probe Location Map**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

**HAHN & ASSOCIATES, INC.**
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717

**October 2001**

**Project No. 5237**

SCOEPA00010614

**TABLE 1**
**Proposed Groundwater Monitoring Sampling and Analysis Summary for Monitoring Wells (January 2002)**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Well Number | Well Location | Water-Bearing Zone (WBZ) | Sampling Event | | | | Analytical Methods | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Year 2001 | | Year 2002 | | PAHs | SVOCs | VOCs | Total Cyanide | Amenable Cyanide | Total Metals | Groundwater Elevation |
| | | | September | December | March | June | EPA Method 8270 SIM | EPA Method 8270 | EPA Method 8260 | EPA Method 9010 | EPA Method 9010 | EPA Method 6010 | Field Measurement |
| WS-1-22[2] | Former N. Doane Lake Remnant / Creek Area | Surficial Fill | | | X | X | | | | | | | X |
| WS-2-22[2] | Former N. Doane Lake Remnant / Creek Area | Surficial Fill | | | X | X | | | | | | | X |
| WS-3-27[2] | Former N. Doane Lake Remnant / Creek Area | Surficial Fill | | | X | X | | | | | | | X |
| WS-3-81[2] | Former N. Doane Lake Remnant / Creek Area | Alluvial Sand | | | X | X | | | | | | | X |
| WS-4-20[2] | Former N. Doane Lake Remnant / Creek Area | Surficial Fill | | | X | X | | | | | | | X |
| WS-5-20[2] | Former N. Doane Lake Remnant / Creek Area | Surficial Fill | | | X | X | | | | | | | X |
| WS-6-24[2] | Former N. Doane Lake Remnant / Creek Area | Surficial Fill | | | X | X | | | | | | | X |
| WS-7-25[3] | Former N. Doane Lake Remnant / Creek Area | Surficial Fill[3] | | | | | | | | | | | |
| WS-8-33 | Riverfront | Surficial Fill | X | X | X | X | X | X | X | X | X | X | X |
| WS-8-59 | Riverfront | Alluvial Sand | X | X | X | X | X | X | X | X | X | X | X |
| WS-9-34 | Riverfront | Surficial Fill | X | X | X | X | X | X | X | X | X | X | X |
| RP-1-31[1] | Adjacent BNSF Property | Surficial Fill | | | X | X | | | | | | | X |
| RP-1-55[1] | Adjacent BNSF Property | Alluvial Sand | | | X | X | | | | | | | X |
| RP-1-65[1] | Adjacent BNSF Property | Alluvial Sand | | | X | X | | | | | | | X |
| RP-3-30R[1] | Adjacent BNSF Property | Surficial Fill | | | X | X | | | | | | | X |
| RP-3-52R[1] | Adjacent BNSF Property | Alluvial Sand | | | X | X | | | | | | | X |
| RP-6-31[1] | Adjacent BNSF Property | Surficial Fill | | | X | X | | | | | | | X |
| RP-6-87[1] | Adjacent BNSF Property | Alluvial Sand | | | X | X | | | | | | | X |
| QA/QC | Trip Blank(1 per day of sampling) | - | X | X | X | X | | | X | | | | |
| QA/QC | Equipment Blank | - | X | X | X | X | X | X | X | X | X | X | |
| QA/QC | Field Duplicate | - | X | X | X | X | X | X | X | X | X | X | |
| QA/QC | Matrix Spike/Matrix Spike Duplicate | - | | | X | | X | X | X | X | X | X | |

NOTE: BTEX = benzene, toluene, ethylbenzene, and xylenes
PAHs = polynuclear aromatic hydrocarbons
EPA = Environmental Protection Agency
PAHs = polynuclear aromatic hydrocarbons
SVOCs = semivolatile organic compounds
VOCs = volatile organic compounds
1 = assumes receipt of property access from Rhone Poulenc, Inc. and the Burlington Northern Santa Fe (BNSF) Railway
2 = assumes wells are present, accessible, and in suitable condition
3 = the design for this well suggests that screen interval may be hybridized between both Surficial Fill and Alluvial Sand WBZs
Metals = antimony, arsenic, barium, cadmium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, selenium, silver, titanium, vanadium, zinc

February 12, 2002

Mr. Eric Blischke
Project Manager
Voluntary Cleanup and Portland Harbor Section
Oregon Department of Environmental Quality
Northwest Region
2020 SW Fourth Avenue, Suite 400
Portland, Oregon 97201-4987

RE: Workplan for Supplemental Investigation at Wacker Siltronic Corporation Property, Portland, Oregon.

Dear Mr. Blischke:

In your January 7, 2002, letter to Mr. Bob Wyatt of Northwest Natural regarding the recently submitted *Data Package for Focused Remedial Investigation* submitted by Hahn and Associates (Hahn) on November 20, 2001, you indicated that you wanted an investigation of the area of the reported 1984 TCE spill on the Wacker Siltronic Corporation property (Wacker). This letter presents a workplan for that investigation, to be conducted by Limno-Tech, Inc. (LTI) on behalf of Wacker. It is our understanding that other items identified in your letter to Mr. Wyatt will be addressed by Northwest Natural and their consultant.

This workplan summarizes the objective, rationale, methodology, and deliverables associated with the planned work. To facilitate your review of this workplan, LTI intends to follow the methods and procedures described in the Quality Assurance Project Plan (QAPP) and Sampling & Analysis Plan (SAP) previously prepared by Hahn for the GASCO site adjacent to Wacker, with the exceptions noted below.

***Objective***

The objective of the investigation activities described in this workplan is to collect data to determine whether unacceptable environmental impacts remain in soil or groundwater from the 1984 TCE spill at Wacker. Therefore, the investigation will consist of soil and groundwater sampling at and near the 1984 TCE spill location, with analysis for TCE and its daughter compounds. The scope of the investigation to accomplish this objective as described below.

*Sampling Scope and Rationale*

The investigation of the 1984 TCE release area involves soil and groundwater sampling at the three locations depicted on the attached map, which are labeled GP02-01, GP02-02, and GP02-03. Soil and groundwater samples will be collected at these locations and analyzed for TCE and its daughter products. These locations were selected to address specific questions about the 1984 TCE release:

- GP02-01: This is the approximate location of the 1984 TCE release. Immediately after the release occurred, soil was excavated for off-site disposal to remediate local soil impacts from the release. Confirmatory sampling indicated residual TCE concentrations in soil of less than 1 mg/kg. If sampling at this location does not reveal residual impacts of the TCE spill in soil and groundwater, it will be concluded that the soil removal action conducted immediately following the release was successful in preventing TCE and its daughter products from reaching groundwater at this location.

- GP02-02: This location coincides with the approximate location of a historical surface drainage way. If released TCE did reach this location and penetrate the ground in sufficient quantity, the historical drainage way may have acted as a preferential pathway. If the historical drainage way is at this location, it should be possible to identify it through standard visual/manual soil characterization techniques in the field. If sampling at this location does not reveal detectable concentrations of TCE or its daughter products in soil and groundwater, it will be concluded that the TCE released in 1984 did not reach this location and no further investigation in this area will be planned.

- GP02-03: If TCE released in 1984 did reach the historical drainage way discussed above, it may have followed the drainage way toward the river. GP02-03 is located in the approximate location of the drainage way and between the TCE spill location and the river. If the 1984 TCE release resulted in migration of TCE via preferential pathways or with natural groundwater flow, it should be detectable at this location. If TCE and its daughter products are not detected in soil at this location, it will be concluded that the historical drainage way did not act as a preferential pathway for the migration of these chemicals. If TCE and its daughter products are not detected in groundwater at this location, it will be concluded that the 1984 TCE release did not cause the chlorinated VOC impacts detected in groundwater along the riverbank, especially at sampling locations P-2 and P-3. It will further be concluded that the 1984 TCE release did not contribute to contamination of sediments in Portland Harbor.

If detectable concentrations of TCE or its daughter products are encountered in soil and/or groundwater at any of these locations, the data will be evaluated to determine the need for additional investigation or remediation. If necessary or appropriate, additional investigations will be planned to investigate whether the measured impacts are a result of the 1984 TCE release or from migration from other sources. If the need for additional



SCOEPA00010617

sampling is supported by the data collected during the planned investigation, a supplemental plan will be submitted to ODEQ for review.

***Sampling Methodology***

At each of the proposed sampling locations, a hydraulic push-probe (e.g., Geoprobe®) boring will be advanced for subsurface characterization and sampling. Soil will be sampled using a core sampling device to allow continuous characterization of soil from ground surface downward until saturated conditions are encountered (expected to be approximately 28 ft. bgs).

All soil cores will be screened with a portable photoionization detector (PID). Up to three soil samples will be collected for laboratory analysis as follows: at each location, soil samples will be collected at three feet below grade and just above the depth at which saturation occurs. In addition, a soil sample will be collected from the depth interval at which the PID yields the highest response. If the highest PID response occurs at three feet below grade or just above the depth at which saturation occurs (pre-specified sampling depths), the location of the third sample will be determined by the judgment of the field supervisor. These soil samples will be analyzed for volatile organic compounds using USEPA SW-846 Method 8260b, in accordance with the Sampling and Analysis Plan (SAP).

Groundwater will also be sampled at each of the proposed sampling locations to evaluate groundwater impacts from the 1984 TCE release. Soil and groundwater sampling will be collocated, if possible. If collocation is not possible, the push probe borings to collect soil and groundwater samples will be located within 3 feet of one another. At each groundwater sampling location, groundwater will be sampled at depths of 28-32 feet below ground surface (ft. bgs), 56-60 ft. bgs, and 96-100 ft. bgs. A total of nine groundwater samples will be collected from the proposed sampling locations using methods described in the SAP and analyzed for volatile organic compounds using USEPA SW-846 Method 8260b.

If unforeseen conditions require relocation of borings, or if other changes to the scope of work outlined herein are required because of field conditions, those changes and the reason for them will be described in a report to be completed following implementation of this work. Such changes may be necessitated by the presence of underground utilities or other structures.

The methodologies to be used for implementation of the work described herein are described in the SAP prepared by Hahn for previous investigations on GASCO and Wacker, which is attached. If circumstances require deviation from the sampling and analytical procedures outlined in the SAP, the variances will be reported with the data. All site investigation activities described in this workplan will be conducted under the supervision of a Certified Professional Geologist or other qualified and experienced environmental professional.



SCOEPA00010618

***Quality Assurance***

For expediency, we will follow the quality assurance procedures described in the Quality Assurance Project Plan (QAPP) prepared by Hahn for previous investigations on GASCO and Wacker, which is attached. If circumstances require deviation from the quality assurance procedures outlined in the QAPP, the variances will be reported with the data.

***Health and Safety***

Procedures and measures to protect worker health and safety are described in a site-specific Health and Safety Plan (HASP) prepared by LTI.

***Deliverables***

Upon completion of all tasks described in this plan, a report will be prepared and submitted for review by your agency. The report will include:

- A description of the activities conducted under this scope of work;
- Maps showing sampling locations and presenting the data collected;
- Copies of all data reports and boring logs;
- A written summary and interpretation of the data collected.

If review of the data collected during this investigation indicates the need for additional data collection, a supplemental investigation workplan will be submitted to ODEQ for review.

***Schedule***

LTI, on behalf of Wacker, proposes to conduct the investigation activities described herein during the same time frame as the supplemental investigation activities that will be conducted by Northwest Natural.

If you have any questions about this workplan or need additional information, please call me at 503-248-1768.

Sincerely,

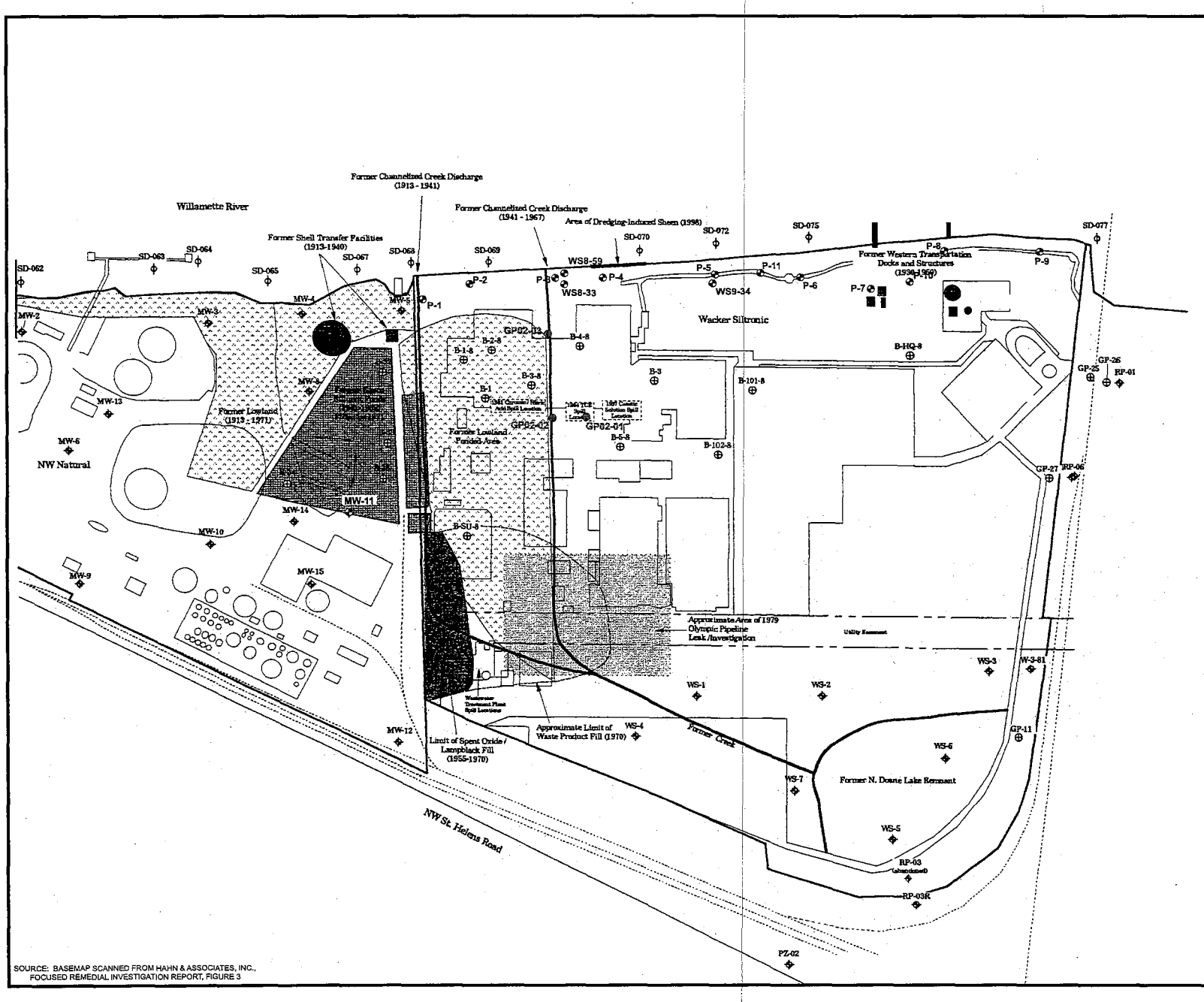
Kathi Futornick

Attachments

CC: Cathryn Young



SCOEPA00010619




SOURCE: BASEMAP SCANNED FROM HAHN & ASSOCIATES, INC., FOCUSED REMEDIAL INVESTIGATION REPORT, FIGURE 3

# PROPOSED SOIL AND GROUNDWATER SAMPLING LOCATIONS

LTI Environmental Engineering
A Division of Limno-Tech, Inc.
501 Avis Drive, Ann Arbor, MI 48108

SCOEPA00010620

February 6, 2002

Mr. Eric Blischke
Project Manager
Voluntary Cleanup and Portland Harbor Section
Oregon Department of Environmental Quality
Northwest Region
2020 SW Fourth Avenue, Suite 400
Portland, Oregon 97201-4987

RE: Workplan for Supplemental Remedial Investigations at Wacker Siltronic Corporation Property, Portland, Oregon.

Dear Mr. Blischke:

In your January 7, 2002, letter to Mr. Bob Wyatt of Northwest Natural regarding the recently submitted *Data Package for Focused Remedial Investigation* submitted by Hahn and Associates (Hahn) on November 20, 2001, you indicated that you wanted an investigation of the area of the reported 1984 TCE spill on the Wacker Siltronic Corporation property (Wacker). This letter presents a workplan for that investigation, to be conducted by Wacker Siltronic. It is our understanding that other items identified in your letter to Mr. Wyatt will be addressed by Northwest Natural and their consultant.

This workplan summarizes the objective, rationale, methodology, and deliverables associated with the planned work. To facilitate your review of this workplan, we intend to follow the methods and procedures described in the Quality Assurance Project Plan (QAPP) and Sampling & Analysis Plan (SAP) previously prepared by Hahn for the GASCO site adjacent to Wacker, with the exceptions noted below.

***Objective***

The objective of the investigation activities described in this workplan is to collect data to determine whether unacceptable environmental impacts remain in soil or groundwater from the 1984 TCE spill at Wacker. In conducting this work, it is assumed that residual traces of TCE or its daughter products will remain in soil or groundwater if the TCE spill was not fully remediated. Therefore, the investigation will consist of soil and groundwater sampling at and near the 1984 TCE spill location, with analysis for TCE and its daughter compounds. The scope of the investigation to accomplish this objective as described below.

***Sampling Scope and Rationale***

The planned investigation of the 1984 TCE release area involves soil and groundwater sampling at the three locations depicted on the attached map, which are labeled GP02-01, GP02-02, and GP02-03. Soil and groundwater samples will be collected at these locations and analyzed for TCE and its daughter products. These locations were selected to address specific questions about the 1984 TCE release:

- GP02-01: This is the approximate location of the 1984 TCE release. Immediately after the release occurred, soil was excavated for off-site disposal to remediate local soil impacts from the release. Confirmatory sampling indicated residual TCE concentrations in soil of less than 1 mg/kg, ~~however, some residual TCE might have leached down~~ through the soil column and may possibly have reached ~~groundwater. GP02-01 will be conducted to investigate this possibility~~. If sampling at this location does not reveal residual impacts of the TCE spill in soil and groundwater, it will be concluded that the soil removal action conducted immediately following the release was successful in preventing TCE and its daughter products from reaching groundwater at this location.

- GP02-02: It ~~appears that some of the TCE released in 1984~~ may have flowed over a ~~paved sidewalk~~ onto ground that was not excavated. TCE may, in turn, have ~~leached down~~ through the soil column and may possibly have reached groundwater. GP02-02 will be conducted to investigate ~~this~~ possibility. This location ~~also~~ coincides with the approximate location of a historical surface drainage way. If released TCE did flow overland to this location and penetrate the ground in sufficient quantity, the historical drainage way may have acted as a preferential pathway and ~~may have reached the river by this~~ pathway. If the historical drainage way is at this location, it should be possible to identify it through standard visual/manual soil characterization techniques in the field. If sampling at this location does not reveal detectable concentrations of TCE or its daughter products in soil and groundwater, it will be concluded that the TCE released in 1984 did not reach this location and no further investigations in this area will be planned.

- GP02-03: If TCE released in 1984 did reach the historical drainage way discussed above, it may have followed the drainage way to the river. GP02-03 is located in the approximate location of the drainage way and between the TCE spill location and the river. If the 1984 TCE release resulted in migration of TCE via preferential pathways or with natural groundwater flow ~~to the river~~, it should be detectable at this location. If TCE and its daughter products are not detected in soil at this location, it will be concluded that the historical drainage way did not act as a preferential pathway for the migration of these chemicals ~~to the river~~. If TCE and it daughter products are not detected in groundwater at this location, it will be concluded that the 1984 TCE release did not cause the chlorinated VOC impacts detected in groundwater along the riverbank, especially at sampling locations P-2 and P-3. It will further be concluded that the 1984 TCE release did not contribute to contamination of sediments in Portland Harbor.

If detectable concentrations of TCE or its daughter products are encountered in soil and/or groundwater at any of these locations, the data will be evaluated to determine the need for additional investigation or remediation. If necessary or appropriate, additional investigations will be planned to investigate whether the measured impacts are a result of the 1984 TCE release or from migration from other sources. If the need for additional sampling is supported by the data collected during the planned investigation, a supplemental plan will be submitted to ODEQ for review.

***Sampling Methodology***

At each of the proposed sampling locations, Wacker will conduct a Geoprobe boring for subsurface characterization and sampling. Soil will be sampled using a core sampling device to allow continuous characterization of soil from ground surface downward until saturated conditions are encountered (expected to be approximately 28 ft. bgs).

All soil cores will be screened with a portable photoionization detector (PID). Up to three soil samples will be collected for laboratory analysis as follows: at each location, soil samples will be collected at three feet below grade and just above the depth at which saturation occurs. In addition, a soil sample will be collected from the depth interval at which the PID yields the highest response. If the highest PID response occurs at three feet below grade or just above the depth at which saturation occurs (pre-specified sampling depths), the location of the third sample will be determined by the judgment of the field supervisor. These soil samples will be analyzed for volatile organic compounds using USEPA SW-846 Method 8260b, in accordance with the Sampling and Analysis Plan (SAP). Groundwater will also be sampled at these locations to evaluate groundwater impacts from the 1984 TCE release. Soil and groundwater sampling will be collocated, if possible. If collocation is not possible, the Geoprobe borings to collect soil and groundwater samples will be located within 3 feet of each other at GP02-05 and GP02-06. At each groundwater sampling location, groundwater will be sampled at depths of 28-32 feet below ground surface ( ft. bgs), 56-60 ft. bgs, and 96-100 ft. bgs. A total of 6 groundwater samples will be collected from these two locations using methods described in the SAP and analyzed for volatile organic compounds using USEPA SW-846 Method 8260b.

If unforeseen conditions require relocation of borings or ~~monitoring wells~~, or if other changes to the scope of work outlined herein are required because of field conditions, those changes and the reason for them will be described in the report to be completed following implementation of this work. Such changes may be necessitated by the presence of underground utilities or other structures.

The methodologies to be used for implementation of the work described herein are described in the SAP prepared by Hahn for previous investigations on GASCO and Wacker, which is attached. If circumstances require deviation from the sampling and analytical procedures outlined in the SAP, the variances will be reported with the data. All site investigation activities described in this workplan will be conducted under the supervision of a Certified Professional Geologist or other qualified and experienced environmental professional.

***Quality Assurance***

For expediency, we will follow the quality assurance procedures described in the Quality Assurance Project Plan (QAPP) prepared by Hahn for previous investigations on GASCO and Wacker, which is attached. If circumstances require deviation from the quality assurance procedures outlined in the QAPP, the variances will be reported with the data.

***Health and Safety***

Procedures and measures to protect worker health and safety are described in a site-specific Health and Safety Plan (HASP).

***Deliverables***

Upon completion of all tasks described in this plan, a *Remedial Investigation Report* will be prepared and submitted for review by your agency. The *Remedial Investigation Report* will include:

- A description of the activities conducted under this scope of work;
- Maps showing sampling locations and presenting the data collected;
- ~~Copies of all data reports, boring logs, and well construction diagrams;~~
- A written summary and interpretation of the data collected.

If review of the data collected during this investigation indicates the need for additional data collection, a supplemental investigation workplan will be submitted to ODEQ for review.

***Schedule***

We propose to conduct the investigation activities described herein during the same time frame as the supplemental investigation activities that will be conducted by Northwest Natural. ~~This will~~ minimize disruption to the Wacker facility and may afford the opportunity to have the same drilling subcontractor perform the work proposed herein as is performing the work proposed by Northwest Natural. We understand that ODEQ is ~~interested in coordinated planned sampling~~ events at GASCO, ~~Atofina, Rhone-Poulenc and Wacker concurrently and we are willing to work towards that objective~~.

If you have any questions about this workplan or need additional information, please call me at 503-219~~-7406~~. Thank you.

Sincerely,

Cathryn Young
Wacker Siltronic Corporation

Attachments

CC: Kathi Futornick (LTI)

Oregon
John A. Kitzhaber, M.D., Governor

Department of Environmental Quality
Northwest Region
2020 SW Fourth Avenue
Suite 400
Portland, OR 97201-4987
(503) 229-5263 Voice
TTY (503) 229-5471

January 7, 2002

Mr. Bob Wyatt
Northwest Natural
220 NW Second Avenue
Portland, OR 97209

Re: Data Package for Focused Remedial Investigation
Wacker Siltronic Corporation Property

Dear Bob:

The Oregon Department of Environmental Quality (DEQ) has reviewed the Data Package for Focused Remedial Investigation for the Wacker Siltronic Corporation (Wacker) property. This document was submitted on your behalf by Hahn and Associates (Hahn) on November 20, 2001. The data package summarizes remedial investigation information generated at the Wacker property from June through October 2001. DEQ has reviewed the data package to identify additional investigation activities necessary to evaluate potential sources of contamination to the Willamette River. In general, further investigation should include characterization of groundwater contamination at the P-1 and P-2 locations and the identification and characterization of potential source areas on the Wacker property. A summary of DEQ findings is provided below:

- Petroleum related compounds were detected in groundwater collected at the P-2 and P-3 locations at concentrations exceeding ambient water quality criteria. In addition, a soil sample collected from above the silt unit at the P-1 location was found to contain 60,000 mg/kg (6%) of naphthalene. Because groundwater samples were not collected at the P-1 and P-2 locations, further characterization of potential groundwater discharges to the Willamette River at these locations is required. At this time, DEQ does not anticipate the installation of additional monitoring wells at the P-3 location. In addition, the characterization of potential sources of petroleum contamination to develop a thorough understanding of potential contaminant migration pathways is also required. Potential sources include a former excavation area located upgradient of Fab 1, the historic tar pond overflow areas and drainage ditches that discharged near the P-1 and P-3 locations and Olympic pipeline releases.

- Trichloroethene (TCE) and its breakdown products were detected in groundwater collected at the P-2 location at concentrations exceeding ambient water quality criteria. As a result, further characterization of groundwater contamination adjacent to the Willamette River at the P-2 location and the identification of potential source areas is required. Potential source areas include the 1984 TCE spill area and any areas at the Wacker property where TCE was stored or otherwise managed. In addition, additional characterization of groundwater is

necessary at the adjacent GASCO site to delineate the lateral extent of the TCE groundwater contamination and confirm that operations at the former GASCO facility are not a source of the TCE detected in groundwater at the Wacker property.

- Cyanide was detected in groundwater at concentrations exceeding ambient water quality criteria at numerous locations and depths along the Willamette River. Further evaluation of whether this contamination is adversely affecting the Willamette River is required.
- Catch basin sediments exceed sediment screening criteria for zinc and PAHs. Although stormwater data is consistent with data collected under the terms of Wacker's 1200 Z storm water permit, further efforts to identify and control sources of PAH and zinc contamination to the catch basins and stormwater system is required. In addition, a schedule for the removal of sediments from the catch basins should be submitted to DEQ for review to determine whether the removal frequency should be increased.

- Chlorinated benzenes were detected in groundwater at the P-8 location. However, further characterization of this contamination is expected to be performed as part of the Rhone Poulenc investigation.

- It should be noted that surface soils exceed industrial PRGs for polycyclic aromatic hydrocarbons (PAHs) at the S-1 and S-3. In addition, the river bank sample collected adjacent to the Willamette River was found to contain PAHs above sediment screening criteria. Further investigation should be considered to assess the extent of PAH contamination in surface soils and along the river bank on the Wacker property.

In order to further characterize potential sources of groundwater contamination and groundwater discharges to the Willamette River, DEQ recommends the following investigation activities:

- Monitoring well clusters should be installed at the P-1 and P-2 locations. At the P-1 location, the wells should be installed above and below the silt unit. At the P-2 location, two deep monitoring wells should be installed at approximately 100' below ground surface and at a depth sufficient to delineate the vertical extent of groundwater contamination and confirm the absence or presence of free product at the basalt/alluvium interface.

- A GeoProbe investigation should be performed that targets the TCE spill area, Wacker's hazardous material storage area, the historic drainage ditch that discharges at the P-3 location and the tar pond overflow area upgradient of the P-1 location. In addition, DEQ acknowledges the need for the installation of upgradient monitoring wells in the fill and alluvium water bearing zones. As a result, DEQ recommends the installation of a monitoring well cluster near the former excavation area upgradient of FAB-1. This location is near the originally agreed upon upgradient well cluster location.

Once the drainage ditch evaluation is completed in accordance with the Phase I focused remedial investigation work plan, DEQ will consider Phase I complete. Please have a Phase II focused remedial investigation work plan addendum prepared that addresses the above characterization needs. The work plan addendum should be submitted to DEQ within 30 days of the date of this letter. DEQ recommends that the monitoring wells be installed such that they may be sampled during the spring 2002 groundwater sampling event currently scheduled at the GASCO site for March 2002. It is also worth noting that a Spring 2002 groundwater monitoring event is also scheduled for the Rhone Poulenc site. DEQ recommends that spring water level measurements be collected concurrently at the GASCO, Wacker and Rhone Poulenc sites in order to develop a better understanding of groundwater flow direction at the Wacker site.

Please contact me at (503) 229-5648 if you have any questions regarding this matter.

Sincerely,

Eric L. Blischke
Project Manager
Voluntary Cleanup and Portland Harbor Section

cc: Mike Rosen, NWR/DEQ
Kurt Burkholder, DOJ
Rod Struck, NWR/DEQ
Jennifer Peterson NWR/DEQ
Cathryn Young, Wacker Siltronic Corporation

**Wacker Siltronic Corporation**

7200 NW Front Avenue
Portland, Oregon 97210
Phone: (503) 243-2020
Fax: (503) 219-7599 Central Engineering

# FACSIMILE TRANSMITTAL SHEET

**TO:** **Chris Reive**
**Jordan Schrader**

**FROM:** **Cathryn Young**

**FAX No:** **(503) 598-7373**

**DATE:** **January 10, 2002**

**NUMBER OF PAGES (including this page): 4**

**MESSAGE/SPECIAL INSTRUCTIONS:**

Re: Portland Harbor/Northwest Natural

DEQ letter January 7, 2002

**Wacker Siltronic Corporation**

7200 NW Front Avenue
Portland, Oregon 97210
Phone: (503) 243-2020
Fax: (503) 219-7599 Central Engineering

# FACSIMILE TRANSMITTAL SHEET

**TO:** **Kathi Futornick**
**Limno-tech**

**FROM:** **Cathryn Young**

**FAX No:** **(503) 248-1959**

**DATE:** **January 10, 2002**

**NUMBER OF PAGES (including this page): 4**

**MESSAGE/SPECIAL INSTRUCTIONS:**

Re: Portland Harbor/Northwest Natural

DEQ letter January 7, 2002

Oregon
John A. Kitzhaber, M.D., Governor

**Department of Environmental Quality**
Northwest Region
2020 SW Fourth Avenue
Suite 400
Portland, OR 97201-4987
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TTY (503) 229-5471

September 25, 2002

Mr. Bob Wyatt
Northwest Natural
220 NW Second Avenue
Portland, OR 97209

Ms. Cathryn Young
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, OR 97210

Re: Work Plan for Supplemental Investigation to Further Assess Trichloroethene Detections in the Northern Corner of Wacker Siltronic Corporation Site

Dear Bob and Cathryn:

The Oregon Department of Environmental Quality has reviewed the revised Work Plan for Supplemental Investigation to Further Assess Trichloroethene Detections in the Northern Corner of Wacker Siltronic Corporation Site (Work Plan). The revised Work Plan was submitted by Maul Foster Alongi (MFA) on behalf of Wacker Siltronic Corporation and was received by DEQ on September 20, 2002. The revised Work Plan was submitted in response to DEQ's comment letter dated September 6, 2002.

As you are aware, in its May 31, 2002 letter, DEQ determined that further investigation was necessary to identify potential sources of TCE contamination and determine the vertical and lateral extent of TCE contamination at the Wacker site. The May 31, 2002 letter further stated that this work should, at a minimum, include:

- A review of company records (including records associated with facility construction) to identify potential TCE sources;
- Characterization of site stratigraphy using cone penetrometer or other techniques;
- Soil and groundwater sampling in identified source areas;
- Identification and delineation of the potential DNAPL source;
- The installation of monitoring wells in the vicinity of GP-02-02 and the 1984 TCE spill area to delineate the vertical and lateral extent of contamination in the upland portions of the site; and
- The installation of monitoring wells in the vicinity of P-2 to determine the vertical and lateral extent of TCE contamination adjacent to the Willamette River.



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It is clear that the proposed work is inadequate to meet the objectives stated above. Furthermore, based on a conference call with representatives of Wacker on September 17, 2002 and MFA's September 20, 2002 letter, it is unclear whether the above objectives will be met in the near future. As a result, DEQ approves the proposed work with the following conditions:

1) All analytical data generated during the proposed investigation must be submitted within 30 days of the date of this letter.
2) A proposal for the installation of monitoring wells in the vicinity of P-2, GP-02-02 and the 1984 TCE spill area must be submitted to DEQ within 60 days of the date of this letter. The monitoring well installation proposal must include provisions for delineating the vertical extent of contamination below the 100 foot depth (where the TCE was detected) and selecting appropriate screen intervals. It is DEQ's expectation that a series of nested monitoring wells will be required to adequately define the extent of contamination.
3) The results of Wacker's research into the use of TCE at its facility and a proposal for the characterization of TCE source areas must be submitted to DEQ within 75 days of the date of this letter.

DEQ has stipulated the above time-frames due to its oft-stated concern regarding the lack of progress on further characterization of TCE contamination at the site. Under the terms of Unilateral Order No. ECVC-NWR-00-27, both Wacker and Northwest are obligated to perform the characterization necessary to evaluate sources and pathways of contamination from the Wacker site to the Willamette River. If the time-frames stated above are not met, DEQ will consider all enforcement options available under the Unilateral Order.

I may be reached at (503) 229-5648 if you wish to discuss this matter further or if you have any questions.

Sincerely,

Eric L. Blischke
Project Manager
Voluntary Cleanup and Portland Harbor Section

cc: Mike Rosen, NWR/DEQ
Kurt Burkholder, DOJ
Rod Struck, NWR/DEQ
Jennifer Peterson, NWR/DEQ

MAUL FOSTER ALONGI
ENVIRONMENTAL & ENGINEERING CONSULTANTS

PORTLAND, OREGON
SEATTLE, WASHINGTON
VANCOUVER, WASHINGTON

September 20, 2002

Mr. Eric Blischke
Coordinator, Portland Harbor
Oregon Department of Environmental Quality
2020 SW Fourth Avenue
Portland, Oregon 97201-4987

Re: Wacker Siltronic Corporation
Final Work Plan for Supplemental Remedial Investigation to Further Assess Trichloroethene Detections in the Northern Corner of Wacker Siltronic Corporation Site—7200 NW Front Avenue, Portland, Oregon 97210

Dear Eric:

At Wacker's request, MFA has prepared this work plan to further assess detections of TCE in the northern corner of the site. The scope of work described in the work plan will allow for more informed interpretations to be made regarding the source, nature, and extent of TCE detected in this portion of the site. The Department provided comments to the Work Plan in a letter dated September 6, 2002. On September 17, Wacker, DEQ, and MFA discussed the Department's September 6 letter via telephone. The work plan has been revised to reflect agreements made between Wacker and DEQ during the September 17 conference call. An overview of the site background and a description of the most recently collected TCE data are provided in the next section of the work plan.

## BACKGROUND

TCE has been detected in groundwater based on data collected by Hahn & Associates, Inc. (HAI) in August 2001[1] and by Limno-Tech, Inc. (LTI) in March 2002.[2] Field work conducted by HAI was done on behalf of Northwest Natural (NW Natural), and included exploratory drilling and soil and reconnaissance groundwater sampling at ten locations, designated P-1 through P-10, and the drilling and installation of three monitoring wells,

[1] Hahn & Associates, Inc., 2001. *Data Package for Focused Remedial Investigation, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* A report prepared for Northwest Natural. November 20.

[2] Limno-Tech, Inc., 2002. *Summary of the Remedial Investigation Activities from the Supplemental Remedial Investigation at Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* A report prepared for Wacker Siltronic Corporation. April 30.

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named WS-8-33, WS-8-59, and WS-9-34 (see Figure 1). TCE was detected in a groundwater sample collected from one of the exploratory borings (P-2, see Figure 1) at a concentration of 11,200 micrograms per liter (ug/L or parts per billion).

On behalf of Wacker, LTI performed followup work to assess the TCE detected by HAI. This included further evaluating two releases of wastewater with TCE that occurred in the immediate vicinity of Wacker's wastewater treatment system in December 1984 (see Figure 1). Shortly after the releases occurred, Wacker implemented a series of removal actions to excavate material potentially impacted by the release. Over 150 cubic yards of material was excavated during the course of the removal action(s). Analysis of confirmatory samples indicated that the removal work succeeded in removing TCE to concentrations of less than 1 milligram per kilogram (mg/kg or parts per million).

LTI's field program included drilling three exploratory borings, designated GP02-01, GP02-02, and GP02-03 (see Figure 1), and collecting soil and reconnaissance groundwater samples for analysis. The three exploratory borings were located within (GP02-01), west (GP02-02), and north-northwest (GP02-03) of the 1984 wastewater release area.

Review of data contained in LTI's April 2002 data package indicates the following:

- TCE was not detected in soil and/or groundwater samples collected from GP02-01 to the depth of drilling (i.e., 100 feet below ground surface [bgs]) at laboratory reporting limits of between 0.005 mg/kg and 1 mg/kg for soil, and 1 ug/L for groundwater.

- TCE was detected in soil and groundwater samples collected from GP02-02. The chemical was detected in soil at a maximum concentration of 1.97 mg/kg. TCE was detected in groundwater samples collected at depth intervals of 56 to 60 feet bgs and 96 to 100 feet bgs in concentrations of 21,000 ug/L and 575,000 ug/L, respectively.

- TCE was not detected at or above the reporting limit of 0.005 mg/kg in soil samples collected from GP02-03. TCE was detected in groundwater samples collected at depth intervals of 31 to 35 feet bgs (4.29 ug/L) and 56 to 60 feet bgs (33.4 ug/L).

The results of HAI's and LTI's work were reported to the DEQ in November 2001 and April 2002 respectively. In the May 31 letter to Wacker, the Department provided a list of



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recommendations for additional work to further evaluate the source and extent of the TCE detections, including:

1. Reviewing Wacker's files and facility construction records to identify potential sources of TCE.

2. Drilling to characterize the stratigraphy beneath the site.

3. Collecting and analyzing soil and groundwater samples from "identified source areas."

4. Evaluation of a source of dense nonaqueous-phase liquids in the subsurface.

5. Installation of monitoring wells near exploratory boring GP02-02, in the area of the 1984 wastewater release, and in the vicinity of boring P-2 to assess the lateral and vertical extent of contamination between the release and the Willamette River.

In response to DEQ's May 31 letter, Wacker requested that MFA develop a general approach for further assessing TCE detections in the northern portion of the site. During a meeting on August 1, the general approach was presented to, and agreed upon by, the Department. The DEQ agreed-upon approach consists of two components. The first component is a site background review to compile historical information regarding Wacker's TCE use at the site. The second component includes a focused soil and groundwater sampling program in the northern corner of Wacker's property.

This work plan (the Work Plan) has been prepared to provide the DEQ with the scope of work for conducting the focused soil and groundwater sampling work in the northern corner of the site. Field work will be performed consistent with applicable portions of HAI's remedial investigation work plan[3] and LTI's supplemental remedial investigation work plan.[4] The scope of work includes descriptions of the drilling procedures, soil and groundwater sampling methods, and the laboratory analytical program for the work.

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[3] Hahn & Associates, Inc. 2001. *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1. A work plan submitted to DEQ on behalf of Northwest Natural.

[4] Limno-Tech, Inc. 2002. *Workplan for Supplemental Remedial Investigation at Wacker Siltronic Corporation Property, Portland, Oregon.* March 6. A work plan submitted to the DEQ on behalf of Wacker.



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## SCOPE OF WORK

The focused exploratory drilling and soil and groundwater sampling work will be conducted in the northern corner of the Wacker site in the vicinity of boring P-2 (see Figure 2). The objective of the focused sampling program is to assess potential local source area(s) of TCE in the vicinity of boring P-2, and further evaluate the lateral and vertical distribution of the chemical in this portion of the site. The data generated by analyzing soil and groundwater samples collected during the drilling and sampling program will be used in conjunction with the site background review to develop recommendations for conducting additional field investigations of potential TCE source areas, as appropriate. The scope of work is organized into three tasks. Each task is further described below.

### Task 1—Project Coordination

Drilling and sampling activities will be scheduled as soon as practicable after the Work Plan is approved by the DEQ. The Department will be provided a minimum notice of one week before field work is initiated. The DEQ will also be verbally notified upon initiation and completion of field drilling and sampling work.

### Task 2—Focused Assessment of TCE Detections in the Northern Corner of the Property

Exploratory drilling and soil and groundwater sampling will be performed using methods similar to those used previously. Four temporary borings will be drilled in the vicinity of boring P-2 using Geoprobe™ drilling and sampling equipment (see Figure 2). The borings will be positioned to collect additional soil and groundwater data between P-2 and the northwest property line, between P-2 and boring P-3, between P-2 and boring GP02-03, and between P-2 and the north end of the Fab 1 Building.

The temporary borings will be decommissioned after drilling and sampling work is completed at each location. All of the borings will be drilled, sampled, and decommissioned according to applicable Oregon regulations.[5] The procedures that will be used in the field to conduct exploratory drilling and collect and analyze soil and groundwater samples are described below.

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[5] Oregon Water Resources Division. 1995. *Administrative Rules for Construction, Maintenance, and Abandonment of Monitoring Wells and Other Holes in Oregon.*



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## Exploratory Drilling

The locations of the four Geoprobe™ borings, designated GP-4 through GP-7, are shown on Figure 2. Geo-Tech Explorations, Inc. of Tualatin, Oregon (Oregon Monitoring Well Constructor License No. 1011), will provide the Geoprobe™ drilling equipment for this project.

Each of the four Geoprobe™ borings will be advanced to a projected depth of approximately 100 feet bgs. Based on observations made during the drilling of boring P-2 (see Figure 2), subsurface geologic material generally consists of unconsolidated sand with gravel from near land surface to 32.5 feet bgs (upper sand with gravel); intermediate depth mixtures of silt, sandy silt, silty sand, and fine sand to 53.5 feet bgs (intermediate depth material); and deeper fine sand to the bottom of the borehole at approximately 100 bgs. The depth of shallow groundwater in the uppermost saturated material was observed at a depth approximately 28 feet bgs during drilling. In addition, observations made during the drilling of boring P-1 (see Figure 2) indicate that subsurface material becomes "black and tarry" between 29 feet and 31 feet bgs.

Given the information summarized above, MFA recommends that dual-tube Geoprobe™ drilling equipment be used for this project. Borings will be advanced from land surface into finer-grained intermediate depth material observed between 30 feet and 35 feet bgs. Within this depth range a bentonite slurry seal will be placed in the borehole. The bentonite seal will be a minimum of 5 feet in length. The bentonite seal will be placed to reduce the potential for contamination, if any, encountered at shallow depth intervals to migrate vertically downward and cross-contaminate deeper sampling intervals.

Prior to initiating drilling at the site, the drilling equipment and all downhole sampling equipment will be cleaned using a high-pressure hot-water washer.

## Soil Sample Collection

Soil samples will be collected during drilling for visual observation and lithologic classification to the bottom depth of each boring. Soil will be collected continuously, or as site conditions allow, using a 5-foot-long Macro Core™ sampler designed for use with either 2.125-inch outside diameter (o.d.) or 3.25-inch o.d. drill rods. Following retrieval, soil will be described in the field by an MFA geologist working under the direct supervision of a geologist registered in the state of Oregon. Soil will be described using American Society for Testing and Materials (ASTM) Designation D2488-84, *Standard Practice for Description and Identification of Soils (Visual-Manual Procedures)*. Boring



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logs will be prepared for each of the four borings. Boring logs will include the project name and location, name of the drilling contractor, drilling method, sampling method, sample depths, and descriptions of the soils observed in the samples.

Depth discrete samples of soil will be selected for analysis from up to three depth intervals within the unsaturated zone. Soil samples will be retained using the criteria described by LTI except that the two upper soil samples will be selected for analysis based on measurements made in the field using a photoionization detector (PID) or a flame-ionization detector (FID). The third, and deepest, soil sample will be collected from just above the uppermost saturated material observed during drilling at each location (projected between 25 feet and 30 feet bgs).

The two upper soil samples will be selected for analysis based on measurements made in the field using the PID or FID. After subsurface material is retrieved from the unsaturated zone, a PID or an FID will be used to screen each core. Field measurements will be taken at intervals of 1 foot from small holes made in the soil core. Due to the resiliency of the membrane retaining the soil, the holes will be made using a battery powered drill. The drill bit will be decontaminated prior to use and after measurements are made on each soil core. The 1-foot section in each core exhibiting the highest PID or FID measurement will be selected and retained for possible testing. Immediately after the core has been opened for visual material observation, the selected section of the soil core will be carefully transferred from the sampler to labeled laboratory-supplied clear glass 8-ounce containers and placed on ice in a rigid shipping container. The two samples of unsaturated material from each boring exhibiting the highest PID or FID readings will be designated for analysis.

Samples designated for laboratory analysis will be delivered to Columbia Analytical Services (CAS), Kelso, Washington, for analysis. A custody seal will be placed over the lid of each shipping container and taped in place. Samples will be transported to CAS accompanied by chain-of-custody paperwork.

## Soil Sample Analysis

Up to 12 soil samples (three from each boring) will be collected and submitted to CAS for analysis. The samples will be analyzed for volatile organic compounds (VOCs), including TCE, using USEPA Method 8260B, and for polycyclic aromatic hydrocarbons (PAHs) by USEPA Method 8270, Selective Ion Method (SIM). These two groups of chemicals represent the analytes that have been detected at the most sampling locations at the highest concentrations on the NW Natural and Wacker properties.



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Review of data collected previously suggests that high concentrations of certain chemicals detected in soil and/or groundwater (e.g., PAHs) result in elevated laboratory method reporting limits (MRLs) for VOCs, including TCE. As the goal of this project is to further assess TCE concentrations in the vicinity of P-2, the analytical program for this project will attempt to attain lower MRLs than achieved previously. In order to do this, a series of sample dilutions will be analyzed for each soil and groundwater sample submitted to the laboratory. Using USEPA Method 8260B, the samples will be initially screened at a high dilution factor (e.g., 1:50). The initial screen is intended to quantify target analytes present in the highest concentrations. After this analysis is performed, the results will be reviewed and used to determine an appropriate dilution scheme for that sample. Subsequent analyses will be performed on less-diluted samples. Each sample will be analyzed at a dilution that will attain the lowest MRL allowable with respect to method/instrument capabilities and sample analyte concentrations.

Please note that according to CAS, the approach to diluting/analyzing samples described above does not require modifying USEPA Method 8260B. The unmodified analytical method is used to analyze the series of sample dilutions.

## Groundwater Sample Collection

Up to three depth discrete groundwater samples will be collected for analysis from each of the four Geoprobe™ borings. Drilling work completed to date suggests that shallow groundwater could occur at the base of the upper unconsolidated sand with gravel between 25 feet and 35 feet bgs. Two groundwater samples will be collected from below the intermediate depth material at depths of between 65 feet and 75 feet bgs and near the bottom of the borehole projected to be about 100 feet bgs. Samples will be collected using a 5-foot long, 1.5-inch o.d. Geoprobe™ water sampler. The sampler will be pushed to the desired depth and pulled back approximately 5 feet, exposing the internal stainless-steel wire-wrapped well point screen.

The volume of the groundwater inside the screen will be calculated and a minimum of one borehole volume will be removed prior to sample collection. New clean dedicated disposable polyethylene tubing will be connected to a vacuum pump. The vacuum pump will be used to purge the water from the well point screen. Water purged from the boring will be collected in a clean 1-quart jar attached inline between the tubing and the vacuum pump. The water in the 1-quart jar will be used to obtain field measurements (i.e., pH, specific conductance, temperature, and dissolved oxygen) with an Orion 1230 water quality meter. The polyethylene tubing will then be removed from the pump and fitted



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with a stainless-steel foot-valve. The tubing and valve will be used to collect the individual samples.

Groundwater samples will be collected using conventional methods associated with the Geoprobe™ drilling method. Groundwater will be drawn into the dedicated tubing via the foot-valve attached and using the tubing as an inertia pump. After groundwater is drawn into the tubing, the tubing will be retracted slowly from the rods and coiled. Groundwater will be poured directly from the tubing into the laboratory-supplied containers. Groundwater collected for VOC analysis will be poured into clear glass 40-milliliter vials. To the maximum extent practicable, the tubing will be handled to minimize agitation of the sample. PAH samples will be collected into 1-liter amber glass bottles. Samples retained for cyanide analysis will be collected into 1-liter polyethylene bottles with sodium hydroxide (NaOH) added as a preservative.

Field sampling activities (e.g., well-purging data, equipment used, sample containers, preservatives used) will be recorded at time of sample collection on field sampling data sheets.

After the groundwater samples have been collected, they will be labeled and placed on ice in a rigid shipping container with chain-of-custody paperwork. A custody seal will be placed over the lid of each shipping container, and then covered with packing tape. Samples will be delivered to CAS in Kelso, Washington, for analysis.

## Groundwater Sample Analysis

Groundwater samples will be submitted to CAS for analysis of VOCs, PAHs, and cyanide using USEPA Method 8260B, USEPA Method 8270 SIM, and USEPA Method 9010B respectively. Groundwater samples will be analyzed for VOCs using the same analytical approach as described above for soil samples.

## Laboratory QA/QC Data Evaluation and Management

Raw data from the field, and from the contract laboratory, will be downloaded into a computerized database (Access) and reviewed for acceptability. Analytical data will be reviewed to assess whether they meet project-specific data quality objectives. Review will be based on accepted USEPA procedures for evaluating data generated from the analysis



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of organic chemicals.[6] After completing the data review, a summary report will be prepared to support specific or routine report deliverables.

### Task 3—Reporting

The results of the focused soil and groundwater sampling will be incorporated into a report summarizing the work completed at the Wacker site to date. The report will provide an overview of the regulatory status of the site, interpretations regarding the subsurface geology, a preliminary conceptual site hydrogeologic model, and preliminary interpretations regarding the distribution of soil and groundwater impacts at the site. The report will also include tables that provide drilling and construction details for on-site exploratory borings and monitoring wells, historical groundwater elevation measurements, and compilations of analyte detections. Figures will be included that show sampling locations, illustrate subsurface geologic interpretations (i.e., generalized geologic cross-sections), and depict the hydraulic gradient at selected depths beneath the site. Copies of logs of exploratory borings and monitoring wells, compiled soil and groundwater data, and laboratory analytical reports will be attached to the report as supporting documentation.

The data collected from the focused sampling program, previous on-site geologic and hydrogeologic evaluations, and the site background review will form the basis for developing recommendations for assessing potential source areas of TCE impacts in the northern portion of the Wacker site.

## SCHEDULE

As discussed during the September 17 conference call, work related to the focused soil and groundwater sampling program of the northern corner of the Wacker site has been scheduled to begin on September 25. Drilling and sampling activities are projected for completion in 15 to 20 business days. Based on analyzing soil and groundwater samples on a normal turnaround basis, and depending on the laboratory's backlog, the final laboratory analytical reports should be available for review within 15 to 20 business days of receipt of the samples by the laboratory. Preparation of the data summary report will be initiated upon DEQ's approval of the Work Plan. Based on the timeframe outlined for the

[6] USEPA. 1994b. *USEPA Contract Laboratory Program National Functional Guidelines for Organics Data Review.* U.S. Environmental Protection Agency, Office of Emergency and Remedial Response. EPA 540/94/012. February.



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focused sampling program, MFA projects that the site summary report will be submitted to DEQ by the middle of December.

Given the current project start date, Wacker would appreciate receiving written approval to proceed with the scope of work prior to initiating field work.

Please feel free to contact with questions and/or comments about this letter, or if you need additional assistance.

Sincerely,

Maul Foster & Alongi, Inc.

Dana S. Bayuk
Principal Hydrogeologist

Attachments: Figures 1 and 2

cc: Rod Struck, DEQ
✓ Cathryn Young, Wacker
Tom McCue, Wacker
Myron Burr, Wacker
Christopher Reive, Jordan Schrader



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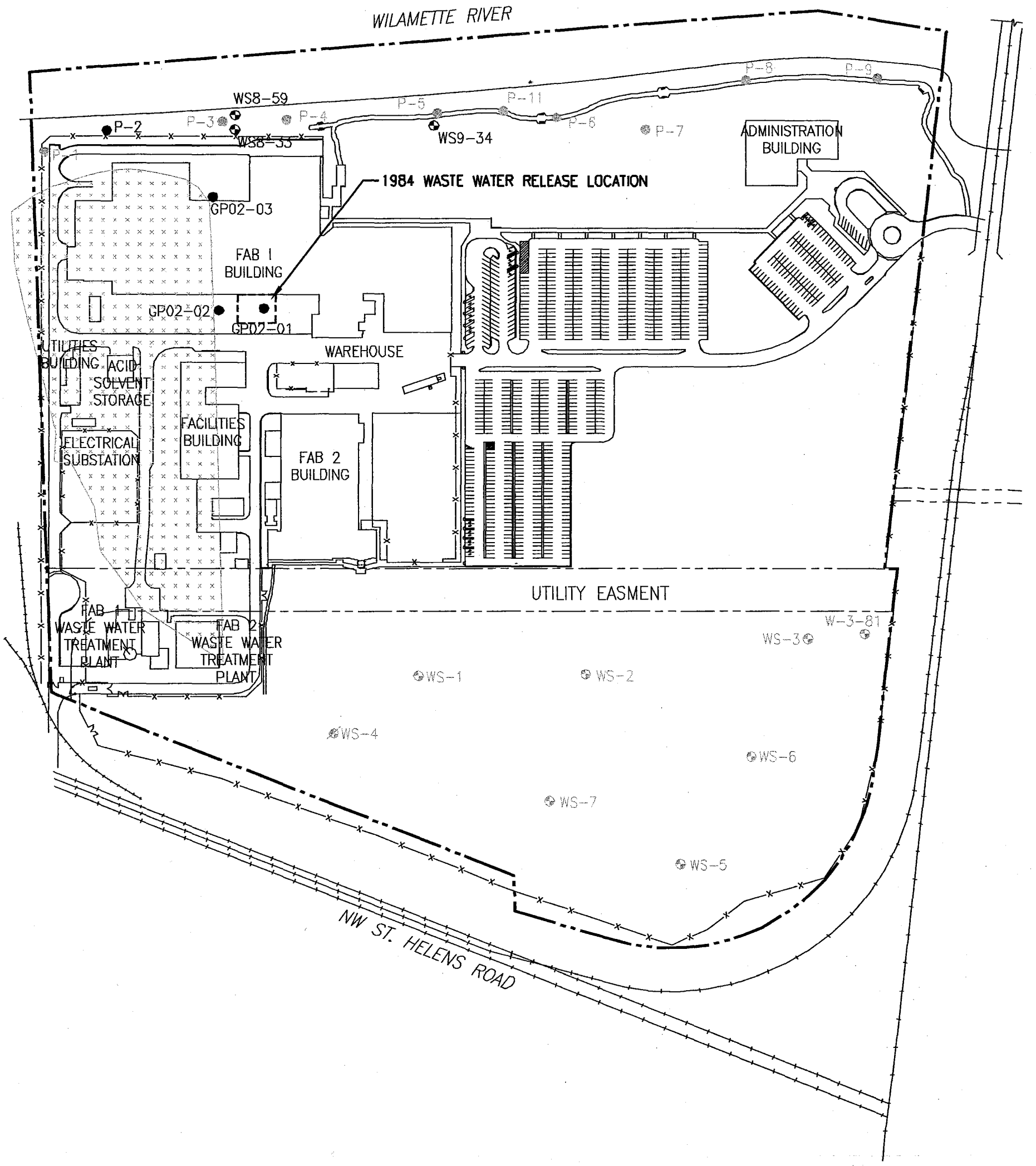


LEGEND:

PROPERTY BOUNDARY

EXISTING MONITORING WELL

ABANDONED MONITORING WELL

GEOPROBE (PUSH-PROBE) SAMPLE LOCATION

FORMER LOWLAND PONDED AREA

0 120 240

SCALE IN FEET

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Suite B
7223 NE Hazel Dell Ave.
Vancouver, WA 98665
P 360.694.2691
F 360.906.1958

MAUL FOSTER ALONGI

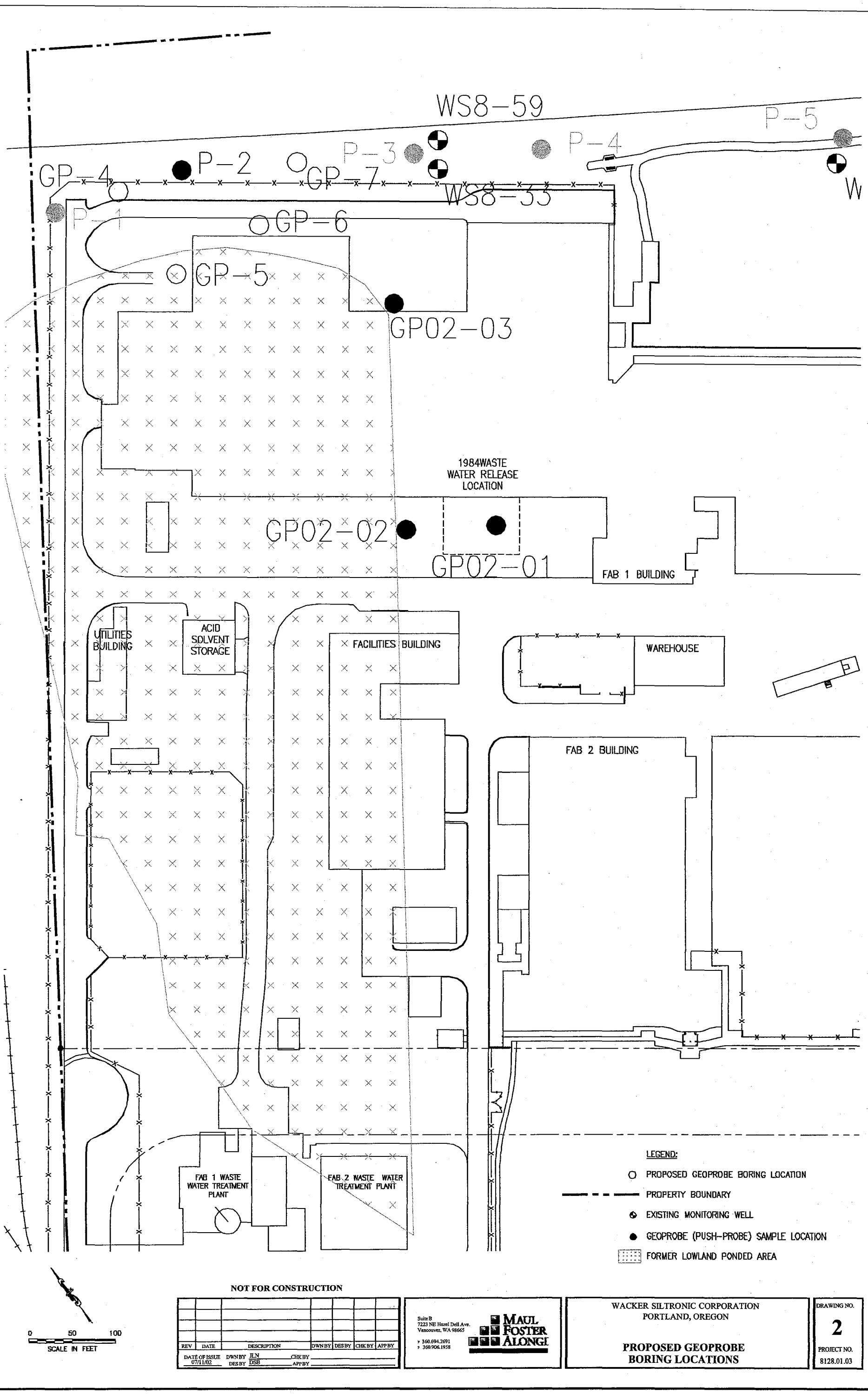

WACKER SILTRONIC CORPORATION
PORTLAND, OREGON

**SITE FEATURES**

DRAWING NO. 1

PROJECT NO. 8128.01.03

LAYOUT: 1

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MAUL FOSTER ALONGI


WACKER SILTRONIC CORPORATION
PORTLAND, OREGON

**PROPOSED GEOPROBE BORING LOCATIONS**

DRAWING NO. **2**

PROJECT NO. 8128.01.03

LAYOUT: 2

Oregon
John A. Kitzhaber, M.D., Governor

Department of Environmental Quality
Northwest Region
2020 SW Fourth Avenue
Suite 400
Portland, OR 97201-4987
(503) 229-5263 Voice
TTY (503) 229-5471

September 6, 2002

Mr. Bob Wyatt
Northwest Natural
220 NW Second Avenue
Portland, OR 97209

Ms. Cathryn Young
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, OR 97210

Re: Work Plan for Supplemental Investigation to Further Assess Trichloroethene Detections in the Northern Corner of Wacker Siltronic Corporation Site

Dear Bob and Cathryn:

The Oregon Department of Environmental Quality has reviewed the Work Plan for Supplemental Investigation to Further Assess Trichloroethene Detections in the Northern Corner of Wacker Siltronic Corporation Site (Work Plan). The Work Plan was submitted by Maul Foster Alongi (MFA) on behalf of Wacker Siltronic Corporation and was received by DEQ on August 16, 2002. The Work Plan was submitted in response to DEQ's letter dated May 31, 2002.

General Comments:

Overall, DEQ supports the proposed work going forward with the modifications requested in the specific comments outlined below. However, DEQ would like to reiterate its concern that the scope of the proposed investigation somewhat limited. The proposed work does not include an evaluation of potential trichloroethene (TCE) source areas nor the installation of monitoring wells as requested in our May 31, 2002 letter. DEQ would like to make it clear that the installation of monitoring wells and characterization of TCE source areas will be required in the future based on the results of this GeoProbe investigation and the review of Wacker information regarding the historic use of TCE at the site.

Specific Comments:

Page 5. Task 2. Soil Sample Collection. Soil samples should be collected on a continuous basis to total depth for the purpose of understanding the stratigraphy at the site, developing the site hydrogeologic conceptual site model and evaluating the migration of dense non-aqueous phase liquid (DNAPL) at the site. The TCE concentrations detected in groundwater clearly indicate the potential presence of DNAPL at the site.



SCOEPA00010645

Page 5. Task 2. Soil Sample Collection. In the fifth paragraph, the work plan states that "After the portions of the soil core have been selected, soil samples will be removed....." The timing of these samples is unclear. Soil samples must be collected immediately after opening the soil core to prevent contaminant loss through volatilization.

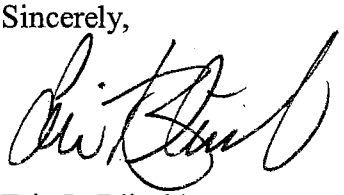
Page 6. Task 2. Groundwater Sample Collection. The proposed depths of groundwater samples are unclear. The Work Plan states that up to 3 samples will be collected per boring but only two depths are proposed. Groundwater samples should be collected every 10 – 15 feet beginning at the 55 – 60' depth interval to the bottom of the borehole. In addition, a shallow groundwater sample (above the silt) should also be collected. This will provide data on the vertical water chemistry profile and aid the understanding of contaminant migration pathways, the identification of future monitoring well screen intervals and the identification of potential source areas. If possible, samples should be collected at depths greater than 100 feet in order to define the vertical extent of contamination.

Page 7. Task 2. Groundwater Sample Collection. The work plan does not indicate what field parameters will be measured. DEQ assumes at a minimum, temperature, specific conductivity, pH, and dissolved oxygen will be measured.

Page 7. Task 2. Groundwater Sample Analysis. Cyanide has been consistently detected in groundwater at concentrations exceeding AWQC. As a result, cyanide should be included in the target analyte list.

Please have a revised work plan submitted within 3 weeks of the date of this letter. I may be reached at (503) 229-5648 if you wish to discuss this matter further or if you have any questions.

Sincerely,



Eric L. Blischke
Project Manager
Voluntary Cleanup and Portland Harbor Section

cc: Mike Rosen, NWR/DEQ
Rod Struck, NWR/DEQ
Jennifer Peterson, NWR/DEQ

MAUL FOSTER ALONGI
ENVIRONMENTAL & ENGINEERING CONSULTANTS

PORTLAND, OREGON
SEATTLE, WASHINGTON
VANCOUVER, WASHINGTON

August 16, 2002

Mr. Eric Blischke
Coordinator, Portland Harbor
Oregon Department of Environmental Quality
2020 SW Fourth Avenue
Portland, OR 97201-4987

Re: Wacker Siltronic Corporation
Work Plan for Supplemental Remedial Investigation to Further Assess Trichloroethene Detections in the Northern Corner of Wacker Siltronic Corporation Site - 7200 NW Front Avenue, Portland, Oregon 97210

Dear Eric:

At Wacker's request, MFA has prepared this work plan to further assess detections of TCE in the northern corner of the site. The scope of work described in the work plan will allow for more informed interpretations to be made regarding the source, nature, and extent of TCE detected in this portion of the site. An overview of the site background and a description of the most recently collected TCE data are provided in the next section of the work plan.

## BACKGROUND

TCE has been detected in groundwater based on data collected by Hahn & Associates, Inc. (HAI) in August 2001[1] and by Limno-Tech, Inc. (LTI) in March 2002[2]. Field work conducted by HAI was done on behalf of Northwest Natural (NW Natural), and included exploratory drilling and soil and reconnaissance groundwater sampling at ten locations, designated P-1 through P-10, and the drilling and installation of three monitoring wells, named WS-8-33, WS-8-59, and WS-9-34 (see Figure 1). TCE was detected in a groundwater sample collected from one of the exploratory borings (P-2, see Figure 1) at a concentration of 11,200 micrograms per liter (ug/L or parts per billion).

On behalf of Wacker, LTI performed follow-up work to assess the TCE detected by HAI. This included further evaluating two releases of wastewater with TCE that occurred in the

[1] Hahn & Associates, Inc., 2001. *Data Package for Focused Remedial Investigation, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* A report prepared for Northwest Natural. November 20.

[2] Limno-Tech, Inc., 2002. *Summary of the Remedial Investigation Activities from the Supplemental Remedial Investigation at Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* A report prepared for Wacker Siltronic Corporation. April 30.

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immediate vicinity of Wacker's wastewater treatment system in December 1984 (see Figure 1). Shortly after the releases occurred, Wacker implemented a series of removal actions to excavate material potentially impacted by the release. Over 150 cubic yards of material was excavated during the course of the removal action(s). Analysis of confirmatory samples indicated that the removal work succeeded in removing TCE to concentrations of less than 1 milligram per kilogram (mg/kg or parts per million).

LTI's field program included drilling three exploratory borings, designated GP02-01, GP02-02, and GP02-03 (see Figure 1), and collecting soil and reconnaissance groundwater samples for analysis. The three exploratory borings were located within (GP02-01), west (GP02-02), and north-northwest (GP02-03) of the 1984 wastewater release area.

Review of data contained in LTI's April 2002 data package indicates the following:

- TCE was not detected in soil and/or groundwater samples collected from GP02-01 to the depth of drilling (i.e., 100 feet below ground surface [bgs]) at laboratory reporting limits of between 0.005 mg/kg and 1 mg/kg for soil, and 1 ug/L for groundwater.

- TCE was detected in soil and groundwater samples collected from GP02-02. The chemical was detected in soil at a maximum concentration of 1.97 mg/kg. TCE was detected in groundwater samples collected at depth intervals of 56 to 60 feet bgs and 96 to 100 feet bgs in concentrations of 21,000 ug/L and 575,000 ug/L, respectively.

- TCE was not detected at or above the reporting limit of 0.005 mg/kg in soil samples collected from GP02-03. TCE was detected in groundwater samples collected at depth intervals of 31 to 35 feet bgs (4.29 ug/L) and 56 to 60 feet bgs (33.4 ug/L).

The results of HAI's and LTI's work were reported to the DEQ in November 2001 and April 2002 respectively. In the May 31 letter to Wacker, the Department provided a list of recommendations for additional work to further evaluate the source and extent of the TCE detections, including:

1. Reviewing Wacker's files and facility construction records to identify potential sources of TCE.

2. Drilling to characterize the stratigraphy beneath the site.



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3. Collecting and analyzing soil and groundwater samples from "identified source areas".

4. Evaluation of a source of dense non-aqueous phase liquids in the subsurface.

5. Installation of monitoring wells near exploratory boring GP02-02, in the area of the 1984 wastewater release, and in the vicinity of boring P-2 to assess the lateral and vertical extent of contamination between the release and the Willamette River.

In response to DEQ's May 31 letter, Wacker requested that MFA develop a general approach for further assessing TCE detections in the northern portion of the site. During a meeting on August 1, the general approach was presented to, and agreed upon by the Department. The DEQ agreed upon approach consists of two components. The first component is a site background review to compile historic information regarding Wacker's TCE use at the site. The second component includes a focused soil and groundwater sampling program in the northern corner of Wacker's property.

This work plan (the Work Plan) has been prepared to provide the DEQ with the scope of work for conducting the focused soil and groundwater sampling work in the northern corner of the site. Field work will be performed consistent with applicable portions of HAI's remedial investigation work plan[3] and LTI's supplemental remedial investigation work plan[4]. The scope of work includes descriptions of the drilling procedures, soil and groundwater sampling methods, and the laboratory analytical program for the work.

## SCOPE OF WORK

The focused exploratory drilling and soil and groundwater sampling work will be conducted in the northern corner of the Wacker site in the vicinity of boring P-2 (see Figure 2). The objective of the focused sampling program is to assess potential local source area(s) of TCE in the vicinity of boring P-2, and further evaluate the lateral and vertical distribution of the chemical in this portion of the site. The data generated by analyzing soil and groundwater samples collected during the drilling and sampling program will be used in conjunction with the site background review to develop recommendations for conducting additional field investigations of potential TCE source areas, as appropriate. The scope of work is organized into three tasks. Each task is further described below.

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[3] Hahn & Associates, Inc. 2001. *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1. A work plan submitted to DEQ on behalf of Northwest Natural.

[4] Limno-Tech, Inc. 2002. *Workplan for Supplemental Remedial Investigation at Wacker Siltronic Corporation Property, Portland, Oregon.* March 6. A work plan submitted to the DEQ on behalf of Wacker.

## Task 1 – Project Coordination

Drilling and sampling activities will be scheduled as soon as practicable after the Work Plan is approved by the DEQ. The Department will be provided a minimum notice of one week before field work is initiated. The DEQ will also be verbally notified upon initiation and completion of field drilling and sampling work.

## Task 2 - Focused Assessment of TCE Detections in the Northern Corner of the Property

Exploratory drilling and soil and groundwater sampling will be performed using methods similar to those used previously. Four temporary borings will be drilled in the vicinity of boring P-2 using Geoprobe® drilling and sampling equipment (see Figure 2). The borings will be positioned to collect additional soil and groundwater data between P-2 and the northwest property line, between P-2 and boring P-3, between P-2 and boring GP02-03, and between P-2 and the north end of the Fab 1 Building.

The temporary borings will be decommissioned after drilling and sampling work is completed at each location. All of the borings will be drilled, sampled, and decommissioned according to applicable Oregon regulations[5]. The procedures that will be used in the field to conduct exploratory drilling and collect and analyze soil and groundwater samples are described below.

### Exploratory Drilling

The locations of the four Geoprobe® borings, designated GP-4 through GP-7, are shown on Figure 2. Geo-Tech Explorations, Inc. of Tualatin, Oregon, (Oregon Monitoring Well Constructor License No. 1011) will provide the Geoprobe® drilling equipment for this project.

Each of the four Geoprobe® borings will be advanced to a projected depth of approximately 100 feet bgs. Based on observations made during the drilling of boring P-2 (see Figure 2), subsurface geologic material generally consists of unconsolidated sand with gravel from near land surface to 32.5 feet bgs (upper sand with gravel); intermediate depth mixtures of silt, sandy silt, silty sand, and fine sand to 53.5 feet bgs (intermediate depth material); and deeper fine sand to the bottom of the borehole at approximately 100 bgs. The depth of shallow groundwater in the upper-most saturated material was observed at a depth

[5] Oregon Water Resources Division. 1995. *Administrative Rules for Construction, Maintenance, and Abandonment of Monitoring Wells and Other Holes in Oregon.*



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approximately 28 feet bgs during drilling. In addition, observations made during the drilling of boring P-1 (see Figure 2) indicate that subsurface material becomes "black and tarry" between 29 feet and 31 feet bgs.

Given the information summarized above, MFA recommends that dual-tube Geoprobe® drilling equipment be used for this project. Borings will be advanced from land surface into finer grained intermediate depth material observed between 30 feet and 35 feet bgs. Within this depth range a bentonite slurry seal will be placed in the borehole. The bentonite seal will be a minimum of 5 feet in length. The bentonite seal will be placed to reduce the potential for contamination, if any, encountered at shallow depth intervals to migrate vertically downward and cross-contaminate deeper sampling intervals.

Prior to initiating drilling at the site the drilling equipment and all downhole sampling equipment will be cleaned using a high-pressure hot-water washer.

## Soil Sample Collection

Soil samples will be collected during drilling for visual observation and lithologic classification to the bottom depth of each boring. Soil will be collected continuously, or as site conditions allow, using a five foot long Macro Core$^{tm}$ samplers designed for use with either 2.125-inch outside diameter (o.d.) or 3.25-inch o.d. drill rods. Following retrieval, soil will be described in the field by an MFA geologist working under the direct supervision of a geologist registered in the state of Oregon. Soil will be described using American Society for Testing and Materials (ASTM) Designation D2488-84, *Standard Practice for Description and Identification of Soils (Visual-Manual Procedures)*. Boring logs will be prepared for each of the four borings. Boring logs will include the project name and location, name of the drilling contractor, drilling method, sampling method, sample depths, and descriptions of the soils observed in the samples.

Depth discrete samples of soil will be selected for analysis from up to three depth intervals within the unsaturated zone. Soil samples will be retained using the criteria described by LTI except that the two upper soil samples will be selected for analysis based on measurements made in the field using a photoionization detector or a flame-ionization detector. The third, and deepest, soil sample will be collected from just above the upper-most saturated material observed during drilling at each location (projected between 25 feet and 30 feet bgs).

After the portions of the soil core have been selected, soil samples will be carefully removed from the sampler and placed in laboratory supplied clear glass 8-ounce containers. Sample containers will be labeled and placed on ice in a rigid shipping container with chain-of-custody paper work. A custody seal will be placed over the lid of each shipping container



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and taped in place. Samples will be delivered to Columbia Analytical Services, Inc. (CAS), Kelso, Washington for analysis.

## Soil Sample Analysis

Up to twelve soil samples (three from each boring) will be collected and submitted to CAS for analysis. The samples will be analyzed for volatile organic compounds (VOCs), including TCE, using USEPA Method 8260B, and for polycyclic aromatic hydrocarbons (PAHs) by USEPA Method 8270, Selective Ion Method. These two groups of chemicals represent the analytes that have been detected at the most sampling locations at the highest concentrations on the NW Natural and Wacker properties.

Review of data collected previously, suggests that high concentrations of certain chemicals detected in soil and/or groundwater (e.g., PAHs) result in elevated laboratory method reporting limits (MRLs) for VOCs, including TCE. As the goal of this project is to further assess TCE concentrations in the vicinity of P-2, the analytical program for this project will attempt to attain lower MRLs than achieved previously. In order to do this, a series of sample dilutions will be analyzed for each soil and groundwater sample submitted to the laboratory. Using USEPA Method 8260B, the samples will be initially screened at a high dilution factor (e.g., 1:50). The initial screen is intended to quantify target analytes present in the highest concentrations. After this analysis is performed, the results will be reviewed and used to determine an appropriate dilution scheme for that sample. Subsequent analyses will be performed on less diluted samples. Each sample will be analyzed at a dilution that will attain the lowest MRL allowable with respect to method/instrument capabilities and sample analyte concentrations.

Please note, that according to CAS, the approach to diluting/analyzing samples described above does not require modifying USEPA Method 8260B. The unmodified analytical method is used to analyze the series of sample dilutions.

## Groundwater Sample Collection

Up to three depth discrete groundwater samples will be collected for analysis from each of the four Geoprobe® borings. Drilling work completed to date suggests that shallow groundwater could occur at the base of the upper unconsolidated sand with gravel between 25 feet and 35 feet bgs. Two groundwater samples will be collected from below the intermediate depth material at depths of between 65 feet and 75 feet bgs and at near the bottom of the borehole projected to be about 100 feet bgs. Samples will be collected using a 5-foot long, 1.5-inch o.d. Geoprobe® water sampler. The sampler will be pushed to the



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desired depth and pulled back approximately five feet, exposing the internal stainless steel wire-wrapped well point screen.

The volume of the groundwater inside the screen will be calculated and a minimum of one borehole volume will be removed prior to sample collection. New clean dedicated disposable polyethylene tubing will be connected to a vacuum pump. The vacuum pump will be used to purge the water from the well point screen. Water purged from the boring will be collected in a clean 1-quart jar attached inline between the tubing and the vacuum pump. The water in the 1-quart jar will be used to obtain field measurements with an Orion 1230 water quality meter. The polyethylene tubing will then be removed from the pump and fitted with a stainless steel foot-valve. The tubing and valve will be used to collect the individual samples.

Groundwater samples will be collected using conventional methods associated with the Geoprobe® drilling method. Groundwater will be drawn into the dedicated tubing via the foot-valve attached and using the tubing as an inertia pump. After groundwater is drawn into the tubing, the tubing will be retracted slowly from the rods and coiled. Groundwater will be poured directly from the tubing into the laboratory-supplied containers. Groundwater collected for VOC analysis will be poured in to clear glass 40-milliliter vials. To the maximum extent practicable, the tubing will be handled to minimize agitation of the sample. PAH samples will be collected into 1-liter amber glass bottles.

Field sampling activities (e.g., well-purging data, equipment used, sample containers, preservatives used) will be recorded at time of sample collection on field sampling data sheets.

After the groundwater samples have been collected, they will be labeled and placed on ice in a rigid shipping container with chain-of-custody paper work. A custody seal will be placed over the lid of each shipping container, and then covered with packing tape. Samples will be delivered to CAS in Kelso, Washington for analysis.

## Groundwater Sample Analysis

Groundwater samples will be submitted to CAS for analysis of VOCs and PAHs using USEPA Method 8260B and USEPA Method 8270 SIM respectively. Groundwater samples will be analyzed for VOCs using the same analytical approach as described above for soil samples.

## Laboratory QA/QC Data Evaluation and Management

Raw data from the field, and from the contract laboratory, will be downloaded into a computerized database (Access) and reviewed for acceptability. Analytical data will be reviewed to assess whether they meet project-specific data quality objectives. Review will be based on accepted USEPA procedures for evaluating data generated from the analysis of organic chemicals[6]. After completing the data review, a summary report will be prepared to support specific or routine report deliverables.

## Task 3 - Reporting

The results of the focused soil and groundwater sampling will be incorporated into a report summarizing the work completed at the Wacker site to date. The report will provide an overview of the regulatory status of site, interpretations regarding the subsurface geology, a preliminary conceptual site hydrogeologic model, and preliminary interpretations regarding the distribution of soil and groundwater impacts at the site. The report will also include tables that provide drilling and construction details for on-site exploratory borings and monitoring wells, historic groundwater elevation measurements, and compilations of analyte detections. Figures will be included that show sampling locations, illustrate subsurface geologic interpretations (i.e., generalized geologic cross-sections), and depict the hydraulic gradient at selected depths beneath the site. Copies of logs of exploratory borings and monitoring wells, compiled soil and groundwater data, and laboratory analytical reports will be attached to the report as supporting documentation.

The data collected from the focused sampling program, previous on-site geologic and hydrogeologic evaluations, and the site background review, will form the basis for developing recommendations for assessing potential source areas of TCE impacts in the northern portion of the Wacker site.

## SCHEDULE

Work related to the focused soil and groundwater sampling program of the northern corner of the Wacker site will be initiated upon obtaining DEQ's written approval of this Work Plan. Subject to drilling subcontractor availability, MFA projects that field work will be initiated 15 to 20 business days from receiving Work Plan approval. Drilling and sampling activities are projected for completion in 15 to 20 business days. Based on analyzing soil

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[6] USEPA. 1994b. *USEPA Contract Laboratory Program National Functional Guidelines for Organics Data Review.* U.S. Environmental Protection Agency, Office of Emergency and Remedial Response. EPA 540/94/012. February.



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## SCHEDULE

Work related to the focused soil and groundwater sampling program of the northern corner of the Wacker site will be initiated upon obtaining DEQ's written approval of this Work Plan. Subject to drilling subcontractor availability, MFA projects that field work will be initiated 15 to 20 business days from receiving Work Plan approval. Drilling and sampling activities are projected for completion in 15 to 20 business days. Based on analyzing soil and groundwater samples on a normal turn-around basis, and depending on the laboratory's backlog, the final laboratory analytical reports should be available for review with 15 to 20 business days of receipt of the samples by the laboratory. Preparation of the data summary report will be initiated upon DEQ's approval of the Work Plan. Based on the timeframe outlined for the focused sampling program, MFA projects that the site summary report will be submitted to DEQ by the middle of December.

Please feel free to contact with questions and/or comments about this letter, or if you need additional assistance.

Sincerely,

Maul Foster & Alongi, Inc.

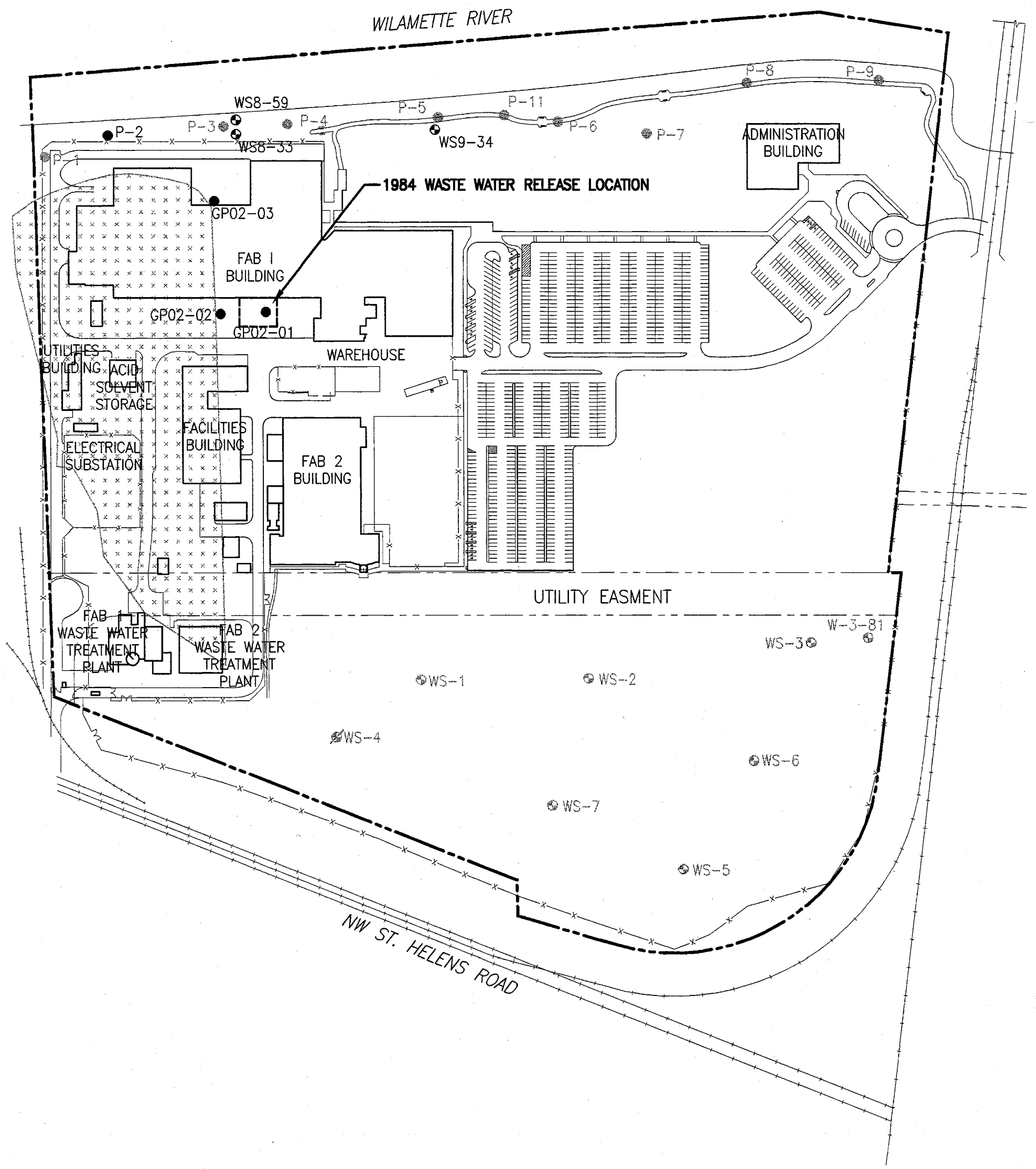
Dana S. Bayuk
Principal Hydrogeologist

Attachment: Figures 1 and 2

Cc: Rod Struck, DEQ
Cathryn Young, Wacker
Tom McCue, Wacker
Myron Burr, Wacker
Christopher Reive, Jordan Schrader



SCOEPA00010655




LEGEND:

- PROPERTY BOUNDARY
- EXISTING MONITORING WELL
- ABANDONED MONITORING WELL
- GEOPROBE (PUSH-PROBE) SAMPLE LOCATION
- FORMER LOWLAND PONDED AREA

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**NOT FOR CONSTRUCTION**

**PRELIMINARY DRAFT**

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MAUL FOSTER ALONGI


WACKER SILTRONIC CORPORATION
PORTLAND, OREGON

**SITE FEATURES**

DRAWING NO. 1
PROJECT NO. 8128.01.03


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WS8-59

P-5

P-3

P-4

P-2

GP-4

GP-7

W

WS8-33

P-1

GP-6

GP-5

GP02-03

1984WASTE
WATER RELEASE
LOCATION

GP02-02

GP02-01

FAB 1 BUILDING

UTILITIES BUILDING

ACID SOLVENT STORAGE

FACILITIES BUILDING

WAREHOUSE

FAB 2 BUILDING

FAB 1 WASTE WATER TREATMENT PLANT

FAB 2 WASTE WATER TREATMENT PLANT

LEGEND:

- PROPOSED GEOPROBE BORING LOCATION
- PROPERTY BOUNDARY
- EXISTING MONITORING WELL
- GEOPROBE (PUSH-PROBE) SAMPLE LOCATION
- FORMER LOWLAND PONDED AREA

0 50 100

SCALE IN FEET

NOT FOR CONSTRUCTION

| REV | DATE | DESCRIPTION | DWN BY | DES BY | CHK BY | APP BY |
|---|---|---|---|---|---|---|
| | | | | | | |

DATE OF ISSUE 07/1/02 DWN BY JLN CHK BY
DES BY DSB APP BY

Suite B
7223 NE Hazel Dell Ave.
Vancouver, WA 98665
P 360.694.2691
F 360.906.1958

MAUL FOSTER ALONGI

WACKER SILTRONIC CORPORATION
PORTLAND, OREGON

**PROPOSED GEOPROBE BORING LOCATIONS**

DRAWING NO. 2

PROJECT NO. 8128.01.03

File: G:\8000\8128-01_WACKER SILTRONIC\001\PRESENTATION-MEETING\PROPOSED SAMPLES.DWG Last edited: AUG. 16, 2002 @ 12:57 p.m. by: jness Xrefs: SITE-BASE black/white

LAYOUT: 2

WACKER SILTRONIC

**CATHRYN YOUNG**
SENIOR MANAGER
CENTRAL ENGINEERING

**Wacker Siltronic Corporation**
7200 NW Front Avenue
Portland OR 97210-3676, USA
Tel. +1 503 219 7406
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cathryn_young@siltronic.com

May 20, 2003

Matt McClincy, Project Manager
Voluntary Cleanup and Portland Harbor Section
Oregon Department of Environmental Quality
2020 SW Fourth Avenue, Suite 400
Portland, OR 97201-4987

Re: DEQ Oversight Costs Related to RI at Wacker Siltronic

Matt:

This replies to your request that Wacker Siltonic Corportation ("Wacker") consider assuming financial responsibility for some portion of DEQ's oversight expenses currently being incurred to manage the RI activites underway at Wacker's Portland facility, pursuant to Order No. ECVC-NWR-00-27 ("Order").

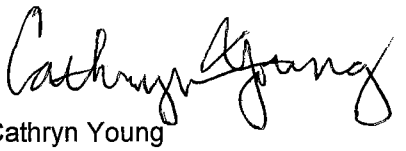
As you know, after Wacker received the Order and concluded negotiations with Northwest Natural Gas Company ("NNGC"), NNGC agreed to conduct the Work described within the Order. As a result, NNGC is contractually responsible for DEQ's oversight expenses related to the Order. This was documented in the form of a Limited Access Agreement between Wacker and NNGC that contains this specific provision. DEQ's past invoices for oversight costs have been properly conveyed to the responsible party.

Wacker has considered your request in light of its decision to perform the current investigation of subsurface TCE below Wacker's property. And, while Wacker believes that NNGC's work related to its responsibilities under the Order are not complete, for now the tasks being performed by Wacker and NNGC are reasonably discrete. Each investigation is traveling a seperate path. We also note that you have offered to segregate DEQ's oversight expenses to be speciifc to your review of the tasks that Wacker and NNGC are seperately performing, and to provide seperate invoices for the services DEQ provides.

In the interest of addressing both DEQ's and NNGC's concern in this regard, Wacker will accept and assume direct responsibility to DEQ for payment of DEQ's unpaid and future reasonable oversight expenses related specifically to the subsurface TCE investigation. This decision is without waiver of Wacker's rights and defenses to recover these costs or to cease paying them directly to DEQ as allowed by law or Rule. To the exent you have withheld billings to or instructed NNGC to hold and not pay invoices that include charges for DEQ oversight expenses specific to RI activites that Wacker is performing, Wacker will pay for DEQ's reasonable oversight costs directly attributable to that work. We will take you up on your offer, and request that DEQ seperately invoice Waker for those unpaid and future costs as they accrue.

If you have any questions, please call.

WACKER SILTRONIC CORPORATION



Cathryn Young
Senior Manager
Central Engineering

cc: Bob Wyatt, NNGC
Kurt Burkholder, DOJ
Jim Maul, MFA
Christopher Reive, Jordan Schrader

**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL CONSULTANTS

April 15, 2003

Mr. Matt McClincy
Oregon Department of Environmental Quality
Northwest Region, Portland Office
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland OR 97201-4987

HAI Project No. 5237

SUBJECT: March 2003 Progress Report for Remedial Investigation (RI) Activities, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. McClincy:

Hahn and Associates, Inc. (HAI) has prepared this Progress Report summarizing RI work activities conducted by NW Natural that have occurred relating to the Wacker Siltronic Corporation (Wacker) property during the month of March 2003. RI field activities for the site are being conducted as per the approved *Final Focused Remedial Investigation (RI) Work Plan*[1] (RI Work Plan), as well as the approved *Supplemental RI Work Plan* [2]. This Progress Report has been prepared as per an Order (DEQ No. ECVC-NWR-00-27) issued jointly to both NW Natural and Wacker by the Oregon Department of Environmental Quality (DEQ), dated October 4, 2000. As per the referenced Order, monthly progress reports are to be prepared by the 15th day of each month, with the reporting to continue for the duration of the project.

**Summary of Activities in March 2003**

During March 2003, NW Natural worked on development of the Phase I Site Characterization RI Summary Report and Source Control Evaluation documenting investigatory activities completed by NW Natural as part of RI activities completed to date. With the exception of inquiring as to site access, as described below, no further RI activities related to the Wacker property were conducted by NW Natural during the month of March.

**Anticipated / Completed Activities in May and June 2003**

The only remaining RI data collection task to be completed at the site involves an inspection and survey of the base of the drainage ditch located on Burlington Northern Santa Fe Railway (BNSF) property immediately west and south of the Wacker property. Initiation of this task will require receipt of access approval from BNSF, the owner of the right-of-way through which the ditch runs. A proposed access agreement has been reviewed and approved by NW Natural. NW Natural is presently awaiting approval and

[1] Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1, 2001.

[2] Hahn and Associates, Inc. (2002). *Supplemental Remedial Investigation Work Plan, Wacker Siltronic Corporation,, 7200 NW Front Avenue, Portland, Oregon.* March 7, 2002.

execution of the access agreement by BNSF. To date, NW Natural has had no response from representatives of BNSF. A letter of inquiry regarding the status of NW Natural's request for site access, prepared by Ms. Patty Dost of Schwabe, Williamson & Wyatt, P.C., was transmitted to representatives of BNSF on March 18, 2003. NW Natural has yet to receive a response.

A full reporting and evaluation of the results of NW Natural's investigatory activities will be included within the Phase I Site Characterization Summary Report and the Technical Memorandum on Source Control Measures, both of which are due to the ODEQ within 90 days after completion of the Phase I RI activities.

NW Natural understands that work plans and results of Wacker's own TCE-related investigation activities will be documented by Wacker and will be submitted independently by them to the DEQ.

Should you have any questions, please contact the undersigned.

Sincerely,

Robert Ede, R.G.
Associate

rede@hahnasoc.com

c: Mr. Bob Wyatt, NW Natural
Ms. Patty Dost, Schwabe, Williamson & Wyatt
Mr. Carl Stivers, Anchor Environmental, L.L.C.
Ms. Cathryn Young, Wacker Siltronic Corporation



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*** TX REPORT ***
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TRANSMISSION OK

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| TX/RX NO | 0313 |
| CONNECTION TEL | 95035987373 |
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| RESULT | OK |

WACKER SILTRONIC

**CATHRYN YOUNG**
SENIOR MANAGER
CENTRAL ENGINEERING

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cathryn_young@siltronic.com

# FAX

April 17, 2003

**To** Chris Reive
Jordan Schrader

**From** Cathryn Young

**Fax** 503-598-7373

3 Page(s) incl. coversheet

Hahn and Associates March 2003 Progress Report

# A PRELIMINARY REPORT
# SOIL INVESTIGATION FOR PROPOSED POLYSILICON PLANT

WACKER SILTRONIC CORPORATION
PORTLAND, OREGON

Prepared By

CH2M HILL NORTHWEST, INC.
2020 S.W. Fourth Avenue
Portland, Oregon 97201

Dept. of Environmental Quality
RECEIVED
JUL 24 1985
NORTHWEST REGION

JUNE 1985
P19786.A1.00

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# INTRODUCTION

Wacker Siltronic Corporation contracted CH2M HILL to conduct a soil investigation on Wacker's property located in the Northwest Industrial area of Portland, Oregon. The purpose of the investigation was to evaluate subsurface conditions within a section of the vacant portion of the site as part of the preliminary engineering for the design and construction of the proposed polysilicon plant.

The subsurface investigation was initiated based on the presence (both past and current) of industrial manufacturing and processing facilities within the Doane Lake area and recent environmental regulations--the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Resource Conservation and Recovery Act of 1976 (RCRA). Wacker was concerned that past or current management practices of industrial wastes within the Doane Lake area may have resulted in the presence of these materials or subsequent residues on Wacker's property, which would prevent or hinder the construction of the proposed polysilicon plant and future expansions of the existing manufacturing facilities.

This preliminary report describes the soil boring, sampling, and analytical procedures and construction of the groundwater monitoring wells. It also presents the results of the laboratory analyses, which indicate the presence of chemical constituents commonly associated with petroleum products, coal tar, and pesticides. Interpretation of the results presented in this report is beyond the scope of our contract and will be included as part of future work (i.e., site environmental assessment).



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## SITE DESCRIPTION

Wacker Siltronic Corporation is located in the northwest section of the City of Portland on the west bank of the Willamette River. The property, consisting of approximately 85 acres, is situated between the St. Johns Bridge and the Burlington Northern Railroad Bridge and is essentially rectangular in shape. Property boundaries are the Willamette River to the northeast; the Burlington Northern Railroad berm, which provides the approach to the railroad bridge, to the southwest; Burlington Northern track and adjacent N.W. St. Helens Road to the southwest; and the property line shared with Northwest Natural Gas and the Koppers Company to the northwest. Figure 1 shows the location of the Wacker property in relation to these landmarks and other industrial companies in the vicinity.

The project site is located in a vacant field about 400 feet south of Wacker's existing facilities, as shown in Figure 2. The site is bounded on the north by the existing Wacker plant, and is bordered on the south and east by Burlington Northern Railroad right-of-way. Underground utilities, consisting of oil, water, gasoline, natural gas, and sewer lines, as well as electric and telephone cables, are located in a 100-foot-wide easement on the north side of the site.

The site is relatively level with elevations ranging from about 40 feet National Geodetic Vertical Datum 1929 (NGVD) in the southern part to about 32 feet in the northern part. The local ground surface is deeply rutted with heavy machinery tracks and ditches. Wood debris, concrete, and other waste materials are present in small amounts across the field.

## FIELD INVESTIGATION

The field investigation was performed from April 1 through 5, 8 and 9, 1985. The investigation involved collecting soil



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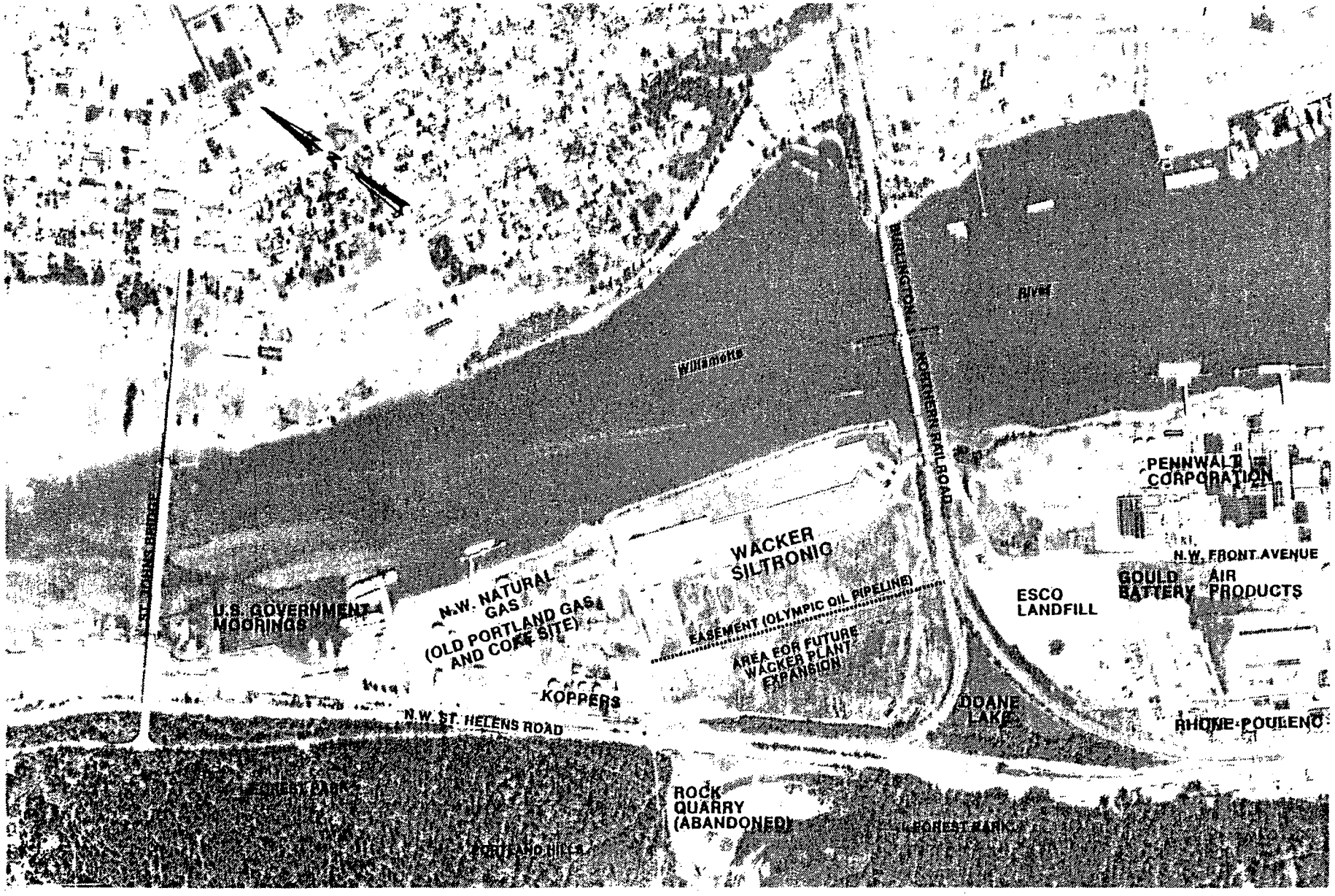


**Figure 1** **WACKER SILTRONIC PLANT AND SURROUNDING VICINITY (1983)**

SCALE: 1" = 940 FEET (1 cm : 110 m)

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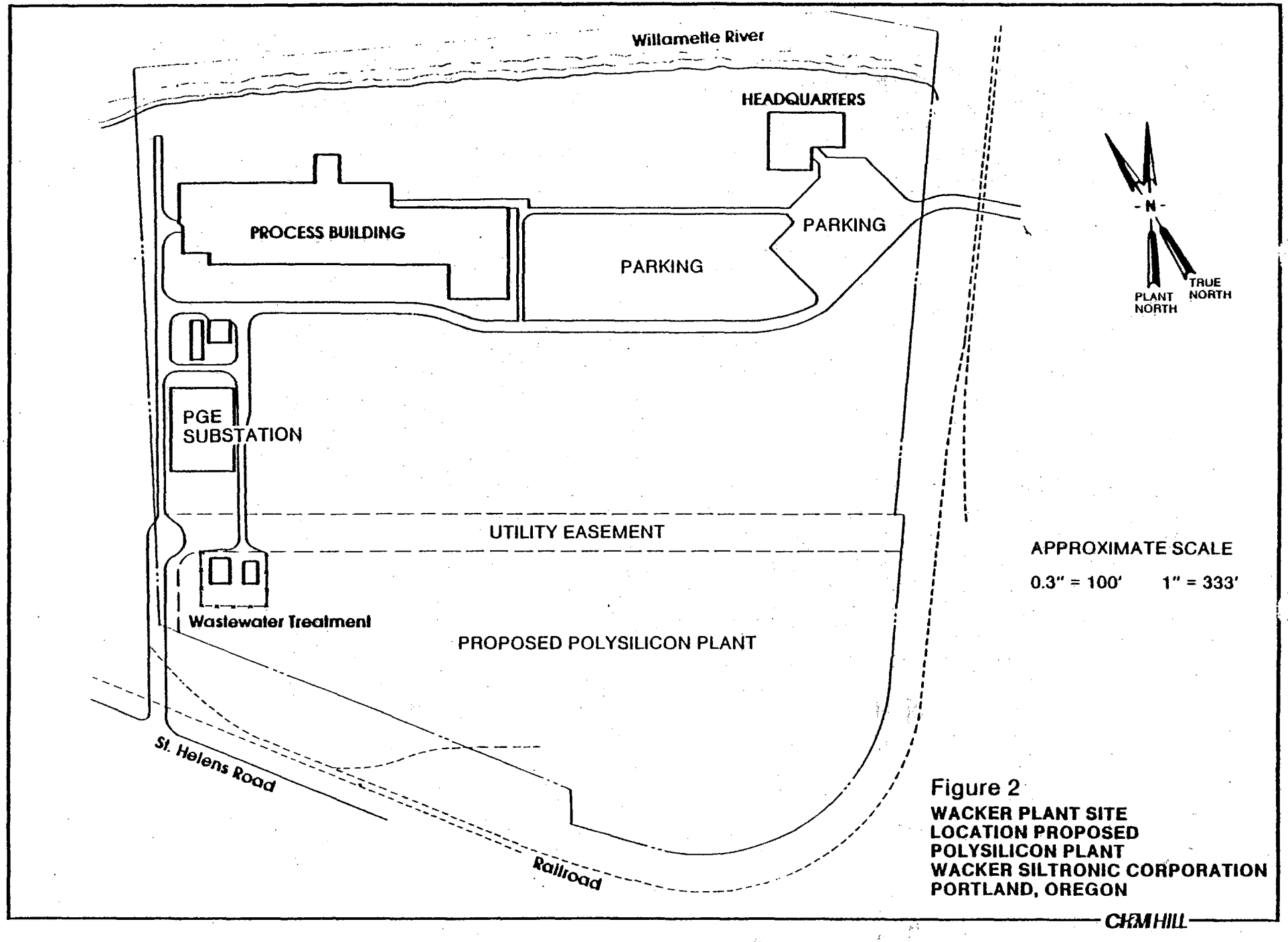


Figure 2
**WACKER PLANT SITE**
**LOCATION PROPOSED**
**POLYSILICON PLANT**
**WACKER SILTRONIC CORPORATION**
**PORTLAND, OREGON**

CH2M HILL

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samples from seven soil borings, all of which were completed as monitoring wells. The locations of the borings/monitoring wells (designated MW-1 through MW-7) are shown in Figure 3. The soil borings were drilled and monitoring wells constructed by Geotech Explorations, Inc., of Beaverton, Oregon, under the field observation of a CH2M HILL hydrogeologist.

## SOIL BORING AND SAMPLING

The seven soil borings were drilled using a CME-55 rotary drill rig and 6¼-inch (OD) hollow-stem augers. Soil samples were recovered at 5-foot intervals. Samples were recovered using a 2-inch split-spoon sampler following the requirements of the standard Penetration Test (ASTM D 1586). The sampler was driven 18 inches ahead of the auger bit to collect an undisturbed soil sample. The depth of soil borings ranged from 31.5 to 41.5 feet, generally between 5 and 20 feet below fill material and into native soils. The CH2M HILL hydrogeologist inspected, classified, and logged each borehole and soil sample in the field in approximate accordance with the Visual-Manual Procedure (ASTM D 2488). The log included a physical description of the soil type and a visual and odor estimate for the presence of contaminants. Sample intervals, soil types, and descriptions of the soil types and soil borings are provided in the soil boring record drawings presented in the appendix.

A composite soil sample from each split-spoon was placed in a clean 8-ounce glass jar. Each jar was filled to the top before it was sealed. The label that had been affixed to the sample container was then filled out. Information on the label included the facility name, the sample identification number, the name of the person collecting the sample, date and time of collection, and the location of the sample. The sample was then placed in a portable cooler until the end of each day when it was transferred via chain-of-custody record



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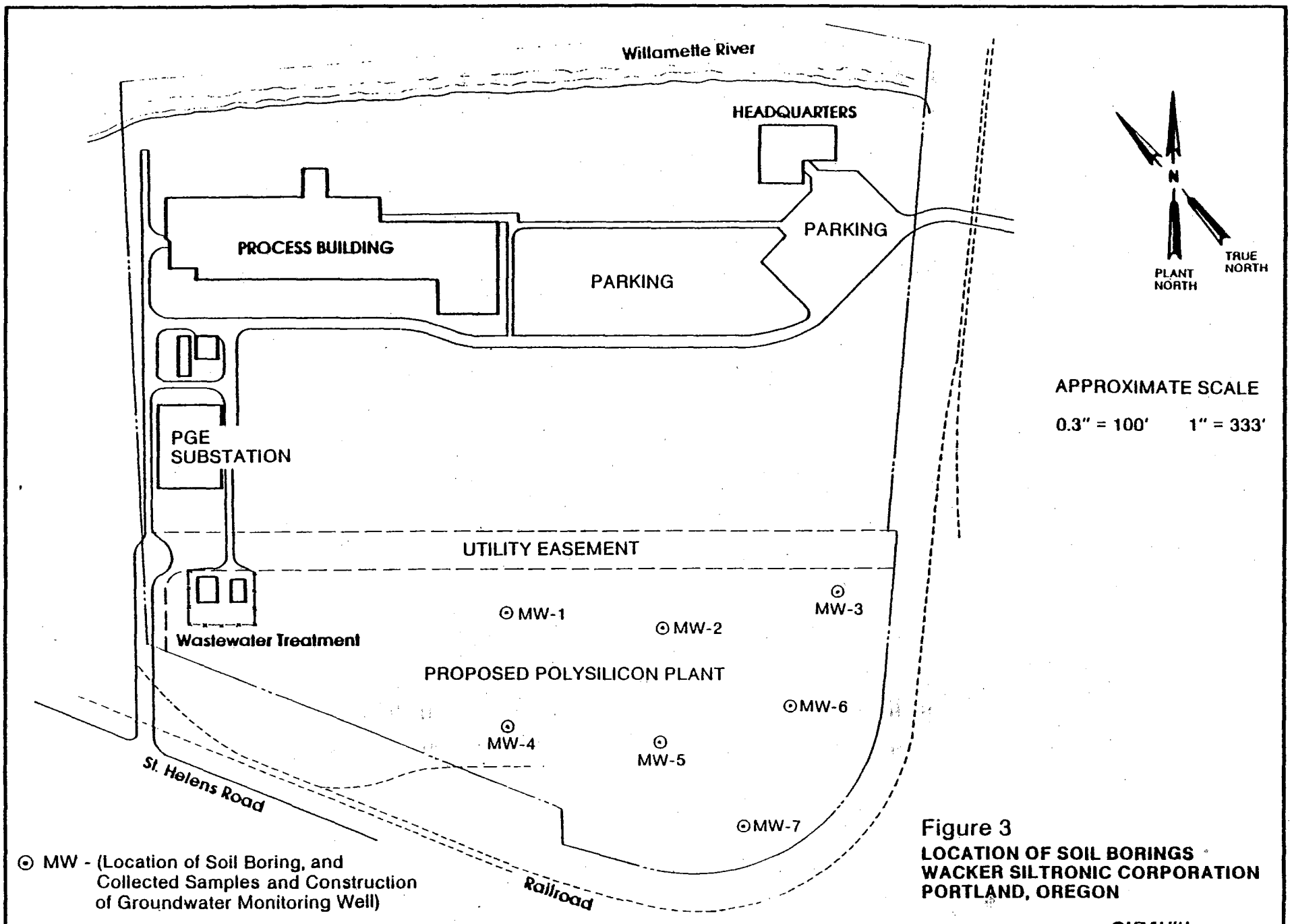


Figure 3
**LOCATION OF SOIL BORINGS**
**WACKER SILTRONIC CORPORATION**
**PORTLAND, OREGON**

CH2MHILL

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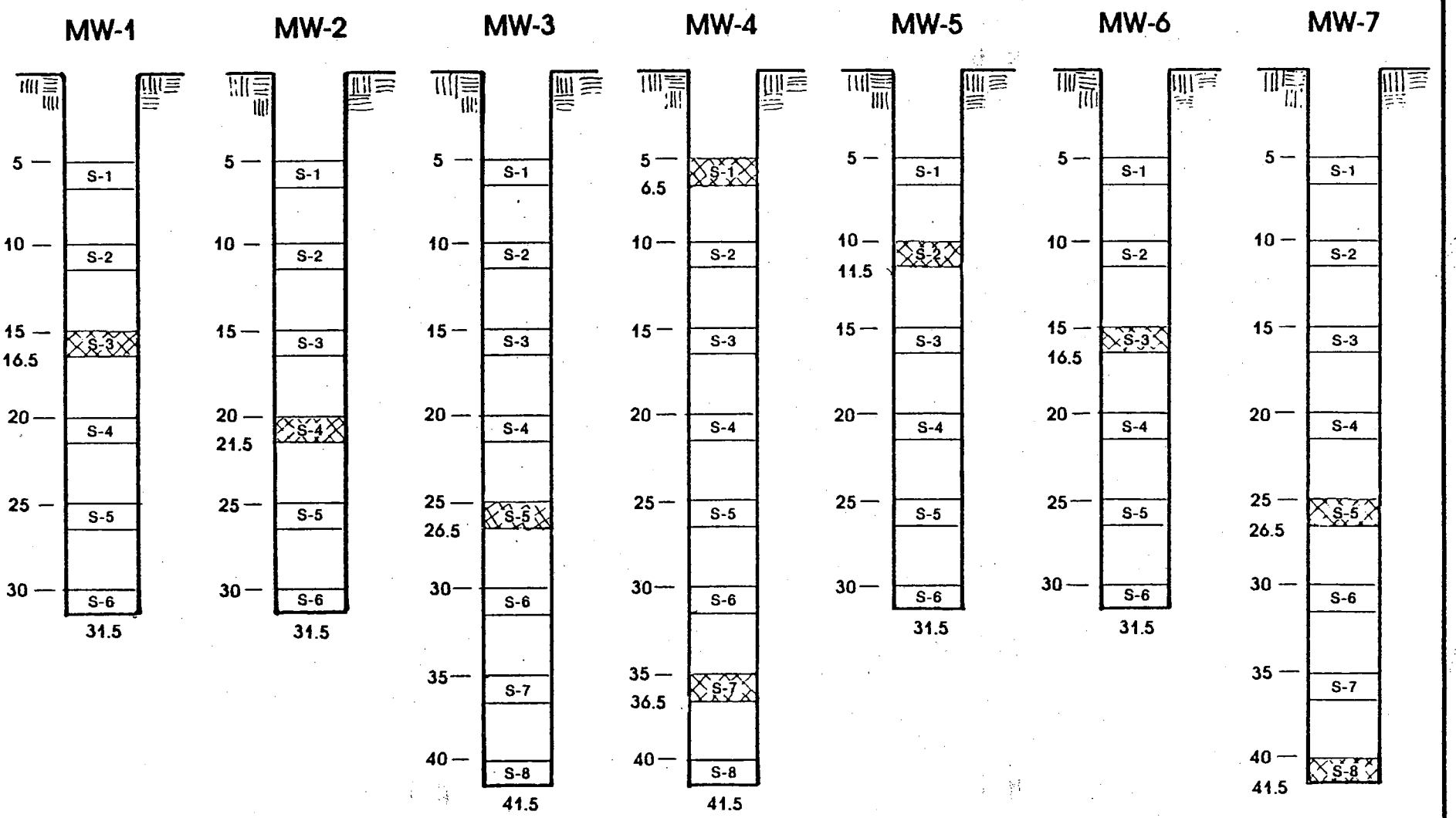


Analyzed Collected Soil Samples

(NOTE: Parallel lines denote soil samples. These were taken at 1.5 ft intervals starting every five feet)

Figure 4

**GENERAL VERTICAL LOCATION COLLECTED SOIL SAMPLES WACKER SILTRONIC CORPORATION PORTLAND, OREGON**

CH2MHILL

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pack material used for well construction were collected and saved.

## LABORATORY ANALYSIS AND SOIL SAMPLE RESULTS

The field sample description generally provided the basis for selecting samples to be sent to the laboratory for chemical analysis. Samples in which contaminants were most apparent visually and by odor were selected for analysis. Also, at least one soil sample from each soil boring site was analyzed, as was at least one sample at every 5-foot depth (except at 30 feet) from the combination of all soil boring locations. Figure 4 shows the approximate vertical location of the collected soil samples for each monitoring well and identifies which samples were analyzed.

The selection of the chemical analyses to be performed on each soil sample was based on the past and current industrial chemical manufacturing and handling activities within the Doane Lake area (i.e., petroleum products, coal tar, creosote, pesticides, battery recycling, foundry process waste disposal). The following chemical analyses were performed on the selected soil samples by Coffey Laboratories, Inc. (located at 4914 N.E. 122nd Avenue, Portland, Oregon):

- Oil and grease
- Phenols
- Volatiles and polynuclear aromatic hydrocarbons
- E.P. toxicity for:
  --pesticides
  --herbicides
  --arsenic
  --barium
  --cadmium
  --chromium
  --lead
  --mercury
  --selenium
  --silver



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## GROUNDWATER MONITORING WELL CONSTRUCTION

Seven groundwater monitoring wells were constructed by installing well screen casing assemblies into the completed drill holes.

Each assembly consisted of 2-inch diameter schedule 40 PVC. Well screens consisted of a 15-foot length of PVC with three rows of 0.010-inch machine-slotted openings. A 5-foot solid PVC sump was placed beneath each screen. Solid PVC casing was placed above the screen and extended to the ground surface. Casing lengths were connected by flush-threaded fittings; no solvents were used to connect PVC sections.

Each well screen interval was gravel-packed by pouring a coarse-grained sand into the annular space between the PVC and the hollow stem of the auger. As the auger was pulled up, the sand dropped out of the hollow stem into the well to envelop the well screen. After the sand pack was installed to 2 or 3 feet above the top of the well screen, the annular space between the PVC casing and the hollow stem was filled with 1 to 2 feet of pelletized bentonite followed by cement grout to the ground surface. A summary of the construction of each well is provided in the soil boring record drawings presented in the appendix.

Well heads were completed at approximately 2 feet above the ground surface with locking steel caps that were anchored 2 to 3 feet into the cement grout mixture. The monitoring wells were developed by the drilling contractor by blowing compressed air through an air line into the sump (tail pipe) located below the well screen. Development was considered complete when the return water became visibly less turbid. The PVC monitoring well assembly was thoroughly steam-cleaned before construction of each well. As a measure of additional quality assurance and control, samples of the sand filter



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to a refrigerator located inside the laboratory area of Wacker's wastewater treatment building. Chain-of-custody records were kept for every sample collected. Sample custody was maintained until the samples were relinquished directly to Wacker or an outside laboratory. A sample of the chain-of-custody form used is illustrated in the appendix.

All drilling equipment was thoroughly steam-cleaned before drilling each boring. Oil and grease were not used at drill rod connection fittings to prevent contamination of the soil samples. The split-spoon soil sampler was decontaminated between each use. Decontamination steps included:

- Washing off grass, soil particles, mud smears, etc., in a bucket of tap water
- Washing in a 5 to 10 percent solution of trisodium phosphate (TSP) and tap water
- Two rinses in clean tap water
- One rinse each with distilled water and methanol

The same decontamination procedures were used for the stainless steel utensils used to transfer soil from the sampler to the jars. Utensils were stored in a new plastic bag until they were ready for use.

A number of quality control measures were performed in order to ensure that all data generated was of known precision, and accuracy and conformed to accepted procedures. Soil sample splits were collected at soil boring sites MW-2, -5, and -6. Several transfer blanks were also prepared to check for potential contamination of sample jars. Samples of water poured into the drill holes to hold back heaving sands were also collected.



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The results of the laboratory analysis are presented in Table 1. A copy of the Coffey Laboratories, Inc., report is included in the appendix.

The field samples were analyzed for phenols, pesticides, herbicides, metals, volatiles, and aromatic hydrocarbons by EPA methods (SW-846, EPA-602, 4-79-020); the oils and grease were measured by standard methods (method 503 D).

Laboratory quality assurance procedures included method blanks, duplicates for precision measurements, and spikes for accuracy measurements. The frequency of blank, duplicate, and spike measurements was at a minimum of 10 percent per set to meet the standard requirements. The data were evaluated in view of the QC findings and found acceptable.

A review of the laboratory analysis indicates that each soil boring location contained a mixture of substances commonly associated with petroleum products, coal tar, and pesticides. The following list summarizes the principal substances found in each of the seven borings:

- MW-1 PAHs, petroleum products
- MW-2 PAHs, petroleum products
- MW-3 petroleum products
- MW-4 petroleum products
- MW-5 PAHs, petroleum products, 2,4-D
- MW-6 petroleum products, 2,4-D
- MW-7 petroleum products

Interpretation of results presented in Table 1 is beyond the scope of this report and will be included as part of future work (i.e., site environmental assessment).



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Table 1
WACKER SILTRONIC, POLYSILICON PLANT SOILS INVESTIGATION
SOURCE: COFFEY LABORATORIES, INC./APRIL 30, 1985
RESULTS OF SOILS ANALYSIS

| Chemical Compounds | MW-1, S-3 (15-16.5 ft) | MW-2, S-4 (20-21.5 ft) | MW-3, S-5 (25-26.5 ft) | MW-4, S-1 (5-6.5 ft) | MW-4, S-7 (35-36.5 ft) | MW-5, S-2 (10-11.5 ft) | MW-6, S-3 (15-16.5 ft) | MW-7, S-5 (25-26.5 ft) | MW-7, S-8 (40-41.5 ft) | Detection Limits | Reference Criteria |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Organic Analyses | | | | | | | | | | | |
| o Volatile Compounds | | | | | | | | | | | |
| 1,1,1-Trichloroethane | 0.01 | BD | BD | BD | BD | BD | BD | BD | BD | 0.01 | pp, PDW (*) |
| 1,2-Dichloroethane | BD | BD | BD | BD | BD | BD | BD | BD | BD | 0.01 | pp, PDW (*) |
| 1,1,2,2-Tetrachloroethylene | 2.2 | 11 | BD | BD | BD | 0.14 | BD | BD | BD | 0.05 | |
| Toluene | 1.2 | 20 | 0.11 | BD | BD | 0.20 | BD | BD | BD | 0.3 | pp |
| Chlorobenzene | 0.04 | BD | BD | BD | BD | BD | BD | BD | BD | 0.04 | pp |
| Ethyl-Benzene | 17 | 5.4 | BD | BD | BD | BD | BD | BD | 0.05 | 0.04 | pp |
| Xylene | 146 | 116 | BD | BD | BD | 1.5 | BD | 2.8 | 1.2 | 1.0 | |
| o Acid Extractables | | | | | | | | | | | |
| Phenol | 0.35 | 3.1 | 0.20 | 0.30 | 0.17 | 0.07 | 0.05 | 0.06 | 0.08 | NR | pp, SWQ |
| 2-Chlorophenol | ND | 7.8 | 0.08 | 0.26 | ND | ND | 0.13 | ND | 0.14 | NR | pp, SWQ |
| 2-Nitrophenol | ND | 0.20 | ND | ND | ND | ND | ND | ND | ND | NR | pp, SWQ |
| 2,4-Dimethylphenol | ND | 3.1 | ND | ND | ND | 0.22 | 0.17 | ND | ND | NR | pp, SWQ |
| 2,4-Dichlorophenol | ND | 2.7 | ND | ND | ND | 0.24 | ND | ND | ND | NR | pp, SWQ |
| 2,4,6-Trichlorophenol | ND | ND | ND | ND | ND | 0.22 | ND | ND | ND | NR | pp, SWQ |
| 2,4-Dinitrophenol | ND | ND | ND | ND | ND | 0.81 | ND | ND | ND | NR | pp, SWQ |
| Pentachlorophenol | ND | ND | ND | ND | 0.31 | 6.9 | 5.1 | ND | ND | NR | pp, SWQ, SHW |
| o Base Neutral Extractables | | | | | | | | | | | |
| Naphthalene | 6.7 | 360 | BD | BD | BD | 230 | BD | BD | BD | 1 | pp |
| Acenaphthalene | 5.6 | 230 | BD | BD | BD | 24 | BD | BD | BD | 1 | pp |
| Acenaphthene | 8.0 | 560 | BD | BD | BD | 28 | BD | BD | BD | 1 | pp |
| Fluorene | 5.0 | 290 | BD | BD | BD | 20 | BD | BD | BD | 1 | pp |
| Phenanthrine-Anthracene (***) | 32 | 1,400 | 3 | BD | BD | 150 | BD | 1.6 | BD | 1 | pp |
| Fluoranthene | 16 | 530 | BD | BD | BD | 50 | BD | 1.1 | BD | 1 | pp |
| Pyrene | 18 | 550 | BD | BD | BD | 57 | BD | 1.2 | BD | 1 | pp |
| Chrysene | 12 | 92 | BD | BD | BD | 36 | BD | 1.7 | BD | 1 | pp |
| Benzo (b) + Benzo (k) Fluoranthene (***) | 8 | 120 | BD | BD | BD | 200 | BD | BD | BD | 1 | pp |
| Benzo (a) pyrene | 19 | 120 | BD | BD | BD | 100 | BD | BD | BD | 1 | pp |
| Indeno (1,2,3-CD) Pyrene + Dibenzo (a,b) Anthracene (***) | BD | 270 | BD | BD | BD | 7 | BD | BD | BD | 1 | |
| Benzo (ghi) Perylene | BD | 360 | BD | BD | BD | 25 | BD | BD | BD | 1 | pp |
| o Pesticides (EP Toxicity) | | | | | | | | | | | |
| Gamma BHC (Lindane) | BD | BD | BD | BD | BD | BD | BD | BD | BD | 0.04 | pp, SHW, PDW |
| Endrin | BD | BD | BD | BD | BD | BD | BD | BD | BD | 0.002 | pp |
| Toxaphene | BD | BD | BD | BD | BD | BD | BD | BD | BD | 0.05 | pp |

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Table 1 (Continued)

| Chemical Compounds | MW-1, S-3 (15-16.5 ft) | MW-2, S-4 (20-21.5 ft) | MW-3, S-5 (25-26.5 ft) | MW-4, S-1 (5-6.5 ft) | MW-4, S-7 (35-36.5 ft) | MW-5, S-2 (10-11.5 ft) | MW-6, S-3 (15-16.5 ft) | MW-7, S-5 (25-26.5 ft) | MW-7, S-8 (40-41.5 ft) | Detection Limits | Reference Criteria |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Inorganic Analyses (EP Toxicity)** | | | | | | | | | | | |
| Arsenic | BD | BD | BD | BD | BD | BD | BD | BD | BD | 0.05 | pp,SHW,SWQ,PDW |
| Barium | 0.05 | 0.11 | 0.05 | 0.09 | BD | 0.05 | 0.11 | 0.08 | 0.15 | 0.05 | SHW, SWQ |
| Cadmium | BD | BD | BD | BD | BD | BD | BD | BD | BD | 0.05 | pp,SHW,SWQ,PDW |
| Chromium | BD | BD | BD | BD | BD | BD | BD | BD | BD | 0.05 | pp,SHW,SWQ,PDW |
| Lead | BD | BD | BD | BD | BD | BD | BD | BD | BD | 0.05 | pp,SHW,SWQ,PDW |
| Mercury | BD | BD | BD | BD | BD | BD | BD | BD | BD | 0.05 | pp,SHW,PDW |
| Selenium | BD | BD | BD | BD | BD | BD | BD | BD | BD | 0.05 | pp,SHW,PDW |
| Silver | BD | BD | BD | BD | BD | BD | BD | BD | BD | 0.05 | pp,SHW,PDW |
| **Miscellaneous Analysis** | | | | | | | | | | | |
| o non-PP Phenols/Cresols | | | | | | | | | | | |
| 3 & 4-Chlorophenol | 0.44 | 17.5 | 0.06 | ND | ND | 1.7 | 0.32 | ND | ND | NR | SHW, SWQ |
| 2,4,5-Trichlorophenol | ND | 1.9 | ND | ND | ND | ND | ND | ND | ND | NR | SHW, SWQ |
| 2,3,4,5-Tetrachlorophenol | 4.9 | 256 | ND | 0.40 | ND | 0.23 | 4.7 | 0.06 | 0.25 | NR | SHW, SWQ |
| 2,3,4,6-Tetrachlorophenol | 0.24 | ND | ND | ND | ND | ND | ND | 1.0 | ND | NR | SHW, SWQ |
| 2,3,5,6-Tetrachlorophenol | ND | 4.0 | ND | 0.58 | 0.11 | 0.33 | 0.55 | ND | 0.46 | NR | SHW, SWQ |
| o-Cresol | 0.04 | 3.4 | ND | 0.02 | ND | 0.19 | 0.05 | ND | ND | NR | |
| m- and p-Cresol (***) | 0.006 | ND | ND | 0.08 | ND | ND | ND | ND | ND | NR | |
| o Non-PP Pesticides (EP Toxicity) | | | | | | | | | | | |
| Methoxychlor | BD | BD | BD | BD | BD | BD | BD | BD | BD | 0.1 | SHW, PDW |
| 2,4-D | BD | BD | BD | BD | BD | 10.0 | 160.0 | BD | BD | 10 | SHW, PDW |
| 2,4,5-TP (Silvex) | BD | BD | BD | BD | BD | BD | BD | BD | BD | 1 | SHW, PDW |
| o Misc. Constituents/Parameters | | | | | | | | | | | |
| Oil and Grease | 0.340% | 0.1498% | 0.0587% | 0.914% | 0.0304% | 0.190% | 0.0539% | 0.0650% | 0.0586% | | |

Unless otherwise specified, all units are mg/kg (mg/L).

| | |
|---|---|
| pp | Priority Pollutant |
| PDW | National Interim Primary Drinking Water Regulations |
| PDW(*) | Proposed N.I.P.D.W.R. |
| SHW | State of Oregon Hazardous Waste Administrative Rules |
| SWQ | State of Oregon Water Quality Administrative Rules |
| BD | Parameter detected, but below analytical quantification limits. |
| ND | Analyzed, but not detected. |
| NR | Not reported. |
| (***) | Reported as sum of two compounds. |



SCOEPA00010676

COFFEY LABORATORIES, INC.
4914 N.E. 122nd Ave.
Portland, OR 97230
Phone: (503) 254-1794

April 30, 1985
Log #A850410-I

Wacker Siltronics
P.O. Box 03180
Portland, Oregon 97203

Analyses Requested: Oil and Grease, Phenols, Volatiles, and Polynuclear Aromatic Hydrocarbons

Sample Identifications:
#1 - MW1, S-3 (15.0' - 16.5')
#2 - MW2, S-4 (20.0' - 21.5')
#3 - MW3, S-5 (25.0' - 26.5')
#4 - MW4, S-1 (5.0' - 6.5')
#5 - MW4, S-7 (35.0' - 36.5')
#6 - MW5, S-2 (10.0' - 11.5')
#7 - MW6, S-3 (15.0' - 16.5')
#8 - MW7, S-5 (25.0' - 26.5')
#9 - MW7, S-8 (40.0' - 41.5')

| SAMPLE # | OIL AND GREASE |
|---|---|
| #1 | 0.340 % |
| #2 | 0.1498 % |
| #3 | 0.0587 % |
| #4 | 0.0914 % |
| #5 | 0.0304 % |
| #6 | 0.190 % |
| #7 | 0.0539 % |
| #8 | 0.0650 % |
| #9 | 0.0586 % |

THIS REPORT CONTINUES

COFFEY LABORATORIES, INC.
4914 N.E. 122nd Ave.
Portland, OR 97230
Phone: (503) 254-1794



PHENOL RESULTS

| ANALYSIS | SAMPLE #1 RESULTS |
|---|---|
| Phenol | 0.35 |
| O-Cresol | 0.04 |
| 3 & 4 Chlorophenol | 0.44 |
| 2,3,4,6 Tetrachlorophenol | 0.24 |
| 2,3,4,5 Tetrachlorophenol | 4.9 |
| M & P Cresol | 0.006 |

| | SAMPLE #2 RESULTS |
|---|---|
| Phenol | 3.1 |
| O-Cresol | 3.4 |
| 3 & 4 Chlorophenol | 17.5 |
| 2-Chlorophenol | 7.8 |
| 2-Nitrophenol | 0.20 |
| 2,4 Dimethylphenol | 3.1 |
| 2,4 Dichlorophenol | 3.7 |
| 2,4,5 Trichlorophenol | 1.9 |
| 2,3,5,6 Tetrachlorophenol | 4.0 |
| 2,3,4,5 Tetrachlorophenol | 256 |

| | SAMPLE #3 RESULTS |
|---|---|
| Phenol | 0.30 |
| 3 & 4 Chlorophenol | 0.06 |
| 2-Chlorophenol | 0.08 |

| | SAMPLE #4 RESULTS |
|---|---|
| Phenol | 0.30 |
| 2-Chlorophenol | 0.26 |
| O-Cresol | 0.02 |
| M & P Cresol | 0.08 |
| 2,3,5,6 Tetrachlorophenol | 0.59 |
| 2,3,4,5 Tetrachlorophenol | 0.40 |

| | SAMPLE #5 RESULTS |
|---|---|
| Phenol | 0.17 |
| 2,3,5,6 Tetrachlorophenol | 0.11 |
| Pentachlorophenol | 0.31 |

Results reported in ng/kg

THIS REPORT CONTINUED

COFFEY LABORATORIES, INC.
4914 N.E. 122nd Ave.
Portland, OR 97230
Phone: (503) 254-1794

Wacker Siltronics
Log #A850410-I

April 30, 1985
Page Three

PHENOL RESULTS

| ANALYSIS | SAMPLE #6 RESULTS |
|---|---|
| Phenol | 0.07 |
| O-Cresol | 0.19 |
| 2,4 Dimethylphenol | 0.22 |
| 2,4 Dichlorophenol | 0.24 |
| 3 & 4 Chlorophenol | 1.7 |
| 2,4,6 Trichlorophenol | 0.22 |
| 2,3,5,6 Tetrachlorophenol | 0.33 |
| 2,3,4,5 Tetrachlorophenol | 0.23 |
| 2,4 Dinitrophenol | 0.81 |
| Pentachlorophenol | 6.9 * |

| | SAMPLE #7 RESULTS |
|---|---|
| Phenol | 0.05 |
| O-Cresol | 0.05 |
| 2-Chlorophenol | 0.13 |
| 2,4 Dimethylphenol | 0.17 |
| 3 & 4 Chlorophenol | 0.32 |
| 2,3,5,6 Tetrachlorophenol | 0.55 |
| 2,3,4,5 Tetrachlorophenol | 4.7 |
| Pentachlorophenol | 5.1 |

| | SAMPLE #8 RESULTS |
|---|---|
| Phenol | 0.06 |
| 2,3,4,6 Tetrachlorophenol | 1.0 * |
| 2,3,4.5 Tetrachlorophenol | 0.06 |

| | SAMPLE #9 RESULTS |
|---|---|
| Phenol | 0.08 |
| 2-Chlorophenol | 0.14 |
| 2,3,5,6 Tetrachlorophenol | 0.45 |
| 2,3,4,5 Tetrachlorophenol | 0.25 |

Results reported in mg/Kg

THIS REPORT CONTINUED

SCOEPA00010679

COFFEY LABORATORIES, INC.
4914 N.E. 122nd Ave.
Portland, OR 97230
Phone: (503) 254-1794

Wacker Siltronics
Log #A850410-I

April 30, 1985
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## EP TOXICITY PESTICIDES

Results below apply to the water extract of soil samples. Water extracts performed as per EPA Specification of EP-Toxicity Method.

| SAMPLE # | ENDRIN | LINDANE | METHOXYCHLOR | TOXAPHENE |
|---|---|---|---|---|
| #1 | <0.002 | <0.04 | <0.1 | <0.05 |
| #2 | <0.002 | <0.04 | <0.1 | <0.05 |
| #3 | <0.002 | <0.04 | <0.1 | <0.05 |
| #4 | <0.002 | <0.04 | <0.1 | <0.05 |
| #5 | <0.002 | <0.04 | <0.1 | <0.05 |
| #6 | <0.002 | <0.04 | <0.1 | <0.05 |
| #7 | <0.002 | <0.04 | <0.1 | <0.05 |
| #8 | <0.002 | <0.04 | <0.1 | <0.05 |
| #9 | <0.002 | <0.04 | <0.1 | <0.05 |
| Allowed Limits | 0.02 | 0.4 | 10 | 0.5 |

< denotes "less than"

Results expressed in mg/liter

## EP TOXICITY HERBICIDES

| SAMPLE # | 2,4-D | 2,4,5 TP (SILVEX) |
|---|---|---|
| #1 | <10 (mg/liter) | <1 (mg/liter) |
| #2 | <10 | <1 |
| #3 | <10 | <1 |
| #4 | <10 | 1 |
| #5 | <10 | <1 |
| #6 | 10.0 | <1 |
| #7 | 190.0 | <1 |
| #8 | <10 | <1 |
| #9 | <10 | <1 |

THIS REPORT CONTINUED

COFFEY LABORATORIES, INC.
4914 N.E. 122nd Ave.
Portland, OR 97230
Phone: (503) 254-1794



Subject: E P Toxicity Test.

Method of Analysis: Federal Register/Vol.45, No.98/Monday, May 19, 1980/ Rules and Regulations; Appendix II, Page 33127

Field Data: Samples were collected and delivered by the Client

| ANALYSIS | #1 | #2 | #3 | #4 | #5 |
|---|---|---|---|---|---|
| Arsenic | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Barium | 0.05 | 0.11 | 0.05 | 0.09 | <0.05 |
| Cadmium | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Chromium | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Lead | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Mercury | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Selenium | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Silver | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |

| ANALYSIS | #6 | #7 | #8 | #9 | Limit |
|---|---|---|---|---|---|
| Arsenic | <0.05 | <0.05 | <0.05 | <0.05 | 5.0 |
| Barium | 0.05 | 0.11 | 0.09 | 0.15 | 100.0 |
| Cadmium | <0.05 | <0.05 | <0.05 | <0.05 | 1.0 |
| Chromium | <0.05 | <0.05 | <0.05 | <0.05 | 5.0 |
| Lead | <0.05 | <0.05 | <0.05 | <0.05 | 5.0 |
| Mercury | <0.05 | <0.05 | <0.05 | <0.05 | 0.2 |
| Selenium | <0.05 | <0.05 | <0.05 | <0.05 | 1.0 |
| Silver | <0.05 | <0.05 | <0.05 | <0.05 | 5.0 |

< denotes "less than"

Results expressed in mg/liter

THIS REPORT CONTINUED

COFFEY LABORATORIES, INC.
4914 N.E. 122nd Ave.
Portland, OR 97230
Phone: (503) 254-1794



VOLATILES (HEADSPACE ANALYSIS)

| COMPOUND | #1 | #2 | #3 | #4 | #5 |
|---|---|---|---|---|---|
| 1,2-Dichloro-ethane | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 1,1,1-Trichloro-ethane | 0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Toluene | 1.2 | 20 | 0.11 | <0.1 | <0.1 |
| 1,1,2,2 Tetra-chloroethylene | 2.2 | 11 | <0.05 | <0.05 | <0.05 |
| Chlorobenzene | 0.04 | <0.04 | <0.04 | <0.04 | <0.04 |
| Ethyl Benzene | 17.0 | 5.4 | <0.04 | <0.04 | <0.04 |
| Xylene | 146 | 116 | <1.0 | <1.0 | <1.0 |

| COMPOUND | #6 | #7 | #8 | #9 |
|---|---|---|---|---|
| 1,2-Dichloro-ethane | <0.01 | <0.01 | <0.01 | <0.01 |
| 1,1,1-Trichloro-ethane | <0.01 | <0.01 | <0.01 | <0.01 |
| Toluene | 0.20 | <0.1 | <0.1 | <0.1 |
| 1,1,2,2 Tetra-chloroethylene | 0.14 | <0.05 | <0.05 | <0.05 |
| Chlorobenzene | <0.04 | <0.04 | <0.04 | <0.04 |
| Ethyl Benzene | <0.04 | <0.04 | <0.04 | 0.05 |
| Xylene | 1.5 | <1.0 | 2.8 | 1.2 |

< denotes "less than"

Results reported in mg/Kg

Some interference was encountered due to naphthalene and some of the more volatile phenols and PNA s.

THIS REPORT CONTINUES

COFFEY LABORATORIES, INC.
4914 N.E. 122nd Ave.
Portland, OR 97230
Phone: (503) 254-1794

Wacker Siltronics
Log #A850410-I

April 30, 1985
Page Seven

POLYNUCLEAR AROMATIC HYDROCARBONS

| COMPOUND | #1 | #2 | #3 | #4 | #5 |
|---|---|---|---|---|---|
| Naphthalene | 6.7 | 360 | < 1 | < 1 | < 1 |
| Acenaphthalene | 5.6 | 230 | < 1 | < 1 | < 1 |
| Acenaphthene | 8.0 | 560 | < 1 | < 1 | < 1 |
| Fluorene | 5.0 | 290 | < 1 | < 1 | < 1 |
| Phenanthrine-Anthracene | 32 | 1400 | 3 | < 1 | < 1 |
| Fluoranthrene | 16 | 530 | < 1 | < 1 | < 1 |
| Pyrene | 18 | 550 | < 1 | < 1 | < 1 |
| Chrysene | 12 | 92 | < 1 | < 1 | < 1 |
| Benzo(b) + Benzo(k) Fluoranthrene | 8.0 | 120 | < 1 | < 1 | < 1 |
| Benzo(a)Pyrene | 19 | 120 | < 1 | < 1 | < 1 |
| Indeno(1,2,3-CD) Pyrene+Dibenzo (a,b)Anthracene | < 1 | 270 | < 1 | < 1 | < 1 |
| Benzo(ghi)-Perylene | < 1 | 360 | < 1 | < 1 | < 1 |

| COMPOUND | #6 | #7 | #8 | #9 |
|---|---|---|---|---|
| Naphthalene | 230 | < 1 | < 1 | < 1 |
| Acenaphthalene | 24 | < 1 | < 1 | < 1 |
| Acenaphthene | 28 | < 1 | < 1 | < 1 |
| Fluorene | 20 | < 1 | < 1 | < 1 |
| Phenanthrine-Anthracene | 150 | < 1 | 1.6 | < 1 |
| Fluoranthrene | 50 | < 1 | 1.1 | < 1 |
| Pyrene | 57 | < 1 | 1.2 | < 1 |
| Chrysene | 36 | < 1 | 1.7 | < 1 |
| Benzo(b)+Benzo(k) Fluoranthrene | 200 | < 1 | < 1 | < 1 |
| Benzo(a)Pyrene | 100 | < 1 | < 1 | < 1 |
| Indeno(1,2,3-CD Pyrene+Dibenzo (a,b)Anthracene | 7 | < 1 | < 1 | < 1 |
| Benzo(ghi)-Perylene | 25 | < 1 | < 1 | < 1 |

< denotes "less than"
Results reported in mg/kg

Sincerely,

Susan M. Coffey

Susan M. Coffey
President

SMC/db

SCOEPA00010683

CH2M HILL

| PROJECT NUMBER | BORING NUMBER | |
|---|---|---|
| P19436.A2 | MW-1 | SHEET 1 OF 2 |

# SOIL BORING RECORD DRAWING

PROJECT WACKER SILTRONIC CORPORATION LOCATION PORTLAND, OREGON

ELEVATION _____ DRILLING CONTRACTOR GEOTECH EXPLORATIONS, BEAVERTON, OREGON

DRILLING METHOD AND EQUIPMENT CME-55, 6" HS AUGERS

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER _____

| ELEVATION / DEPTH BELOW SURFACE (FT.) | SAMPLE: INTERVAL | SAMPLE: TYPE AND NUMBER | SAMPLE: RECOVERY | STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N) | SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL | SYMBOLIC LOG | COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION |
|---|---|---|---|---|---|---|---|
| 5 | 5.0 | | | | SILT, low plasticity, medium gray with brown mottling, moist, soft (ML), fill. | | Grout to surface<br>Top of bentonite at 2 1/2" |
| | 6.5 | S-1 | 18 | 1-1-1 (2) | | | Top of gravel at 5'<br>Screen top at 7' |
| 10 | 10.0 | | | | Upper 10" - SILT, same as S-1, some hydrocarbon odor (Jar 1 of 2), fill. | | Driller notes water at ±9'; |
| | 11.5 | S-2 | 0 | 4-4-5 (9) | Lower 8" - SAND, poorly graded, fine sand, dark gray, wet compact (SP), heavily saturated with oil, strong odor (Jar 2 of 2), fill. | | Prominent oily sheen and odor to cuttings between 10' and 15' |
| 15 | 15.0 | | | | SAND, poorly graded, fine sand, dark gray, wet, compact (SP), heavily saturated with oil, fill. | | |
| | 16.5 | S-3 | 18 | 3-4-5 (9) | | | |
| 20 | 20.0 | | | | SAND, same as S-3, heavily saturated with oil, fill. | | Screen bottom at 22' |
| | 21.5 | S-4 | 18 | 4-3-4 (7) | | | Driller notes 3 feet of heave at 25', had to wash out hole to clean out heave |
| 25 | 25.0 | | | | Upper 14" - SAND as in S-3 (SP), mild hydrocarbon odor, probably is slough from washing out heave and not representative. | | Fill<br>Native ±21' |
| | 26.5 | S-5 | 18 | 3-3-4 | Lower 4" - SILT, low plasticity, medium brownish gray, moist, firm (ML), no noticeable hydrocarbon odor, probably native soil. | | Sump bottom at 27' |

REV. 11-82 FORM D1668

SCOEPA00010684

CH2M HILL

| PROJECT NUMBER | BORING NUMBER | SHEET 2 OF 2 |
|---|---|---|
| P19436.A2 | MW-1 | |

# SOIL BORING RECORD DRAWING

PROJECT WACKER SILTRONIC CORPORATION LOCATION PORTLAND, OREGON

ELEVATION _____ DRILLING CONTRACTOR GEOTECH EXPLORATIONS, BEAVERTON, OREGON

DRILLING METHOD AND EQUIPMENT CME-55, 6" HS AUGERS

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER _____

| ELEVATION / DEPTH BELOW SURFACE (FT.) | SAMPLE: INTERVAL | SAMPLE: TYPE AND NUMBER | SAMPLE: RECOVERY | STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N) | SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL | SYMBOLIC LOG | COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION |
|---|---|---|---|---|---|---|---|
| 30 | 30.0 | | | | | | |
| | 31.5 | S-6 | 18 | 4-4-5 (9) | **SILT, low plasticity, medium brownish gray, moist to wet, includes some sandy silt in upper 6", firm (ML), no noticeable hydrocarbon odor, native soil.** | | **Bottom gravel at 31.5'** |
| | | | | | **END MW at 31.5 feet.** | | |

**Worst samples**

**S-2, Jar 2 of 2 and S-3 are equally bad, more sample in S-3 for testing.**

REV. 11-82 FORM D-1586

SCOEPA00010685

CH2M HILL

| PROJECT NUMBER | BORING NUMBER | |
|---|---|---|
| P19436.A2 | MW-2 | SHEET 1 OF 2 |

# SOIL BORING RECORD DRAWING

PROJECT **WACKER SILTRONIC CORPORATION** LOCATION PORTLAND, OREGON

ELEVATION _____ DRILLING CONTRACTOR GEOTECH EXPLORATIONS, BEAVERTON, OREGON

DRILLING METHOD AND EQUIPMENT CME-55, 6" HS AUGERS

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER _____

| ELEVATION | DEPTH BELOW SURFACE (FT.) | SAMPLE INTERVAL | SAMPLE TYPE AND NUMBER | SAMPLE RECOVERY | STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N) | SOIL DESCRIPTION: NAME GRADATION OR PLASTICITY PARTICLE SIZE DISTRIBUTION. COLOR MOISTURE CONTENT RELATIVE DENSITY OR CONSISTENCY SOIL STRUCTURE. MINERALOGY USCS GROUP SYMBOL | SYMBOLIC LOG | COMMENTS: DEPTH OF CASING. DRILLING RATE. DRILLING FLUID LOSS. TESTS AND INSTRUMENTATION |
|---|---|---|---|---|---|---|---|---|
| | 5 | 5.0 | | | | | | Grout to surface |
| | | 6.5 | S-1 | 18 | 1-2-3 (5) | SAND, poorly graded, fine sand, brown, moist, loose (SP), fill. | | Top of bentonite at 3'<br>Top of gravel at 4 1/2'<br>Screen top at 7 1/2'<br>Driller notes water at ±8'; |
| | 10 | 10.0 | | | | | | |
| | | 11.5 | S-2 | 0 | 1-4-5 | NO RECOVERY; sample tube came up oily, strong hydrocarbon odor, sandy material on outside of sampler. | | 15' screen<br>2" schedule 40<br>10 slot PVC |
| | 15 | 15.0 | | | | | | |
| | | 16.5 | S-3 | 18 | 1-1-2 (3) | SAND, poorly graded, fine sand, chalk gray, wet, loose (SP), some lenses of silt; strong hydrocarbon odor, oily material observed on sample fill. | | Driller notes considerabe degree of oiliness to cutting from 15'-25', more than in MW-1 |
| | 20 | 20.0 | | | | | | |
| | | 21.5 | S-4 | 18 | 5-6-6 (12) | SANDY SILT, non-plastic, ~30% fill sand, medium to dark gray, wet, firm, (ML), strong hydrocarbon odor, noticeable oil in sample fill? | | Screen bottom at 22'<br>5' sump |
| | 25 | 25.0 | | | | | | |
| | | 26.5 | S-5 | 18 | 3-5-5 (10) | Upper 14" - SAND, as in S-3, includes strong hydrocarbon odor and visible oil in sample, material may be slough from drilling and washing out heaved zone, may not be representative of 25'-26.5' interval.<br>Lower 4" - SILT, low plasticity, medium grayish brown, firm, moist (ML), no apparent hydrocarbon, native. | | Driller notes 2' heave at 25', had to wash out hole<br>Sump bottom at 27' 4" |

REV. 11/82 FORM D1686

SCOEPA00010686

CH2M HILL

| PROJECT NUMBER | BORING NUMBER | SHEET | OF |
|---|---|---|---|
| P19436.A2 | MW-2 | 2 | 2 |

# SOIL BORING RECORD DRAWING

PROJECT **WACKER SILTRONIC CORPORATION** LOCATION **PORTLAND, OREGON**

ELEVATION _____ DRILLING CONTRACTOR **GEOTECH EXPLORATIONS, BEAVERTON, OREGON**

DRILLING METHOD AND EQUIPMENT **CME-55, 6" HS AUGERS**

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER _____

| ELEVATION / DEPTH BELOW SURFACE (FT.) | SAMPLE: INTERVAL | SAMPLE: TYPE AND NUMBER | SAMPLE: RECOVERY | STANDARD PENETRATION TEST RESULTS: 6"-6"-6" (N) | SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL | SYMBOLIC LOG | COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION |
|---|---|---|---|---|---|---|---|
| 30 | | | | | | | |
| | 31.5 | S-6 | 18 | 3-3-4 (7) | **SILT, low plasticity, grayish brown, moist, firm (ML), no noticeable hydrocarbon odor, native soil.** | | |
| | | | | | **END MW at 31.5 feet** | | |
| | | | | | | | **Worst sample** |
| | | | | | | | **S-3, S-4 - about the same** |



SCOEPA00010687

CH2M HILL

| PROJECT NUMBER | BORING NUMBER | |
|---|---|---|
| P19436.A2 | MW-3 | SHEET 1 OF 2 |

# SOIL BORING RECORD DRAWING

PROJECT **WACKER SILTRONIC CORPORATION** LOCATION **PORTLAND, OREGON**

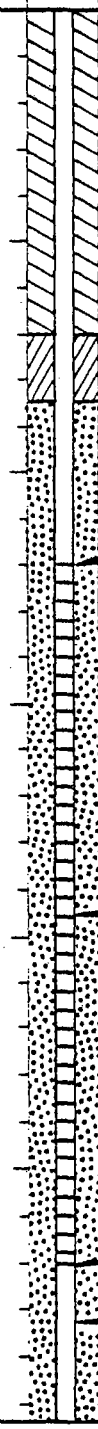
ELEVATION _____ DRILLING CONTRACTOR **GEOTECH EXPLORATIONS, BEAVERTON, OREGON**

DRILLING METHOD AND EQUIPMENT **CME-55, 6" HS AUGERS**

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER _____

| ELEVATION / DEPTH BELOW SURFACE (FT.) | SAMPLE: INTERVAL | SAMPLE: TYPE AND NUMBER | SAMPLE: RECOVERY | STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N) | SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL |
|---|---|---|---|---|---|
| 5 | 5.0 | | | | |
| | 6.5 | S-1 | 18 | 7-6-2 (8) | SAND, poorly graded, fine sand, ~15% fine, but some interlayers of silt, medium dense, dry, light brown, (SP), fill. |
| 10 | 10.0 | | | | |
| | 11.5 | S-2 | 18 | 2-2-7 (9) | Interbedded silt and sand, sand same as above (SP), except gray, SILT, low plasticity, 10-15% sand, odor, light gray, moist, firm (ML), fill. |
| 15 | 15.0 | | | | |
| | 16.5 | S-3 | 18 | 1-4-10 (14) | SAND, poorly graded, same as S-1, except strong hydrocarbon odor (SP), fill. |
| 20 | 20.0 | | | | |
| | 21.5 | S-4 | 18 | 4-4-7 (11) | Interbedded silt and sand, same as S-2, except includes partially decomposed wood fragments and mild to strong hydrocarbon odor, wet, gray, fill. |
| 25 | 25.0 | | | | |
| | 26.5 | S-5 | 18 | 5-6-6 (12) | SAND, poorly graded, fine sand, less than 10% fine, wet, medium to dark gray, compact (SP), strong hydrocarbon odor, fill. |
| 30 | 30.0 | | | | |

SYMBOLIC LOG



COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION

- Silty topsoil, then sandy cuttings to 5'
- Grout to surface
- Cuttins change to dark gray silt at ±7'
- 7' top of bentonite soil
- Top of sand pace 8 1/2'
- Screen top 12'
- Driller notes $H_20$ at ±15'
- First notice hydrocarbon odor in cutting at 15'
- 15' schedule 40 2" 10 slot PVC screen
- Screen bottom 27'
- 5'- 4" Sump

REV. 11-82 FORM D1556

SCOEPA00010688

CH2M HILL

| PROJECT NUMBER | BORING NUMBER | |
|---|---|---|
| P19436.A2 | MW-3 | SHEET 2 OF 2 |

# SOIL BORING RECORD DRAWING

PROJECT **WACKER SILTRONIC CORPORATION** LOCATION **PORTLAND, OREGON**

ELEVATION _____ DRILLING CONTRACTOR **GEOTECH EXPLORATIONS, BEAVERTON, OREGON**

DRILLING METHOD AND EQUIPMENT **CME-55, 6" HS AUGERS**

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER _____

| ELEVATION / DEPTH BELOW SURFACE (FT.) | SAMPLE: INTERVAL | SAMPLE: TYPE AND NUMBER | SAMPLE: RECOVERY | STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N) | SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL | SYMBOLIC LOG | COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION |
|---|---|---|---|---|---|---|---|
| | 31.5 | S-6 | 18 | 4-5-5 (10) | **SAND, poorly graded, fine sand, some interbedded silt in lower 2-4", medium gray, wet, medium dense, strong hydrocarbon odor, fill.** | | **Sump bottom at 32'- 4"** |
| | 35.0 | | | | | | **Bottom of fill at ±34 1/2'** |
| 35 | 36.5 | S-7 | 18 | 6-6-6 (12) | **Upper 14" - mixture of sand and silt, probably washed cavings.**<br>**Lower 4" - SILT, low plasticity, medium to dark gray, moist, firm (ML), slight hydrocarbon odor in upper 12", not noticeable in lower 6", sand and silt were mixed together in jar, silt is probably native soil.** | | **Augered to 35' and driller notes 3' of heave; opted to remove check ball from sampler and jet it to sample position in hopes of getting recovery; sample may be disturbed; pumped fresh water into hole (sample of water taken).** |
| | 40.0 | | | | | | |
| 40 | 41.5 | S-8 | 6" | 3-3-3 (9) | **Upper 12" - sand as in S-6, but is washed, probably is heaved material, discarded.**<br>**Lower 6" - SILT, low plasticity, medium to dark gray, moist, firm (ML), probably native soil, no noticeable hydrocarbon odor.** | | **Worst samples**<br>**Sample choices, any of S-3, S-4, S-5, S-6.** |

REV. 11-82 FORM D-1556

SCOEPA00010689

CH2M HILL

| PROJECT NUMBER | BORING NUMBER | |
|---|---|---|
| P19436.A2 | MW-4 | SHEET 1 OF 2 |

# SOIL BORING RECORD DRAWING

PROJECT **WACKER SILTRONIC CORPORATION** LOCATION PORTLAND, OREGON

ELEVATION _____ DRILLING CONTRACTOR GEOTECH EXPLORATIONS, BEAVERTON, OREGON

DRILLING METHOD AND EQUIPMENT CME-55, 6" HS AUGERS

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER _____

| ELEVATION | DEPTH BELOW SURFACE (FT.) | SAMPLE INTERVAL | SAMPLE TYPE AND NUMBER | SAMPLE RECOVERY | STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N) | SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY PARTICLE SIZE DISTRIBUTION, COLOR MOISTURE CONTENT RELATIVE DENSITY OR CONSISTENCY SOIL STRUCTURE, MINERALOGY USCS GROUP SYMBOL | SYMBOLIC LOG | COMMENTS: DEPTH OF CASING DRILLING RATE DRILLING FLUID LOSS TESTS AND INSTRUMENTATION |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Hole is within 20' of abandoned natural gas line |
| | | | | | | | | Grout 5' to surface |
| | 5 | 5.0 | | | | Upper 9" - SAND, poorly graded, fine sand, brown, moist to wet, loose (SP). | | Bentonite from 5'-6' |
| | | 6.5 | S-1 | 18 | 5-1-2 (3) | Lower 9" - SILT, non-plastic, 10-20% fine sand, dark gray, moist, soft (ML), fill. | | Screen top at 6 1/2' |
| | | | | | | | | Some gravel - like material at 8' |
| | | | | | | | | Driller notes water at ±8'; |
| | 10 | 10.0 | | | | Upper 6" - SAND, same as S-1, maybe slough. | | |
| | | 11.5 | S-2 | 18 | 11-13-11 (24) | Lower 12" - SILT, same as above. | | 15' screen 10 slot 2" schedule 40 PVC |
| | 15 | 15.0 | | | | SAND, poorly graded, fine sand, saturated, loose, (SP), maybe slough, possible mild odor of hydrocarbon. | | |
| | | 16.5 | S-3 | 6" | 3-3-4 (7) | | | Piece wood jammed into end of shoe |
| | 20 | 20.0 | | | | SILT, low plasticity, brownish gray, moist, firm, (ML), native soil; included pieces of wille, probably dragged into sample. | | Fill ±20' Native |
| | | 21.5 | S-4 | 18 | 1-4-4 (8) | | | Screen bottom at 21 1/2' |
| | | | | | | | | 5'- 4" Sump |
| | 25 | 25.0 | | | | SILT, same as above. | | |
| | | 26.5 | S.5 | 12 | 4-4-4 (8) | | | Tailpiece bottom at 27' |
| | | | | | | | | Bentonite from 27-28' |
| | | | | | | | | Gravel to 41 1/2' |
| | 30 | 30.0 | | | | | | |

REV. 11-82 FORM D1586

SCOEPA00010690

CH2M HILL

| PROJECT NUMBER | BORING NUMBER | SHEET 2 OF 2 |
|---|---|---|
| P19436.A2 | MW-4 | |

# SOIL BORING RECORD DRAWING

PROJECT **WACKER SILTRONIC CORPORATION** LOCATION PORTLAND, OREGON

ELEVATION _____ DRILLING CONTRACTOR GEOTECH EXPLORATIONS, BEAVERTON, OREGON

DRILLING METHOD AND EQUIPMENT CME-55, 6" HS AUGERS

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER _____

| ELEVATION / DEPTH BELOW SURFACE (FT.) | SAMPLE INTERVAL | SAMPLE TYPE AND NUMBER | SAMPLE RECOVERY | STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N) | SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL | SYMBOLIC LOG | COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION |
|---|---|---|---|---|---|---|---|
| | 31.5 | S-6 | 18 | 4-5-4 (9) | **SILT, low plasticity, gray with brown mottling, moist, firm (ML), includes some decomposed plant fragments.** | | |
| 35 | 35.0 | | | | | | |
| | 36.5 | S-7 | 8 | 2-3-8 (11) | **SANDY SILT, non-plastic, 30-50% fine sand, brown, moist, firm (ML).** | | Gravel to 41 1/2' |
| 40 | 40.0 | | | | | | |
| | 41.5 | S-8 | 8 | | **END MW at 41.5'** | | |

**Worst samples**

**None - all have clean appearance**



SCOEPA00010691

CH2M HILL

| PROJECT NUMBER | BORING NUMBER | |
|---|---|---|
| P19436.A2 | MW-5 | SHEET 1 OF 2 |

# SOIL BORING RECORD DRAWING

PROJECT **WACKER SILTRONIC CORPORATION** LOCATION **PORTLAND, OREGON**

ELEVATION _____ DRILLING CONTRACTOR **GEOTECH EXPLORATIONS, BEAVERTON, OREGON**

DRILLING METHOD AND EQUIPMENT **CME-55, 6" HS AUGERS**

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER _____

| ELEVATION / DEPTH BELOW SURFACE (FT.) | SAMPLE INTERVAL | SAMPLE TYPE AND NUMBER | SAMPLE RECOVERY | STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N) | SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL | SYMBOLIC LOG | COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION |
|---|---|---|---|---|---|---|---|
| 5 | 5.0 | | | | | | Grout to surface |
| | | | | | | | Top of bentonite seals = 2' |
| | | | | | | | Top of sand at 4' |
| | | | | | | | Screen top at 5' |
| | 6.5 | S-1 | 18 | 4-4-8 (12) | SAND, poorly graded, fine sands, brown and gray, some 1/2" silt lenses, moist, loose; includes some oil sheen and odor. | | Dark gray sandy material in cuttings from 5'-10', noticeable oily smell and sheen |
| 10 | 10.0 | | | | | | Driller notes water 5'-10' |
| | 11.5 | S-2 | 18 | 6-6-8 (14) | SAND, poorly graded, fine sand, dark gray, wet, loose to compact, (SP), fill, saturated with oil (split samples taken, Jar 1 and Jar 2). | | |
| 15 | 15.0 | | | | | | |
| | 16.5 | S-3 | 18 | | SAND, same as S-2, except only has oily odor and occassional sheen in soil. | | |
| 20 | 20.0 | | | | | | Screen bottom at 20' |
| | 21.5 | S-4 | 18 | 3-4-5 (9) | SAND, same as S-2, excet has mild odor of oil; silt in top. | | Silt in tip of sampler, for S-4 fill ±21 Native |
| 25 | 25.0 | | | | | | Sump bottom at 25' |
| | 26.5 | S-5 | 9 | 3-5-10 (15) | SILT, low plasticity, 10-15% fine sand, medium gray with brown, yellow and reddish mottling, slightly moist, very stiff (ML), no noticeable hydrocarbon odor. | | Tailpiece bottom at 25'-4" |
| 30 | 30.0 | | | | | | NOTE: Driller lost steel weight for tape in hole at 30 feet, not recovered. |



SCOEPA00010692

CH2M HILL

| PROJECT NUMBER | BORING NUMBER | SHEET | OF |
|---|---|---|---|
| P19436.A2 | MW-5 | 2 | 2 |

# SOIL BORING RECORD DRAWING

PROJECT **WACKER SILTRONIC CORPORATION** LOCATION PORTLAND, OREGON

ELEVATION _____ DRILLING CONTRACTOR GEOTECH EXPLORATIONS, BEAVERTON, OREGON

DRILLING METHOD AND EQUIPMENT CME-55, 6" HS AUGERS

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER _____

| ELEVATION / DEPTH BELOW SURFACE (FT.) | SAMPLE: INTERVAL | SAMPLE: TYPE AND NUMBER | SAMPLE: RECOVERY | STANDARD PENETRATION TEST RESULTS: 6"-6"-6" (N) | SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL | SYMBOLIC LOG | COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION |
|---|---|---|---|---|---|---|---|
| | 31.5 | S-6 | 18 | 4-5-5 (10) | **SILT, low plasticity, about 10% fine sand, gray with brown mottling, moist, stiff (ML), no noticeable hydrocarbon odor.**<br>**END MW at 31.5 feet.** | | **Worst samples**<br>**S-2 = worst**<br>**S-3** |

REV. 11-82 FORM D1556

SCOEPA00010693

CH2M HILL

| PROJECT NUMBER | BORING NUMBER | |
|---|---|---|
| P19436.A2 | MW-6 | SHEET 1 OF 2 |

# SOIL BORING RECORD DRAWING

PROJECT **WACKER SILTRONIC CORPORATION** LOCATION **PORTLAND, OREGON**

ELEVATION _____ DRILLING CONTRACTOR **GEOTECH EXPLORATIONS, BEAVERTON, OREGON**

DRILLING METHOD AND EQUIPMENT **CME-55, 6" HS AUGERS**

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER _____

| ELEVATION / DEPTH BELOW SURFACE (FT.) | SAMPLE: INTERVAL | SAMPLE: TYPE AND NUMBER | SAMPLE: RECOVERY | STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N) | SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL |
|---|---|---|---|---|---|
| 5 | 5.0 | | | | |
| | 6.5 | S-1 | 18 | 3-8-11 (19) | SAND, poorly graded, fine sand, less than 10% fine, brown, moist, compact (SP), fill. |
| 10 | 10.0 | | | | |
| | 11.5 | S-2 | 18 | 10-10-11 (21) | Primarily sand, as in S-1, but with several 1-inch silt layers; lower 6" of sample has strong hydrocarbon odor to it. |
| 15 | 15.0 | | | | |
| | 16.5 | S-3 | 18 | 1-1-2 (3) | SAND, as in S-1, except lower 6" have blackish discoloration and strong hydrocarbon odor; small oily splotches noticeable in soil. |
| 20 | 20.0 | | | | |
| | 21.5 | S-4 | 18 | 3-3-5 (8) | Upper 6" - SAND as in S-1, have blackish discoloration and hydrocarbon odor, fill. |
| | | | | | Lower 12" - SILT, low plasticity, gray with brown mottling, firm (ML), hydrocarbon odor not noticeable. |
| 25 | 25.0 | | | | |
| | 26.5 | S-5 | 18 | 9-26-26 (52) | SAND, as in S-1, but dark gray with mild hydrocarbon odor, material might be heaved sands and not representative of in-situ soil at 25'. |
| 30 | 30.0 | | | | |

SYMBOLIC LOG

COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION

- Grout to surface
- Bentonite to 6 1/2'
- Sand to 7 1/2'
- Top of screen at 9'
- Driller notes water at ±12', coincident with appearance of "oily" odor from cuttings while drilling from 10-15'
- A-rods came out of hold with unusual yellow discoloration from water at 20-25'
- Bottom of screen at 24'
- Driller notes 4' of heave after drilling to 25'; also, chain fell in hole, but was able to recover by retracting augers from hole; Augers moved during SPT from S-5, driller says no contact with sampler; why so high of an N value?
- Sump to 29 1/2'



SCOEPA00010694

CH2M HILL

| PROJECT NUMBER | BORING NUMBER | |
|---|---|---|
| P19436.A2 | MW-6 | SHEET 2 OF 2 |

# SOIL BORING RECORD DRAWING

PROJECT WACKER SILTRONIC CORPORATION LOCATION PORTLAND, OREGON

ELEVATION _____ DRILLING CONTRACTOR GEOTECH EXPLORATIONS, BEAVERTON, OREGON

DRILLING METHOD AND EQUIPMENT CME-55, 6" HS AUGERS

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER _____

| ELEVATION | DEPTH BELOW SURFACE (FT.) | SAMPLE INTERVAL | SAMPLE TYPE AND NUMBER | SAMPLE RECOVERY | STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N) | SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL | SYMBOLIC LOG | COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION |
|---|---|---|---|---|---|---|---|---|
| | | 31.5 | S-6 | 18 | 5-7-12 (19) | All 18" of soil in barrel is SAND, poorly graded, fine sand, less than 10% fine, medium to dark gray, wet, compact, (SP), probably heave or disturbed soil, not representative of 30' depth; mild hydrocarbon odor.<br><br>2" of soil in shoe of sampler is SANDY SILT, non-plastic, 30-50% fine sand, medium gray, wet, firm, (ML); no noticeable hydrocarbon odor, sandy silt is probably representative of in-situ soil. | | Driller notes 3' of heave from 30-29' prior to sampling S-6; had to drill/wash out heave |
| | | | | | | | | Sample choices<br><br>S-3 |

REV. 11/82 FORM D1586

SCOEPA00010695

CH2M HILL

| PROJECT NUMBER | BORING NUMBER | SHEET 1 OF 2 |
|---|---|---|
| P19436.A2 | MW-7 | |

# SOIL BORING RECORD DRAWING

PROJECT **WACKER SILTRONIC CORPORATION** LOCATION **PORTLAND, OREGON**

ELEVATION _____ DRILLING CONTRACTOR **GEOTECH EXPLORATIONS, BEAVERTON, OREGON**

DRILLING METHOD AND EQUIPMENT **CME-55, 6" HS AUGERS**

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER _____

| ELEVATION / DEPTH BELOW SURFACE (FT.) | SAMPLE: INTERVAL | SAMPLE: TYPE AND NUMBER | SAMPLE: RECOVERY | STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N) | SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL | SYMBOLIC LOG | COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION |
|---|---|---|---|---|---|---|---|
| 5 | 5.0 | | | | | | Grout to surface |
| | 6.5 | S-1 | 12" | 1-3-1 (4) | Lower 6" - SILT, low plasticity, moist, gray, soft (ML). Upper 6" - SAND, poorly graded, fine sand, brown, wet, loose, (SP), fill. | | 5 1/2' top of bentonite |
| | | | | | | | Cavings around PVC 7-15' |
| 10 | 10.0 | | | | | | 10' of top of screen |
| | 11.5 | S-2 | 14 | 5-8-11 (19) | SAND as in upper 6" of S-1, (SP), fill. | | Driller notes water at ±12' |
| | | | | | | | 15' section 10 slot PVC wells |
| 15 | 15.0 | | | | | | |
| | 16.5 | S-3 | 18 | 2-1-5 | SAND, same as upper 6" of S-1 (SP), fill. | | During well construction, drill hole walls began squeezing in at 5' up to 7', sand was packed in auger and walls apparently squeezed in faster than sand could drop out; tried twice unsuccessfully to jet-out sand. |
| | | | | | | | Fill ± Native |
| 20 | 20.0 | | | | | | |
| | 21.5 | S-4 | 18 | 5-5-6 (11) | Upper 6" - sand as in upper 6" of S-1, (SP), fill; mild hydrocarbon odor. Lower 12" - SILT, low plasticity, medium brown with gray mottling, moist, firm, (ML); native soil. | | |
| 25 | 25.0 | | | | | | 25' bottom screen |
| | 26.5 | S-5 | 18 | 4-3-4 (7) | Upper 9" - SILT, low plasticity, medium brown with gray mottling, moist, firm, (ML). Lower 9" - SAND, poorly graded, fine sand, medium gray, wet, loose, (SP), strong hydrocarbon odor, visible blotches of oil (?) in both silt and sand. | | 5' - 4" Sump |
| | | | | | | | Bottom of Sump = 30' |
| 30 | 30.0 | | | | | | Driller notes heave at 30' ±4' of heave |

REV 11 92 FORM D1556

SCOEPA00010696

CH2M HILL

| PROJECT NUMBER | BORING NUMBER | |
|---|---|---|
| P19436.A2 | MW-7 | SHEET 2 OF 2 |

# SOIL BORING RECORD DRAWING

PROJECT **WACKER SILTRONIC CORPORATION** LOCATION PORTLAND, OREGON

ELEVATION _____ DRILLING CONTRACTOR GEOTECH EXPLORATIONS, BEAVERTON, OREGON

DRILLING METHOD AND EQUIPMENT CME-55, 6" HS AUGERS

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER _____

| ELEVATION | DEPTH BELOW SURFACE (FT.) | SAMPLE INTERVAL | SAMPLE TYPE AND NUMBER | SAMPLE RECOVERY | STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N) | SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL | SYMBOLIC LOG | COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION |
|---|---|---|---|---|---|---|---|---|
| | | 31.5 | S-6 | 18 | 2-1-2 (3) | Lower 9" - SAND, poorly graded, fine, brown, wet, soft, (SP),. Upper 9" - SAND, very fine, brown, wet, loose, (SM); All has definite hydrocarbon (?) odor, not visible in soil, however. Sample may be distrubed, heave material. | | Reamed out heaved area from 26 to 30' with wash water and tricone bit to clear auger. Backfill to 32'-4" |
| | 35 | 35.0 | | | | | | |
| | | 36.5 | S-7 | 18 | 3-5-5 (10) | SANDY SILT, low plasticity, 20-30% fine sand, medium brown, moist, soft, (ML); noticeable hydrocarbon (?) odor. | | |
| | 40 | 40.0 | | | | Upper 7" - SILT, low plasticity, brown, wet, firm, (ML). | | |
| | | 41.5 | S-8 | 14" | 8-11-17 (28) | Lower 7" - SILTY SAND, fine sand, about 30% fine, brown, wet, compact, (SM); both silt and sand have noticeable hydrocarbon (?) odor, no visible traces. | | |
| | | | | | | END MW at 41.5 feet | | |

Sample choices

(Ranked from worst)

*S-5
S-6
S-7 - S-8 (about the same)

*amount of odor

REV. 11/82 FORM D1586

SCOEPA00010697

**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL CONSULTANTS

February 14, 2003

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland OR 97201-4987

HAI Project No. 5237

SUBJECT: January 2003 Progress Report for Remedial Investigation (RI) Activities, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. Blischke:

Hahn and Associates, Inc. (HAI) has prepared this Progress Report summarizing RI work activities conducted by NW Natural that have occurred relating to the Wacker Siltronic Corporation (Wacker) property during the month of January 2003. RI field activities for the site are being conducted as per the approved *Final Focused Remedial Investigation (RI) Work Plan*[1] (RI Work Plan), as well as the approved *Supplemental RI Work Plan* [2]. This Progress Report has been prepared as per an Order (DEQ No. ECVC-NWR-00-27) issued jointly to both NW Natural and Wacker by the Oregon Department of Environmental Quality (DEQ), dated October 4, 2000. As per the referenced Order, monthly progress reports are to be prepared by the 15th day of each month, with the reporting to continue for the duration of the project.

**Summary of Activities in January 2003**

During January 2003, NW Natural initiated preparation of the Phase I Site Characterization RI Summary Report documenting investigatory activities completed by NW Natural as part of RI activities completed to date. With the exception of awaiting site access, as described below, no further RI activities related to the Wacker property were conducted by NW Natural during the month of January.

**Anticipated / Completed Activities in January and February 2003**

The only remaining RI data collection task to be completed at the site involves an inspection and survey of the base of the drainage ditch located on BNSF property immediately west and south of the Wacker property. Initiation of this task will require receipt of access approval from BNSF, the owner of the right-of-way through which the ditch runs. A proposed access agreement has been reviewed and approved by NW Natural. NW Natural is presently awaiting approval and execution of the access agreement by BNSF.

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[1] Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1, 2001.

[2] Hahn and Associates, Inc. (2002). *Supplemental Remedial Investigation Work Plan, Wacker Siltronic Corporation,, 7200 NW Front Avenue, Portland, Oregon.* March 7, 2002.

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A full reporting and evaluation of the results of NW Natural's investigatory activities will be included within the Phase I Site Characterization Summary Report and the Technical Memorandum on Source Control Measures, both of which are due to the ODEQ within 90 days after completion of the Phase I RI activities.

NW Natural understands that work plans and results of Wacker's own TCE-related investigation activities will be documented by Wacker and will be submitted independently by them to the DEQ.

Should you have any questions, please contact the undersigned.

Sincerely,

Robert Ede, R.G.
Associate

rede@hahnasoc.com

c: Mr. Bob Wyatt, NW Natural
Ms. Patty Dost, Schwabe, Williamson & Wyatt
Mr. Carl Stivers, Anchor Environmental, L.L.C.
Ms. Cathryn Young, Wacker Siltronic Corporation



SCOEPA00010699

WACKER SILTRONIC

**CATHRYN YOUNG**
SENIOR MANAGER
CENTRAL ENGINEERING

**Wacker Siltronic Corporation**
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Tel. 503-219-7406
Fax 503-219-7599
cathryn_young@siltronic.com

# FAX

February 19, 2003

**To** Chris Reive
Jordan Schrader

**From** Cathryn Young

**Fax** 503-598-7373

3 Page(s) incl. coversheet

HAI letter of February 19, 2003
January 2003 Progress Report

WACKER SILTRONIC

**CATHRYN YOUNG**
SENIOR MANAGER
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**Wacker Siltronic Corporation**
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December 24, 2003

Mr. Matt McClincy
Oregon Department of Environmental Quality
2020 SW 4th Avenue, Suite 400
Portland, Oregon 97201-4987

Reference: Phase I Site Characterization Summary Report, Wacker Property, Hahn and Associates, Inc., November 2003 and Preliminary Source Control Report, Anchor Environmental, LLC, November 2003

Dear Matt:

Enclosed for your consideration are review comments prepared for Wacker by its consultant, Maul Foster Alongi, on the above-referenced reports.

Sincerely,

WACKER SILTRONIC CORPORATION

Cathryn Young
Senior Manager
Environmental Affairs

cc: Rod Struck
Chris Reive
Tom McCue

MAUL FOSTER ALONGI
ENVIRONMENTAL & ENGINEERING CONSULTANTS

PORTLAND, OREGON
SEATTLE, WASHINGTON
VANCOUVER, WASHINGTON

December 22, 2003
Project 8128.01.07

Ms. Cathryn Young
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon 97210

Re: Review of November 2003 Hahn and Associates, Inc. *Phase I Site Characterization Summary Report* and *Preliminary Source Control Evaluation Report*

Dear Cathryn:

At your request, Maul Foster & Alongi, Inc. (MFA) has reviewed the above-referenced reports prepared by Hahn and Associates, Inc. (HAI) and Anchor Environmental, respectively, for Northwest Natural (NWN). NWN retained HAI to complete a remedial investigation (RI) at the Wacker Siltronic Corporation (Wacker) property located at 7200 NW Front Avenue, Portland, Oregon. The RI activities on the Wacker property are required by a DEQ Order issued jointly to NWN and Wacker (DEQ No. ECVC-NWR-00-27).

## PHASE 1 SITE CHARACTERIZATION REPORT

### General Comments

The Site Characterization Report is inadequate for at least the following reasons:

- It does not satisfy the requirements of Section 5 and Attachment B of the Order for a Remedial Investigation (RI).
- It limits the scope of work for the Source Control Evaluation by understating the nature and extent of manufactured gas plant (MGP) related impacts to the Wacker property.
- It does not adequately describe the coal gasification processes, hazardous substances used, and wastes generated during the process. Therefore, the adequacy of source area characterization can not be determined.
- It ignores significant contamination that extends to a depth of at least 50 feet below ground surface in the area of Fab 1.



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Other deficiencies or omissions of consequence include:

- MFA's evaluation of historical aerial photographs and other data show that MGP wastes may be extensive in the subsurface in the southern part of Wacker's property. Very little characterization has been completed in the southern portion of Wacker's property and the distribution of MGP related waste and hazardous substances are not adequately defined.

- Wacker's April 5, 2001 letter to Mr. Blischke of DEQ outlined several concerns that it believed would be addressed by a focused RI. These concerns have not been addressed in the Site Characterization Report.

Additional analytical data now available as a result of Wacker's recent groundwater assessment activities will be submitted under separate cover for your review and should be incorporated into any final Site Characterization Report or RI.

**Specific Comments – Phase I Site Characterization Report**

**Section 1.1.**

- HAI states that the RI scope of work required by the Order is limited to determination of the nature and extent of releases of hazardous substances to sediments. The RI scope of work as identified in Section 5 and Attachment B of the Order is not so limited; it specifically requires identification of the vertical and horizontal extent of soil and groundwater contamination, identification of hot spots, and assessment of human and ecological risk, plus other requirements. The Order's requirements for a complete RI have been previously noted by the DEQ in its letter to NWN dated June 26, 2001.

- HAI's declared objectives of the RI activities limits the scope of source characterization to "sources of identified ongoing unacceptable risk to Willamette River sediments". To the extent that limited purpose may have been approved by DEQ independent of the broader requirements of the Order, that goal has not been achieved, as is discussed below.

- HAI states that: "[a]s stipulated by the unilateral order, NW Natural and Wacker are *equally obligated* to perform characterization activities sufficient in scope to achieve the above cited objectives." (emphasis added). The Order contains no such stipulation

regarding equal obligation, nor does it stipulate that the characterization activities should only be sufficient to "achieve the above-cited objectives".

**Section 1.2.**

- The list of work items omits the obligation to interview Wacker personnel regarding their observations of soil and subsurface conditions during facility development and operation, as recommended in DEQ's September 9, 2003 letter to NWN and Wacker.

**Section 2.4.1**

This section inappropriately limits discussion of potential contaminant sources from the former PG&C Gasco facility. For example:

- HAI declares that "[a]erial photographs indicate that historical operations associated with oil gasification processes at the former PG&C Gasco site have *potentially* resulted in manufactured gas plant-related contamination at the Wacker site..." (emphasis added). MGP-related contamination at the Wacker site has been confirmed (the facility was placed on the Confirmed Release List in 1992) based on analytical data and should not be qualified as potential.

- The following important information is omitted, minimized or incomplete:

  - *Chemical characteristics of MGP-related wastes.* No identification of the individual constituents of MGP-related waste is provided, preventing an accurate characterization of the nature of potential sources on the Wacker property.
  - *Potential non-MGP-related contaminant sources that may have been disposed along with MGP-related waste.* This omission is significant because tetrachloroethylene (PCE) was detected in association with MGP-related constituents on both the Wacker and NWN properties. PCE degrades into trichloroethylene (TCE).
  - *Estimates of the volume of MGP-related waste released during the period of the operations of the former facility.* The omission is significant not only because MGP-related wastes have been found throughout the Wacker property, but also because the objectives of the RI as specified in Attachment B of the Order cannot be met without an estimate of the MGP-related waste volume. Satisfying the terms of the Order requires the description and incorporation of information related to oil gasification operations including the duration, characteristics, and associated disposal activities on the Wacker property. If no disposal records are available, a



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discussion of waste production rates throughout the operational life of the Gasco/NWN facilities should be used to provide an estimate of the volume of MGP-related waste disposed of on the Wacker property.

- *NAPL below the Surficial Water Bearing Zone (WBZ).* Oil-saturated soil was observed from 20 to 50 feet below ground surface in boring B-1-8. This NAPL zone should be identified as a contaminant source.
- *Reliance on the Strategy Recommendation (DEQ 1999) and the Supplemental Strategy Recommendation (Bridgewater 2000) for identification of potential contaminant sources.* Neither document was intended to be exhaustive or to satisfy the requirement of a more specific and targeted RI. The sole purpose of each document was to provide a summary description of the site background. HAI's investigation of waste materials disposed by Gasco and NWN is insufficient for the purposes of RI characterization and evaluation of risk to human health and the environment.

**Section 2.4.2.**

- Omits discussion of a pipeline that connected the PG&C facility with the former Western Transportation Terminal. The pipeline is specifically mentioned in the Strategy Recommendation (DEQ, 1999).

**Section 2.5.**

- Omits discussion of tetrachloroethylene (PCE) as a COI which was detected in soil at concentrations up to 11 milligrams per kilogram (mg/Kg) during investigation for the proposed polysilicon plant (CH2MHill, 1985), and in groundwater on NWN's property at concentrations up to 2 ug/L (MW-11). MFA's subsequent investigation found low PCE concentrations (less than 5 ug/L) in WS-11 (along the riverbank) and WS-13 (in the former UST area). Detections of PCE on the NWN and Wacker properties suggest that some fraction of known TCE contamination and its degradation products are the result of historical PCE use or disposal on either or both of the properties.

- HAI declares that it limited its list of COIs to those contaminants related to "historic PG&C operations". However, the report neglects to identify historic PG&C operations with respect to manufactured gas production and other operations that may have used solvents or other chemicals.

- HAI declares that metals in the sediments may be the result of mobilization from acid spills. MFA's interpretation of the available data does not support this claim (*see* section 5.3 of the report) and DEQ should critically evaluate HAI's conclusion in this regard (*see,* comment to Section 5.3 of the Report, below; see also, Wacker's letter to DEQ dated April 5, 2001).

- HAI does not identify the specific polynuclear aromatic hydrocarbons (PAHs) that are COIs. There are more than 100 individual PAHs.

**Section 3.7.**

- Estimates the hydraulic conductivity of fine-grained water bearing zones using slug tests in wells. This method of measuring hydraulic conductivity is often inaccurate due to the high contrast in conductivity between the filter pack surrounding the well and the aquifer material. As a result, the conclusions regarding the travel time estimates in the Source Control Evaluation Report are suspect.

**Section 4.0.**

- The statement that MFA submitted soil and groundwater samples for analysis of PAHs by EPA Method 8260B. MFA submitted soil and groundwater samples for analysis of PAHs by EPA Method 8270-SIM.

**Section 5.1.3.**

- Fails to identify the Columbia River Basalt (CRB) as an aquifer of regional significance.

**Section 5.2.**

- Assumes that the upper Silt Unit is laterally extensive across the site. This conclusion may be contradicted by concentrations of COIs observed in sampling data from significant depths.

- Assumes that the Willamette River forms a regional groundwater discharge boundary to the northeast, implying that all the groundwater within the fill unit and the alluvial unit discharges to the Willamette River. HAI did not present data supporting this statement.

- Identifies a downward vertical gradient between the Surficial WBZ and the Alluvial WBZ, which appears to indicate that the Surficial WBZ discharges to the Alluvial WBZ, which may discharge to the Willamette. However, later statements in this section are inconclusive regarding groundwater-surface water interactions. This reflects a lack of understanding of groundwater flow in the Surficial WBZ, which is heavily contaminated by MGP-related waste.

- HAI concludes that the Surficial WBZ and the Willamette River are hydraulically isolated to a degree, but draws no conclusion about the potential discharge of groundwater from the Surficial WBZ to the Willamette River. Since the Surficial WBZ is heavily contaminated, characterization of this groundwater to surface water pathway is warranted.

**Section 5.3.**

- Metals concentrations in soil and groundwater samples are noted as being relatively consistent at all sampling locations. This directly contradicts HAI's conclusion that relatively minor releases of acid during Wacker's operations have mobilized naturally-occurring metals in soil. (*See,* comment to section 2.5 of the Report, above)

**Section 5.3.4.**

- Limits the discussion of oil or tar to borings completed during the RI, and incorrectly states that there is no field screening evidence of oil or tar below the zone of the Surficial Fill unit. However, Table 17 identifies that soil between 20 and 50 feet below ground surface was saturated with oil. This oil-saturated zone is below the Surficial Fill Unit as identified on HAI's cross-section B-B'.

**Section 6.**

- Finding 3:

  - Assumes that MGP-related COIs are not present, or are attenuated, in the primary zone of groundwater transport (the Alluvial WBZ). This finding is contradicted by Wacker's recent field work and data.

  - Omits discussion of the potential for transport of MGP-related COIs in the Surficial WBZ towards the northwest drainage pond.

- Omits discussion of the potential for transport of MGP-related COIs from the Surficial WBZ to either the Willamette River or the underlying Alluvial WBZ.

- Finding 5 states that MGP-related wastes (oil or tar) have not been identified beneath the Surficial fill. This statement ignores and is directly contradicted by previous investigations on Wacker property (in boring B-1-8) and also in borings upgradient or cross-gradient of Wacker's property at depths up to 70 feet below ground surface (NWN boring B-33).

- Finding 6 omits discussion of the seepage observed during dredging in 1998 to repair damage from the 1996 flood. The seepage of product from the Surficial Fill unit to the Willamette River constitutes a direct discharge.

- The entire section omits the apparently complete contamination migration pathway based on the concentrations of MGP-related COIs in sediment. The detections in the harbor of LPAH and HPAH at levels up to 100x the Baseline Harbor levels should be considered evidence of a potentially complete groundwater transport pathway between the Surficial WBZ and the Willamette River sediments.

We also note that there is no Conceptual Site Model (CSM) developed in this Phase I report. A CSM is required to evaluate source areas and potential exposure pathways associated with environmental media at a site.

In general, the Phase I Site Characterization is not an adequate characterization of potential sources and does not provide an adequate or complete conceptual transport model between the heavily contaminated Surficial Fill Unit and the underlying Alluvial WBZ or the Willamette River.

## SOURCE CONTROL REPORT

The findings of the Phase I Site Characterization were combined with the findings from the Phase I Remedial Investigation Summary Report and Preliminary Analysis of Soil Data, NW Natural, Gasco Facility (HAI, 1998) to develop the conclusions in the Source Control Evaluation report. Because of the deficiencies noted in the Site Characterization Report noted above, we have strong reservations about the conclusions drawn in the Source Control Report. Our comments follow.

**General Comments**

- The Preliminary Source Control Report relies on the incomplete and potentially inaccurate information and conclusions presented in the Site Characterization Report. As such, the Source Control Evaluation report should be rejected by the DEQ until such time as adequate characterization of MGP impacts on Wacker's property is completed.

**Specific Comments**

**Section 2.3.**

- In spite of the low concentrations of metals in sediments, the report identifies metals (including chromium) as COIs for the Wacker site. This is based on the potential for acid-induced mobilization of naturally-occurring metals. This conclusion ignores that DEQ's strategy recommendation did not identify chromium as exceeding the Baseline Harbor concentration, and that the Supplemental Strategy Recommendation accurately identifies two potential explanations for the metals that were detected, neither of which includes acid-induced mobilization.

**Section 2.4.1.**

- Assumes that the Silt Unit is laterally extensive across the site. This conclusion relies on spatially-discrete boring observations, not on aquifer testing data. This ignores the potential for transport from the highly impacted Surficial WBZ to the Willamette River via the Alluvial WBZ. Because downward vertical gradients from the Surficial WBZ to the Alluvial WBZ have been measured on the Wacker property and were identified in the Phase I Site Characterization report, this assumption is not appropriate.

**Section 2.4.2**

- Omits reference to detections of oil and tar at depths below the Surficial Fill unit on the NWN property (and potentially upgradient of the Wacker property).

- Omits observations of sheens made during bank repair (following the 1996 flood).

- Concludes that ongoing NAPL migration to the river is not considered to be occurring, despite observations of sheens, and without adequate characterization of the lateral and vertical extent of NAPL in the Surficial Fill and Alluvial units. This Section appears to indicate that the NAPL migration pathway is incomplete, based on this erroneous conclusion.

**Section 3.3.1.**

- The evaluation of groundwater fate and transport is incomplete because it does not consider the potential connection between the Surficial WBZ and the Alluvial WBZ and therefore the Willamette River.

**Section 3.3.3.**

- The fate and transport estimates are incomplete because:
    - They do not consider impacts to properties such as sorption or solubility from additional chemicals. For example, the mobility of HPAHs may be increased by the presence of LPAHs or BTEX compounds (cosolvency effects). The sorption of LPAHs to aquifer materials will be less than the values shown in Tables 9 and 10 due to the high concentrations of HPAHs. Also, sorption of these organics is based on calculated distribution coefficients. The calculated distribution coefficients are based on an assumed fraction of organic carbon value (foc) which may not represent actual conditions. The foc value selected for this report is at the high end of observed values which could result in underestimation of migration.
    - The metals calculations do not address attenuation of concentrations through diffusion or dispersion.
    - The half-life values used to determine the likely concentrations of chlorinated organics at the shoreline are not site-specific and probably do not represent actual conditions. The half-life values selected from Howard et al. are overly conservative (i.e., will result in an overestimate of the distance migrated) and do not consider biodegradation effects. Biodegradation of TCE is unquestionably occurring in the Alluvial WBZ, based on the observed concentrations of cis-1,2-DCE and vinyl chloride. The half-life selected for vinyl chloride is based on anaerobic conditions, which were not consistently observed in the Alluvial WBZ, and is therefore inappropriate.
- In summary, it is likely that migration of LPAHs and HPAHs are underestimated and the migration of chlorinated VOCs are overestimated.



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**Section 4.**

- Omits discussion of the significance of the observed high concentration of HPAHs and LPAHs detected in the sediments. Two possibilities for the source of these concentrations are as follows:

  - The high concentrations are the result of direct discharge of MGP-related wastes to the sediments.
  - The high concentrations are the result of advective transport of dissolved-phase HPAHs/LPAHs from the two water-bearing zones to the Willamette River.

  These scenarios are not mutually exclusive. In their analysis, HAI and Anchor appear to have discounted the latter and de-emphasized the former to the extent that the focus of their reports is on TCE-related COIs.

- Omits discussion of NAPL migration to the river as a potential exposure pathway, and fails to recommend further characterization of the lateral and vertical extent of NAPL.

In general, the Source Control Evaluation Report relies on an incomplete understanding of site hydrogeology and contaminant distribution and is therefore inadequate.

Please call either of us at (971) 544-2139 if you have questions or comments.

Sincerely,

Maul Foster & Alongi, Inc.

James G.D. Peale, RG
Senior Hydrogeologist

James J. Maul
Principal Hydrogeologist

cc: Tom McCue; Wacker Siltronic

## Young, Cathryn

**From:** MCCLINCY Matt [MCCLINCY.Matt@deq.state.or.us]
**Sent:** Thursday, September 18, 2003 8:47 AM
**To:** Tom_mccue@siltronic.com
**Cc:** Cathryn Young (E-mail)
**Subject:** DEQ Photos

Tom,

Attached are copies of the photographs that I took yesterday.

Matt McClincy
Oregon Department of Environmental Quality
Northwest Region
2020 SW Fourth Ave., Suite 400
Portland, Oregon 97201-4987
Phone 503-229-5538
Fax 503-229-6945

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SCOEPA00010717

## Young, Cathryn

**From:** James Peale [jpeale@mfainc.org]

**Sent:** Monday, September 15, 2003 3:41 PM

**To:** MCCLINCY Matt

**Cc:** Jim Maul; cathryn_young@siltronic.com; Tom_mccue@siltronic.com

**Subject:** Results Summary

Matt – attached please find a summary of the results for WS-12. Please review the data and the two proposed screen depths. We anticipate initiating well construction on Wednesday, September 17; as such, if we need to schedule a group meeting to clarify issues following your review, tomorrow morning would be best.

James G.D. Peale, RG
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ENVIRONMENTAL & ENGINEERING CONSULTANTS

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# RESULTS SUMMARY

3121 Moody Avenue, Suite 200 | Portland, OR 97239 | Phone 971.544.2139 | Fax 971.544.2140

TO: File

DATE: September 15, 2003

FROM: James Peale, RG and Jim Maul, RG

PROJECT: 8128.01.06

RE: Groundwater Assessment

The following summarizes the groundwater analytical results from WS-12 and presents proposed screen depths for the monitoring well.

## SUMMARY OF RECONNAISSANCE GROUNDWATER DATA

Eight reconnaissance water samples were collected from boring WS-12. Samples were collected at depths between 100 and 206 feet below ground surface (ft. bgs); the interval between samples ranged from 9 to 19 feet. The boring was terminated upon reaching basalt (presumably the Columbia River Basalt formation) at about 206 ft. bgs. Samples were collected consistent with the equipment and protocols identified in the *Final Workplan – Groundwater Assessment* (MFA, June 10, 2003). Samples were analyzed for volatile organic compounds (VOCs) using USEPA Method 8260.

The analytical results are attached in Table 1. The samples collected from 100, 117, and 132 ft. bgs contained concentrations of TCE and its degradation products (cis-1,2-DCE and vinyl chloride). The samples collected from 147 and 166 ft. bgs did not contain TCE or VC; cis-1,2-DCE was detected in the sample from 166 ft. bgs. TCE and cis-1,2-DCE were detected in the deeper samples collected from 182, 197, and 206 ft. bgs. Figure 1 (attached) shows the concentrations detected in profile format.

Additional compounds of interest were detected starting at 166 ft. bgs and continuing to depth. Specifically, methyl-tert-butyl-ether (MTBE), chlorobenzene, and dichlorobenzene (DCB) isomers (1,2-, 1,3-, and 1,4-DCB) were detected. These constituents are not characteristic of past practices at the Wacker facility. The concentrations of MTBE and 1,2-DCB and 1,3-DCB generally increase with depth. Figure 2 (attached) shows the concentration profile.

## DATA EVALUATION

The results suggest two alternative explanations with respect to the nature and extent of TCE distribution.

1. TCE from the presumed source area has migrated through the vertical extent of the alluvial zone (i.e., to about 206 ft. bgs). The absence of TCE and its degradation products in the intermediate samples (from 147 and 166 ft. bgs) may be due to a subsurface heterogeneity in either the chemical behavior (with respect to transport and degradation) or the lithology (e.g., a massive silt zone between the source and WS-12).



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2. The deepest vertical extent of TCE distribution from the former UST area (the presumed source) is between 132 and 147 ft. bgs. The absence of TCE and its degradation products in the intermediate samples (from 147 and 166 ft. bgs) represent a "clean zone" through which the TCE from the former UST area has not traveled. Alternative 2 suggests that a contamination plume - entirely separate and distinct from the TCE from the former UST area - exists beneath the site. This conclusion is supported by the following:

- The detections of the DCB isomers and MTBE, (along with the TCE, without significant concentrations of its degradation products) in deeper samples are characteristic of an off-site, presumably upgradient source. Potential sources include (but are not limited to) the following sites:
    - The RPAC facility - dichlorobenzene isomers and TCE were identified in deep alluvium and basalt wells.
    - The Olympic Pipeline gasoline release.
    - Gasoline spills in 1991 and 1994 at the Kinder Morgan pump station at 6565 NW St. Helens Road.
- The TCE detected in the deeper samples is characteristic (with respect to concentrations) of the TCE detected in GP-11 at 96 ft. bgs (immediately above the basalt). DCB isomers were also detected in GP-11.

These data indicate that the deeper COIs detected in reconnaissance groundwater samples are not related to Wacker's operations and are characteristic of a separate source, or sources, of contamination originating upgradient of Wacker's operations.

**CONCLUSION**

MFA recommends locating screens at the 110-125 ft. interval and the 145-160 ft. interval. These intervals meet the criteria discussed in section 3.2 of the DEQ approved workplan.

Table 1
Analytical Data Summary

| Sample ID | WS12-W-100 | WS12-W-117 | WS12-W-132 | WS12-W-147 | WS12-W-166 | WS12-W-182 | WS12-W-197 | WS12-W-206 |
|---|---|---|---|---|---|---|---|---|
| Depth | 100 | 117 | 132 | 147 | 166 | 182 | 197 | 206 |
| 1,2-dichlorobenzene (DCB) | <0.2 | ND | <0.2 | <0.2 | **8.69** | **18.50** | **60.80** | **81.40** |
| 1,2-Dichloroethane | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | **0.54** | <0.2 | <0.2 |
| 1,3-DCB | <0.2 | <0.2 | <0.2 | <0.2 | **0.50** | **0.48** | **28.50** | **28.50** |
| 1,4-DCB | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | **2.15** | **2.11** |
| Benzene | **16.50** | **4.46** | **0.30** | <0.2 | <0.2 | **0.22** | <0.2 | <0.2 |
| Bromodichloromethane | <0.2 | <0.2 | <0.2 | **0.63** | <0.2 | <0.2 | <0.2 | <0.2 |
| Chlorobenzene | <0.2 | <0.2 | <0.2 | <0.2 | **7.83** | **21.80** | **7.56** | **6.48** |
| Chloroform | **2.10** | **2.61** | <0.2 | **0.62** | <0.2 | <0.2 | <0.2 | <0.2 |
| cis-1,2-dichloroethylene (DCE) | **1.65** | **21.00** | **2.86** | <0.2 | **0.61** | **1.03** | **0.62** | **0.88** |
| Ethylbenzene | <0.2 | <0.2 | **1.00** | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| m,p-xylene | **0.30** | <0.2 | <0.2 | <0.4 | <0.4 | <0.2 | <0.2 | <0.2 |
| MTBE | <0.5 | <0.5 | <0.5 | <0.5 | **3.35** | **8.44** | **15.50** | **15.30** |
| n-Propylbenzene | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | **0.29** | **0.25** | <0.2 |
| Naphthalene | **1.17** | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| o-xylene | **0.81** | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Styrene | <0.2 | <0.2 | **4.64** | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Toluene | **1.30** | <0.2 | **11.90** | <0.2 | <0.2 | **0.38** | **0.36** | <0.2 |
| trans-1,2-DCE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | **0.47** | <0.2 | <0.2 |
| Trichloroethylene | **0.58** | **1.63** | **0.50** | <0.2 | <0.2 | **0.85** | **0.86** | **1.93** |
| Vinyl chloride (chloroethylene) | **5.75** | **66.10** | **4.33** | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |

.0257 g/100 ml



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Concentrations in micrograms per liter (ug/L).

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Figure 1

## WS-12 Concentration-Depth Profile

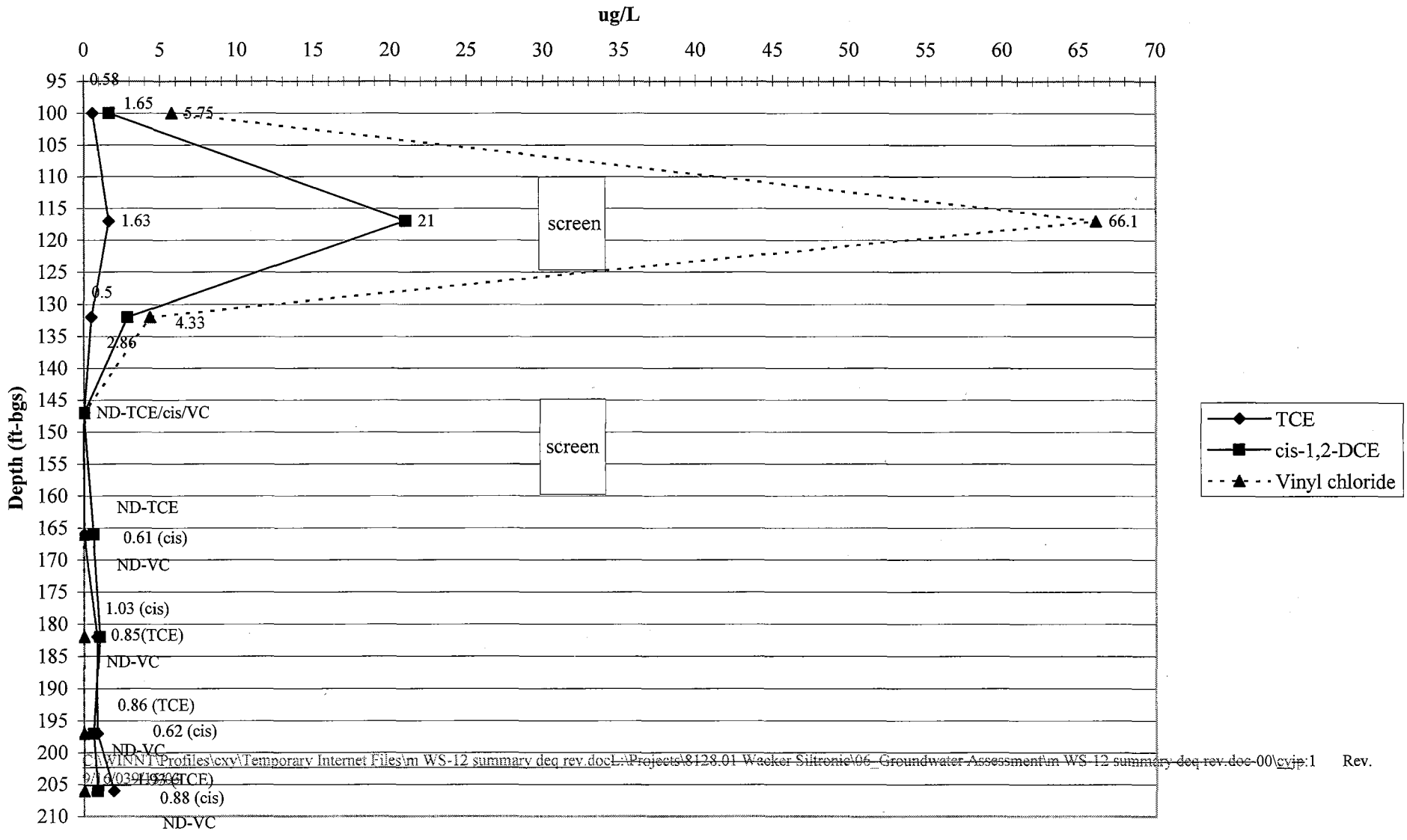




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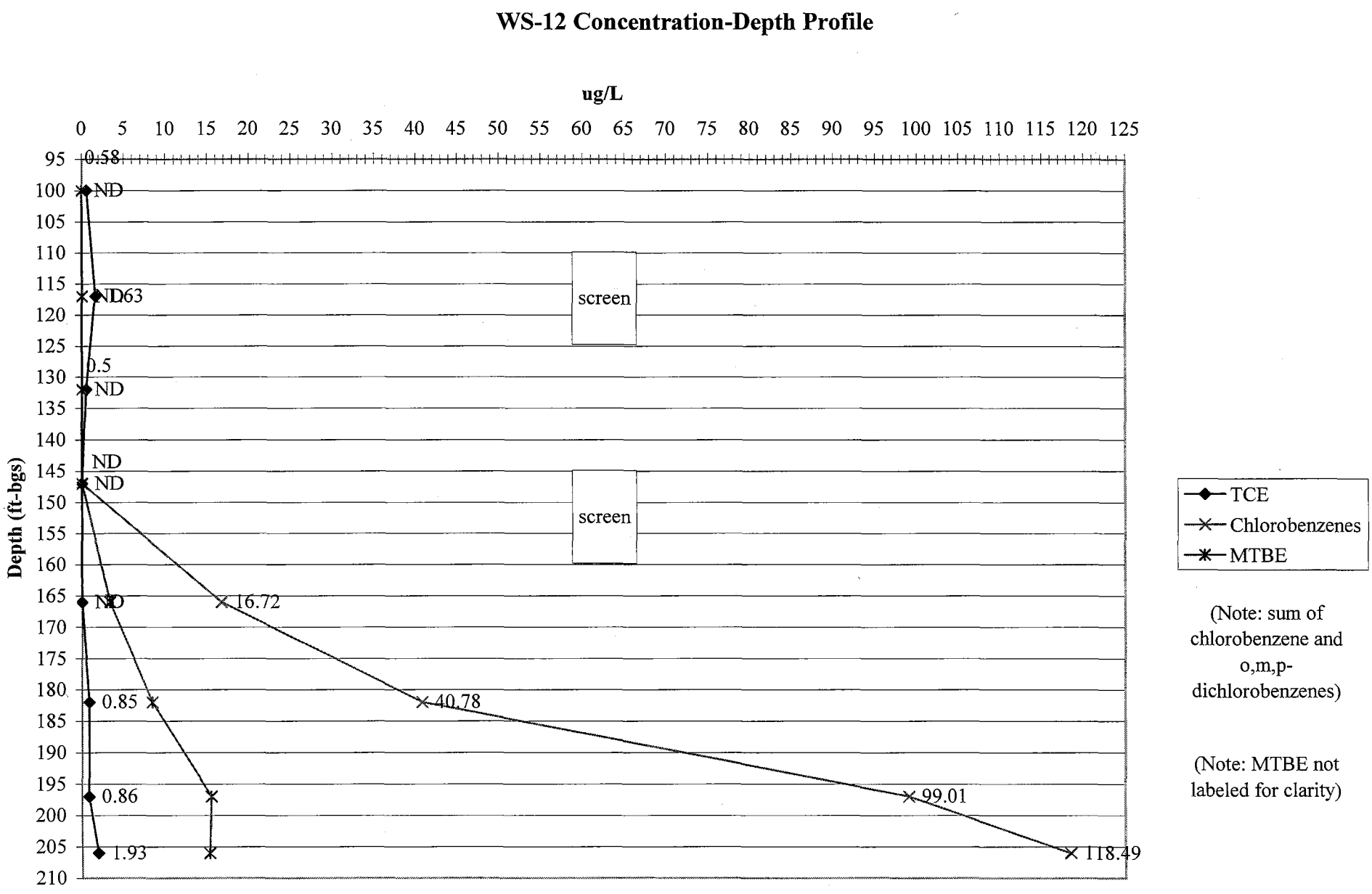
Figure 2

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## Young, Cathryn

**From:** James Peale [jpeale@mfainc.org]
**Sent:** Thursday, July 31, 2003 12:10 PM
**To:** cathryn_young@siltronic.com; Young, Cathryn
**Cc:** Jim Maul
**Subject:** results summary

Cathryn – Attached please find a summary of the analytical results for the four geoprobe borings. Please call me if you have any questions. I will be returning to my desk at about 1245.

James G.D. Peale, RG
Senior Hydrogeologist
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# RESULTS SUMMARY

ATTORNEY-CLIENT PRIVILEGED MATERIAL

3121 Moody Avenue, Suite 200 | Portland, OR 97239 | Phone 971.544.2139 | Fax 971.544.2140

TO: File

DATE: July 29, 2003

FROM: James Peale

PROJECT: 8128.01.06

RE: Groundwater Assessment

The following summarizes the results of the geoprobe investigations. The first section briefly discusses the drilling. The second section summarizes the (preliminary) analytical results. Table 1 (attached) provides a graphical summary of the analytical results.

## Drilling

**GP-11** was started on July 14, 2003. The lithology generally consisted of fill to about 28 feet below ground surface (bgs); silts and sand to about 80 ft. bgs; sand to about 94 feet bgs.; silt to about 95 ft. bgs; and sandy gravel to about 96.5 ft. bgs. The boring was terminated at 96.5 ft. bgs due to equipment refusal. Some of the gravel collected from the last soil sample was characteristic of the Columbia River Basalt (CRB) formation previously identified in the region. The depth to groundwater (following collection of the shallow groundwater sample) was about 40 ft. bgs.

Impacts characteristic of Northwest Natural's (NWN) past practices were observed in soil from about 15 to 23 ft. bgs. Two soil samples and three groundwater samples were submitted for analysis. The boring was grouted on July 16.

**GP-10** was started on July 16. The lithology generally consisted of fill material (pea gravel and sand) to about 15 ft. bgs; sand to about 24.5 ft. bgs; and silt from 24.5 to 25 ft bgs. The boring was terminated at 25 ft. bgs.

Impacts characteristic of Northwest Natural's (NWN) past practices were observed in soil from about 19 to 24.5 ft. bgs. An apparent non-aqueous phase liquid (NAPL) was present from about 20 to 24.5 ft. bgs. The NAPL was brown-black and exhibited a naphthalene-like odor. The boring was grouted on July 16.

**GP-8** was started on July 16. The lithology generally consisted of fill material (pea gravel and sand) to about 19 ft. bgs; sand to about 23 ft. bgs; and silt from 23 to 25 ft bgs. The boring was terminated at 25 ft. bgs. No NAPL or other significant impacts were observed in this boring. The boring was grouted on July 16.

**GP-9** was started on July 17. The lithology generally consisted of fill (sand) to about 10 ft. bgs; fill (gravel) to about 15 ft. bgs; fill (sand) to about 24 ft. bgs; and silt to 25 ft. bgs. No NAPL or other significant impacts were observed in this boring.

The depth to water in all borings was measured as approximately 15 ft. bgs.



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**Analytical Results**

On Tuesday, July 22 we received preliminary data for GP-11 from Specialty. Soil and groundwater samples were analyzed for VOCs. One soil sample was analyzed for polynuclear aromatic hydrocarbons (PAHs) by EPA Method 8270. The following section summarizes the results:

- Shallow soil (15 feet below ground surface [ft. bgs]) – 16 PAHs[1] were detected at concentrations ranging from 4,300 ug/Kg (dibenz(a,h)anthracene) to 123,000 ug/Kg (pyrene). These compounds are characteristic of waste from NWN's past practices.

- Shallow soil (17 ft. bgs) – VOCs (specifically, trimethylbenzene, ethylbenzene, xylenes, naphthalene, and benzene) were detected at concentrations ranging from 10ug/Kg to 3,270,000 ug/Kg. These compounds are characteristic of waste from NWN's past practices. No chlorinated volatile organic compounds (CVOC)s were detected.

- Deeper soil (27 ft. bgs) – Only naphthalene was detected at 36.6 ug/Kg.

- First groundwater (40 ft. bgs) – No VOCs were detected above the method reporting limits (MRLs).

- Deep groundwater (70 ft. bgs) – Only toluene was detected at 0.55 ug/L.

- Bottom groundwater (96 ft. bgs) – 1,2-dichlorobenzene and 1,3-dichlorobenzene were detected at concentrations of 105 ug/L and 37.7 ug/L, respectively. Chlorobenzene was detected at 64 ug/L. Chlorinated benzene compounds may be characteristic of past practices at the former herbicide production facility to the south. Benzene, naphthalene, and toluene were detected at concentrations of 0.41, 0.77, and 0.49 ug/L, respectively. TCE and vinyl chloride (VC) were detected at concentrations of 0.62 and 0.46 ug/L, respectively.

On Thursday, July 24 we received preliminary data for the GPs completed in the former UST area. The following section summarizes the results:

- TCE and its primary breakdown product, cis-1,2-DCE (DCE) were detected in a soil sample collected from 20 ft. bgs at concentrations of 557,000 and 208,000 ppb, respectively. The sample was collected from a sandy material that included apparent non-aqueous phase liquid (NAPL) characteristic of NWN's past practices.

- TCE, DCE and VC were detected in groundwater samples collected from about 24 ft. bgs. The highest concentration of TCE was 616 ppb; the highest concentration of DCE was 6,360 ppb; and the highest concentration of VC was 9.23 ppb. The samples were collected from a sandy material.

- TCE was detected in one sample collected from about 25 ft. bgs at concentrations of 211 and 859 ppb. DCE was detected in both samples collected from about 25 ft. bgs at concentrations ranging from 675 to 971 ppb. VC was detected in one sample collected from about 25 ft. bgs at 105 ppb. The samples were collected from a silty material that was observed in all three borings.

[1] All 16 PAHs typically reported by the method used were detected at varying concentrations.

- PAHs were detected in one sample collected from about 20 ft. bgs at concentrations ranging from 193 to 10,200 ppb[1]. Naphthalene was detected in all of the soil samples collected from the former UST area at concentrations ranging from 1,610 ppb to 6,450,000 ppb. Naphthalene was detected in all of the groundwater samples at concentrations ranging from 6,990 ppb to 8,430 ppb. Naphthalene is considered characteristic of NWN's past practices.

Table 1
Analytical Summary

| Depth (ft) | USCS | GP8 | | GP9 | | | GP10 | |
|---|---|---|---|---|---|---|---|---|
| | SP | | | | GP9-S-20 | | | GP10-S-20 |
| | | | | TCE | **37.5** | | TCE | **557000** |
| | | | | 1,1 DCE | <10 | | 1,1 DCE | <50000 |
| 20 | | | | cis-1,2-DCE | **71.3** | | cis-1,2-DCE | **208000** |
| | | | | trans-1,2-DCE | <10 | | trans-1,2-DCE | <50000 |
| | | | | VC | <10 | | VC | <50000 |
| | | | GP8-S-22 | | | | | |
| | | TCE | <10 | | | | | |
| | | 1,1 DCE | <10 | | | | | |
| 22 | | cis-1,2-DCE | <10 | | | | | |
| | | trans-1,2-DCE | <10 | | | | | |
| | | VC | <10 | | | | | |
| | | | GP8-W-24 | | GP9-W-24 | GP-W-DUP | | GP10-W-24 |
| | | TCE | **616** | TCE | **273** | **287** | TCE | **8** |
| | | 1,1 DCE | **10.9** | 1,1 DCE | **26.8** | **30.6** | 1,1 DCE | **46.7** |
| 24 | | cis-1,2-DCE | **1330** | cis-1,2-DCE | **6360** | **5530** | cis-1,2-DCE | **3590** |
| | | trans-1,2-DCE | **2** | trans-1,2-DCE | **11.7** | **13.3** | trans-1,2-DCE | **18.8** |
| | | VC | **4.44** | VC | **9.23** | **8.49** | VC | **8.75** |
| | ML | | GP8-S-25 | | GP9-S-25 | GP9-S-DUP | | |
| | | TCE | <10 | TCE | **211** | **859** | | |
| | | 1,1 DCE | <10 | 1,1 DCE | **17.3** | **12.7** | | |
| 25 | | cis-1,2-DCE | **675** | cis-1,2-DCE | **855** | **971** | | |
| | | trans-1,2-DCE | <10 | trans-1,2-DCE | **11** | <10 | | |
| | | VC | **105** | VC | <10 | <10 | | |

Results in ppb (ug/Kg or ug/L)



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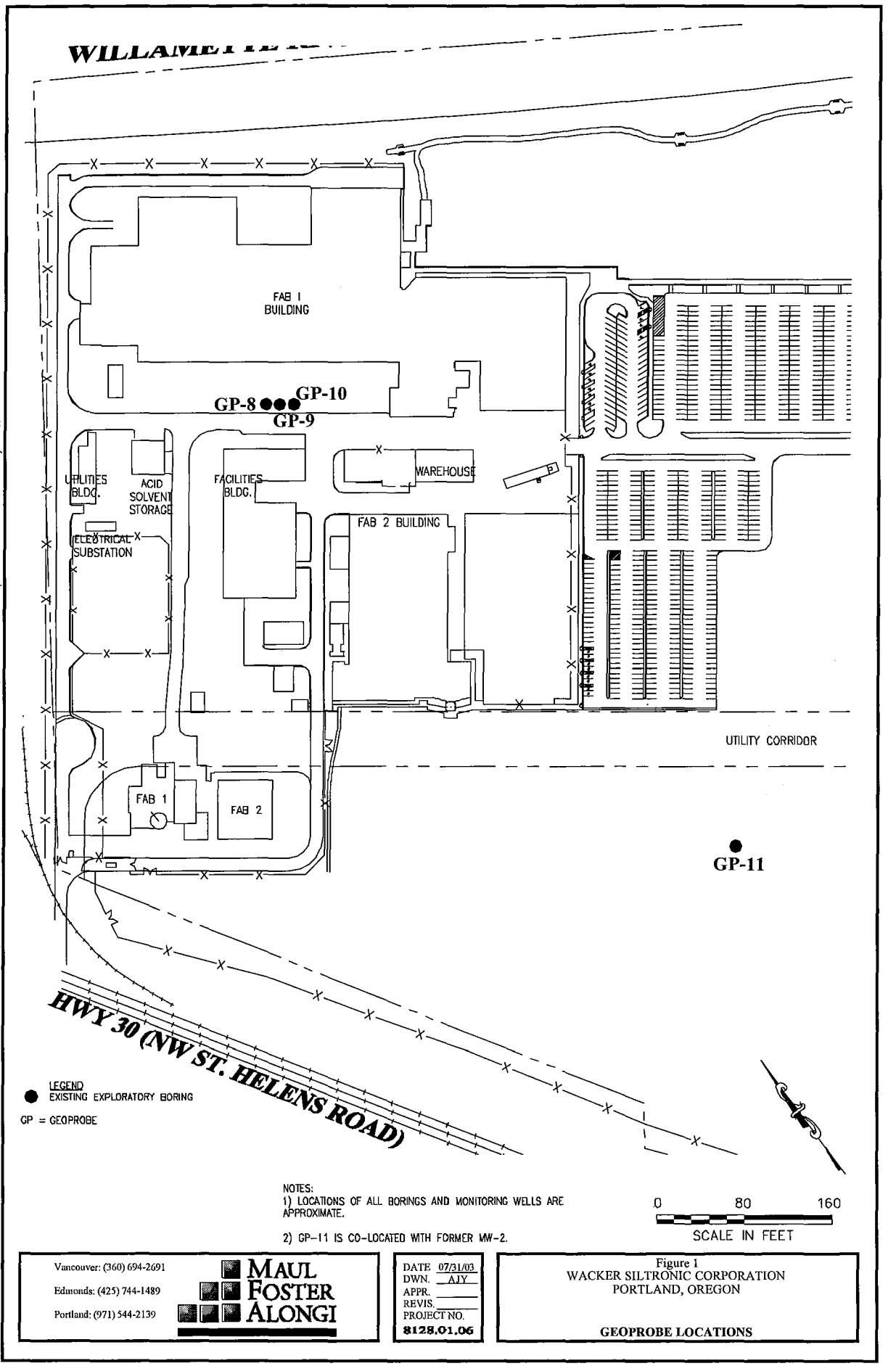


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LAYOUT: 1


Vancouver: (360) 694-2691
Edmonds: (425) 744-1489
Portland: (971) 544-2139
MAUL FOSTER ALONGI


DATE 07/31/03
DWN. AJY
APPR.
REVIS.
PROJECT NO.
8128.01.06

Figure 1
WACKER SILTRONIC CORPORATION
PORTLAND, OREGON

**GEOPROBE LOCATIONS**

SCOEPA00010730

# LIMITED ACCESS AGREEMENT

**DATE:**

**July 30, 2001** **"EFFECTIVE DATE"**

**BETWEEN:**

**WACKER SILTRONIC CORPORATION** **"WACKER"**
**7200 NW Front Ave.**
**Portland, Oregon 97210**

**AND:**

**NORTHWEST NATURAL GAS COMPANY** **"NORTHWEST NATURAL"**
**220 NW 2nd Avenue**
**Portland, Oregon 97209**

**THIS AGREEMENT** is made and entered into between Wacker Siltronic Corporation ("Wacker"), an Oregon corporation, and Northwest Natural Gas Company ("Northwest Natural"), an Oregon corporation.

## RECITALS

A. Wacker owns that certain real property located at 7200 NW Front Avenue, Portland, Oregon ("Property") and more particularly described in the attached Exhibit;

B. The Oregon Department of Environmental Quality ("DEQ") has issued its *Order Requiring Remedial Investigation and Source Control Measures No. ECVC-NWR-00-27,* dated October 4, 2000 (the "Order"), jointly to Wacker and Northwest Natural, and both parties hereto have notified DEQ that they will comply with the Order, without admitting liability for any condition or contamination which may exist or may have existed on the Property. A copy of the Order is attached hereto, and by this reference is incorporated herein.

C. Northwest Natural and Wacker have agreed that Northwest Natural will perform the Remedial Investigation required by the Order, and have agreed that Northwest Natural shall have access to the Property for such purposes, upon and subject to the terms and conditions set forth herein.

## AGREEMENT

**NOW THEREFORE,** in consideration of the mutual promises set out below, the parties hereby agree:



SCOEPA00010731

1. **Incorporation.** The above Recitals are incorporated herein by this reference as material terms of this Agreement, and not as mere recitals.

2. **Defined Terms.** As used in this Agreement, the following terms shall have the meanings set forth below:

   (a) Legal Requirements. Any and all applicable federal, state and local environmental laws, rules and regulations.

   (b) Damages. Any actions, orders, claims, demands, defenses, judgments, losses, injury to person (including death) or damage to property, causes of action, expenses and reasonable attorneys' and environmental consultants' fees, penalties, fines, and interest including, but not limited to, the cost of any restoration, repair and/or replacement of any building or other improvements on the Property which are damaged or destroyed in connection with this Agreement (other than equipment owned by Northwest Natural, if any).

   (c) Remedial Investigation. All investigative actions required by Sections 5.A and 5.C(2) of the Order, and any Work Plan adopted pursuant to said sections of the Order.

   (d) Authorized Representatives. As used in this Agreement, the terms Northwest Natural and Wacker include their respective employees, agents, authorized representatives, contractors, and subcontractors, retained either directly or indirectly.

   (e) Additional Terms. All other terms used herein, if not readily understandable from their context or plain meaning, shall have the meanings ascribed to them in the Order.

3. **Term of Agreement**. This Agreement shall begin on the Effective Date hereof and continue until the conclusion of all Work needed to complete the Remedial Investigation, which is to be conducted by Northwest Natural, unless earlier terminated.

4. **Grant of Access to Northwest Natural.**

(a) Wacker hereby grants to Northwest Natural, and its agents, employees, and contractors, ingress and egress to the Property, except the interior of any building or structure located thereon, as is reasonably necessary to accomplish the Remedial Investigation, subject to all the terms and conditions set forth in this Agreement; provided however that, without Wacker's prior written consent, which may be withheld or conditioned in its sole discretion:

   (i) Northwest Natural may only do the following on the Property to the extent required under the Work Plan approved by DEQ:

      (A) obtain soil, sediment, water, and groundwater samples;

(B) conduct surveys of the subsurface using ground penetrating radar or similar technology;

(C) drill, as necessary, bore holes and temporary sampling wells or geoprobes;

(D) install monitoring wells;

(E) sample from existing or newly installed monitoring wells approved for inspection pursuant to the Order and under Wacker's or Northwest Natural's control herein; and,

(F) survey as necessary the ground surface to confirm the location of wells and other sampling locations and the elevations of surface and subsurface conditions; and

(G) if necessary because of logistical or regulatory constraints, establish a staging area at a location acceptable to Wacker for the staging, preparation, assembly, maintenance, disassembly and decontamination of all necessary and desirable equipment.

(ii) Northwest Natural may not damage or obstruct any road, driveway, or other ingress/egress point to or on the Property.

For the purposes of this Agreement, the term "Work Plan" shall mean the scope of work, specific tasks, and work schedule that, following negotiation with Northwest Natural, DEQ approves to comply with Section 5.A. and (if required) Section 5.C(2) of the Order, and Section I. of Attachment B thereto, incorporated herein by this reference. The activities described in the Work Plan to be conducted on the Property shall be referred to herein as the "Work."

(b) Northwest Natural is authorized upon 24 hours advance notice to Wacker to enter and remain on the Property between the hours of 7:00 a.m. and 7:00 p.m. on any day during the term of this Agreement for the purposes of conducting the Work, subject to the terms and conditions set forth in this Agreement. A representative of Wacker may (but is not required to) observe and monitor all activities conducted by or on behalf of Northwest Natural under this Agreement. The Work to be performed by Northwest Natural shall be conducted, to the maximum extent possible, without disruption of or interference with the use of the Property by Wacker, its agents, assigns, or successors.

**5. Performance of Work.** Northwest Natural shall:

(a) ensure that all Work is performed in a good and workmanlike manner;

(b) pay all costs incurred for all materials and labor in the Work, including any government charges for oversight; provided however, that Northwest Natural's agreement to pay such costs shall not be deemed to be a release or waiver of

Northwest Natural's right, if any, to recover all or a portion of such costs from other parties (including Wacker) who or that might be liable for the same;

(c) keep the Property free and clear of all mechanic's liens and other encumbrances;

(d) in connection with the performance of the Work, promptly and properly repair any damage to any portion or portions of the Property which may have been inadvertently damaged, and restore same to the same or better condition and grade level existing before the commencement of any Work including, but not limited to, any necessary repairs to paving and landscaping (hereafter, "Restoration");

(e) prevent any injury that may result from the Work or Restoration to persons or property and allow the full utilization of the Property by Wacker during the performance of the Work and Restoration. For the purposes of this Agreement, 'injury' to 'persons or property' includes, but is not limited to, damages or business losses caused by any material delay or materially increased cost of production and any other material economic injury to Wacker resulting from or as a consequence of the Work or Restoration;

(f) to the extent possible, construct all installations required by the Work below the finished ground line;

(g) prevent the release of any hazardous substances or other environmental damage or deterioration to the Property during the course of the Work, provided however, that for the purposes of this subsection, the term "release" shall not be construed to include the passive migration of hazardous substances that may already be present on or under the Property; and Northwest Natural shall promptly notify Wacker's designated representative (as set forth in Section 11 hereof) of any suspected release or any other condition that is reportable under applicable Legal Requirements.

(h) at all times while on the Property, comply with all applicable Legal Requirements, including (without limitation) the Order.

(i) properly manage, store, and dispose of any waste, including drill cuttings, purge volumes, and decontamination fluids and materials generated by its sampling ("Investigation Derived Waste' or "IDW"). Northwest Natural may temporarily store drums of IDW on the premises for so long as reasonably necessary to arrange for transportation off the Premises, but in no event shall Northwest Natural store any IDW on the Premises longer than three (3) working days after characterization of the IDW is available for preparation of necessary manifests.

(j) furnish to Wacker, contemporaneously with delivery to DEQ, copies of all reports, correspondence and other materials submitted to DEQ pursuant to the Work Plan.

6. **Indemnity**. Northwest Natural shall defend, indemnify, and hold Wacker free and harmless from any and all claims, demands, actions, suits, damages, injury to persons or property, costs, penalties, fines or expenses (including reasonable attorney, engineering, and other professional or expert fees) arising out of or related to the access to, the Work or Restoration, or any other action or omission of Northwest Natural, its agents, employees, subcontractors, or any other person acting on Northwest Natural's behalf (hereinafter "Claim") on the Property except to the extent such Claim is alleged to arise from the willful or unlawful acts or omissions of Wacker. In the event that any Claim is alleged to arise from a willful or unlawful act or omission of Wacker that occurs in combination with any conduct or omission of Northwest Natural, its agents, employees, or subcontractors or any other person acting on Northwest Natural's behalf, Northwest Natural shall indemnify Wacker except for that percentage of the damage which Wacker is shown to be responsible under this Section. Each party shall provide the other with prompt written notice of any Claim which comes to the attention of either party.

7. **Insurance**. Northwest Natural shall, and shall cause its agents, contractors, and any other person accessing the Property on behalf of Northwest Natural, to maintain broad form commercial general business liability insurance coverage on a "claims made" basis, including hazards of operations including explosion, collapse and underground coverage, independent contractor coverage, broad form bodily injury and property damage liability coverage, products/completed operations coverage, contractual liability, and pollution liability coverage; and naming Wacker as additional insured, in a combined single limit amount of not less than five million dollars ($5,000,000), with a general aggregate for all occurrences within such policy year of not less than ten million dollars ($10,000,000), in each case such limits to be maintained regardless of any payouts made thereunder. Northwest Natural shall deliver to Wacker a copy of a Certificate of Insurance confirming: (i) the existence of such coverage and evidence of the annual renewal thereof, certifying that each such party has been insured as required above; and, (ii) if such insurance is to be cancelled or the coverage modified for any reason by any party thereto, notify, or cause the insurance company to notify, Wacker by written notification sixty (60) days prior to the cancellation or modification thereof.

8. **Reserved Rights**. Nothing contained herein (including without limitation Northwest Natural's agreement to pay for the Remedial Investigation as set forth in subsection 5(b) hereof and the Indemnity of Section 6 hereof) shall be deemed to be a release or waiver of Northwest Natural's rights to claim reimbursement or contribution from any other party (including Wacker), if any, who or that might be liable for any costs or expenditures in connection with hazardous substances at or migrating onto or from the Wacker Property; and Northwest Natural hereby reserves all such rights.

9. **Use by Wacker**. The access granted herein shall be non-exclusive, and Wacker retains for itself and its successors and assigns and its lessees, franchisees, licensees and invitees, the right to continue to use all portions of the Property for all lawful purposes, so long as such use does not unreasonably interfere with the use of the Property by Northwest Natural for the purposes herein set forth. Northwest Natural expressly acknowledges and agrees that Wacker may construct one or more structures or buildings, or remodel or

repair the existing structures and buildings on the Property during the performance of the Work and any Restoration.

10. **Nonacquiescence.** The obligations of this Agreement shall not be construed or deemed an acquiescense in or acknowledgment of any right by Northwest Natural or any other person to access to the Property, nor an acceptance of the adequacy of sufficiency of the results of sampling or any conclusion or recommendation based upon the sampling.

11. **Notice**. Notices shall be delivered in person or mailed by first class mail with copy by facsimile on the same day as mailing to the following address and facsimile number to the attention of the person specified below;

To Wacker:

Cathryn Young
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, OR 97210
Fax: (503) 241-7599
E-mail: cathryn_young@siltronic.com

To Northwest Natural:

Robert J. Wyatt
Northwest Natural
220 NW 2nd Avenue
Portland, OR 97209
Fax (503) 273-4815
Email: rjw@nwnatural.com

12. **Termination and Survival**. This Agreement shall remain in full force and effect for so long as Northwest Natural is performing Work, as required by the Order, and is otherwise in full compliance with the Order and in substantial compliance with the terms of this Agreement. In the event that Northwest Natural ceases such work or is declared by DEQ to be in violation of the Order, or fails (after written notice and a reasonable opportunity to cure) to remedy any material and substantive breach of this Agreement, Wacker may terminate this Agreement at will; provided, however, that Sections 1, 2 and 6 hereof shall survive any termination of this Agreement.

The parties have executed this Agreement as of the date first set forth above.

NORTHWEST NATURAL GAS COMPANY

By: _____

Its: Pres / COO

WACKER SILTRONIC CORPORATION

By: _____

Its: Pres/ CEO



SCOEPA00010737

# REMEDIAL INVESTIGATION SCOPING DOCUMENT

Wacker Siltronic Corporation Property
7200 NW Front Avenue
Portland, Oregon

November 20, 2000

**HAHN AND ASSOCIATES, INC.**
**Environmental Consultants**

434 NW 6th Avenue, Suite 203
Portland, Oregon 97209-3651
503/796-0717 • 503/227-2209 FAX

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NORTHWEST REGION

# REMEDIAL INVESTIGATION SCOPING DOCUMENT

Wacker Siltronic Corporation Property
7200 NW Front Avenue
Portland, Oregon

November 20, 2000

Prepared for:

NW Natural
Portland, Oregon

Prepared by:

Hahn and Associates, Inc.
Portland, Oregon

HAI Project No. 5237

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2 Site Map

3 EPA Sediment Sample Location Map

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6 Conceptual Push Probe and Well Locations

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A Historical Aerial Photographs



SCOEPA00010741

# REMEDIAL INVESTIGATION SCOPING DOCUMENT

Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

November 20, 2000

## 1. INTRODUCTION

NW Natural has retained Hahn and Associates, Inc. (HAI) to complete Remedial Investigation (RI) activities at the Wacker Siltronic Corporation (Wacker) property, 7200 NW Front Avenue, Portland, Oregon (Figures 1 and 2). RI activities at the Wacker property are to be completed as per an Order (DEQ No. ECVC-NWR-00-27) issued jointly to both NW Natural and to Wacker by the Oregon Department of Environmental Quality (DEQ), dated October 4, 2000. The sole stated purpose of the order is to provide for the completion of RI activities sufficient in scope to "determine the nature and extent of releases of hazardous substances to Willamette River sediments from certain property in Multnomah County, and to develop and implement source control measures, if necessary."

This RI Scoping document outlines the rationale and approach for meeting the purpose of the Order by performing a focused RI at the Wacker site, and is intended to provide a framework for the RI Work Plan which will be submitted at a later date.

This RI Scoping document presents a conceptual model for the hydrogeology and the nature of contamination at the Wacker site as it may pertain to potential sediment impacts, and outlines the general approach for performing the RI. The RI Scoping document also presents a preliminary scope of work for the Phase I Remedial Investigation.

## 2. BACKGROUND

The Wacker site is located within a 6-mile stretch of the Lower Willamette River in which the U.S. Environmental Protection Agency (EPA) conducted a sediment study in September and October 1997. This area, referred to as the Portland Harbor, is between the upstream ends of Sauvie Island (River Mile (RM) 3.5) and Swan Island (RM 9.5).

Results of the 1997 EPA sediment investigation, as conducted by the EPA's contractor, Roy F. Weston, Inc., are documented within a May 1998 report entitled *Portland Harbor Sediment Investigation Report, Multnomah County, Oregon* (Weston, 1998). As provided within the Weston report, the overall sediment investigation involved the collection of 150 shallow (upper 6 to 17 centimeters (cm)) and 37 deep (55 to 139 cm) near-shore sediment samples throughout the Portland Harbor, of which 7 samples (6 shallow, 1 deep) were



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collected adjacent to the Wacker site, while 5 samples (all shallow) were collected adjacent to the NW Natural – Gasco facility, located immediately northwest and downstream of the Wacker site. Sediment sampling locations are depicted on Figures 2 and 3.

All Portland Harbor sediment samples were analyzed for total metals, semi-volatile organic compounds (SVOCs) including PAHs, total organic carbon (TOC), and sediment grain size. Additionally, selected Portland Harbor samples, including 4 samples collected adjacent to Wacker property, were analyzed for polychlorinated biphenyls (PCBs), titanium, and organotins (TBTs), while 5 Wacker-area samples were analyzed for pesticides, and 1 was analyzed for chlorinated herbicides.

Based on analytical results provided within the Weston report, which showed areas of elevated chemical concentrations within the study area, the EPA has proposed that the Portland Harbor be included on the federal National Priority List (NPL); also known as Superfund.

As detailed within a DEQ *Strategy Recommendation* document for the Wacker Site dated October 8, 1999 (DEQ, 1999), the DEQ evaluated the 1998 Weston Report to ascertain possible sources for those areas of elevated chemical concentrations identified within the Harbor that were not otherwise being actively addressed in DEQ's Cleanup Programs. As part of this review, the DEQ flagged areas within the Portland Harbor based on the following three criteria:

- Areas having the highest detected concentration of a given contaminant;
- Areas with contaminant concentrations in the upper five percent of a given contaminant's detected concentrations throughout the Harbor; and
- Areas having contaminant concentrations above an apparent "baseline range" most commonly detected throughout the harbor area.

According to the DEQ Strategy Recommendation document, the contaminant "baseline range" was developed by examining the geometric distribution of concentrations for each contaminant detected. Any sediment concentrations that appeared to depart significantly from the ranges most commonly detected were suspected of lying near a potential contaminant source.

The DEQ data evaluation described above was strictly based on frequency or magnitude of chemical detection, and did not involve a hazard evaluation or an assessment of risk. Results of the DEQ evaluation indicated the presence of elevated chemical concentrations within sediments adjacent to the Wacker property with concentrations ranging from 1.2 times (inorganics) to 100 times (PAHs) the apparent Portland Harbor baseline concentrations (Table 1). Accordingly, the DEQ reached the conclusion that past and/or present operations conducted at the Wacker property may have led to the observed exceedances of the apparent harbor baseline sediment concentrations, and that a remedial investigation should be conducted to evaluate the nature and extent of potential ongoing releases from the Wacker property to the Willamette River sediments.



SCOEPA00010743

With regard to the adjacent downstream NW Natural – Gasco facility, as summarized on Table 1, slight exceedances of the apparent harbor baseline for several inorganic compounds were identified, none by more than 1.5-times while PAHs were identified at concentrations greater than 200 times the apparent Portland Harbor baseline concentration. NW Natural is currently nearing completion of RI activities associated with the Gasco property, a process that has been undertaken as per an agreement (DEQ No. ECVC-WMCVC-NWR-94-13) under the DEQ's Voluntary Cleanup Program.

## 3. SITE LOCATION AND DESCRIPTION

Wacker Siltronic operates a silicon wafer fabricating facility on an 85 acre site along the western bank of the Willamette River in a section of northwest Portland zoned by the city as "Heavy Industrial".

The property, situated immediately northwest of the Burlington Northern / Santa Fe (BNSF) railroad bridge, is generally rectangular in shape. Property boundaries include the Willamette River to the northeast; BNSF railroad berms to the southwest and southeast; and a property line shared with NW Natural and Koppers Industries, Inc. (KII) to the northwest (i.e., the former Gasco-facility property). US Highway 30 (NW St. Helens Road), a former rock quarry, and the Tualatin Mountains lie beyond the BNSF right-of-way to the southwest. Beyond the southeastern BNSF right-of-way lie the Rhone-Poulenc, ESCO Corp., Gould / NL Industries, and Elf Atochem North America properties, all of which are undergoing environmental investigation and/or cleanup.

Presently, the Wacker site is approximately 50% to 60% developed with two silicon wafer fabrication plants (Fab 1 and Fab 2) and associated wastewater treatment plants and structures, as well as a Portland General Electric (PGE) substation, an administration building, and parking facilities (Figure 2). A majority of the development activities completed to date have occurred within the northeastern and northwestern portions of the property, extending along nearly the full length of the shared property line with NW Natural. Much of the southern portion of the site is currently undeveloped. Access to the site is limited due to the site's proximity to the river and the railroad grades that border the site on two sides. The active portions of the facility are fenced, and the area is patrolled by private security personnel.

Additional site features include a narrow greenway that has been created along the full riverfront portion of the property, as well as an approximate 100-foot wide City of Portland utility easement that divides the property from the northwest to the southeast (Figure 2). Underground utilities that exist within the City of Portland easement include oil, gasoline, natural gas, water, and sewer pipelines, as well as electric and telephone cables.



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## 4. SITE USE AND DEVELOPMENT HISTORY

This section provides a summary description of historical property ownership and site development activities that are of pertinence to the present-day Wacker property.

### 4.1 Property Ownership

As provided within a March 7, 1985 report prepared for the Portland Development Commission (PDC) entitled *Site History, Wacker Siltronic Corp., Portland, Oregon 1850-1984* (PDC, 1985), in the mid to late 1800s the land between the St. Johns and Burlington Northern railroad bridge (includes the current Wacker, NW Natural, and U.S. Government Moorings properties) was owned by Milton Doane and William Baker, with ownership having been established through Donation Land Claims. As of 1906, title records indicate the property to be owned by the Spokane, Portland, and Seattle Railroad, which apparently received the property as part of a large land grant (PDC, 1985). Portland Gas & Coke (PG&C) purchased the Wacker property from the railroad in 1939, and in 1962 sold it to Victor Rosenfeld and H.A. Anderson, who in turn conveyed an interest in the property to Gilbert Schnitzer in 1964. The PDC purchased the property from Rosenfeld and Anderson in 1978 as part of an Urban Renewal project, and during the same year subsequently sold the property to Wacker, who has owned and utilized the property since that time.

### 4.2 Site Use and Development

#### 4.2.1 Pre-Development Conditions

According to the Site History report (PDC, 1985), with the exception of the adjacent railroad construction, the Wacker site remained primarily undisturbed prior to 1900. The southwest portion of the pre-developed property contained part of a small, shallow lake (reportedly less than 5 feet deep) known as Doane Lake, which was bisected by the present Burlington Northern railroad bridge at the time of its construction in 1906 (see Figure 1 and the 1936 aerial photo, Appendix A). The remainder of the property consisted primarily of low lying wooded wetlands, prone to seasonal flooding. The PDC report indicates that a small creek traversed the property, with its source being the Tualatin Mountains immediately across NW St. Helens Road in what is now Forest Park. As depicted in aerial photographs of the site taken in 1936 and 1940 (Appendix A), it appears that Doane Lake was an additional headwater for this creek.

With additional regard to the above-identified creek, it is noted that a 1906 elevation survey map (pre-development) of the adjacent PG&C property to the northwest of the present-day Wacker site, depicts a small northwest-southeast trending creek situated approximately midway between the Tualatin Mountains and the Willamette River and extending onto the Wacker site. Although the map does not extend it's coverage to the present day Wacker



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property, it would seem likely that this creek would be a drainage associated with the former Doane Lake located at the southwest corner of the Wacker property. As evidenced by 1936 and 1940 aerial photographs (Appendix A), with the development and partial filling of the PG&C property (circa 1913), this creek was ultimately diverted to the northeast, with discharge into the Willamette River near the present day NW Natural / Wacker property line.

### 4.2.2 Western Transportation Operations

The earliest known use of the present day Wacker property was in the mid 1930s by Western Transportation, which had a river dock with two piers, five buildings, and two above-ground fuel storage tanks located in the southeastern portion of the site (Figure 4). Western Transportation used the facility for refueling tugs and to tie log rafts and barges (PDC, 1985). Historical aerial photographs indicate the dock and piers were removed prior to 1960, while the buildings were removed some time between 1967 and 1973 (Appendix A).

During the same timeframe as the Western Transportation operations (i.e., mid 1930s), the Shell Oil Company operated a petroleum transfer facility near the northern corner of the Wacker property, consisting of a river dock, one building, and one above-ground storage tank (Figure 4). This facility was located on the riverfront just north of the property line, and was accessed by a road that paralleled, and was approximately 50 feet northwest of, the present day Wacker / NW Natural property line. From it's dock, the Shell operation loaded onto barge and shipped a by-product derived from the PG&C oil gasification facility (described below). Based on review of historical aerial photographs, the storage tank located at the Shell facility was removed some time between 1936 and 1940, while a portion of the Shell dock, as well as the building foundation, remain identifiable on the NW Natural property to the present time.

### 4.2.3 Pacific Gas & Coke Operations

As described both within the 1985 PDC Site History report, as well as within a June 1987 Camp Dresser & McKee, Inc. (CDM) document entitled *North Doane Lake Site Characterization Work Plan*, (CDM,1987), in 1913, PG&C constructed an oil gasification plant, known as the Gasco facility, on property immediately northwest of the present day Wacker property. The plant produced town gas and pressed lampblack briquettes which were sold in the area as fuel. In 1923, the gasification process was modified to optimize aromatic generation and light oil recovery for use as motor fuel. Tar recovery and refining were incorporated into the process in 1925 to provide tar for use as a road binder. During the 1930s, the plant expanded, and in 1941 a coking plant began production of electrode grade coke and high BTU gas. Once natural gas became available in the 1950s, much of the plant was shut down, with the last full year of plant operation occurring in 1955 (CDM, 1987). With the arrival of natural gas, PG&C changed it's name to the Northwest Natural Gas Company, and more recently to NW Natural. The Northwest Natural Gas Company constructed a liquefied natural gas (LNG) plant at the site in the late 1960's, at



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which time most of the old gasification plant was demolished and associated underground utilities were removed.

Prior to PG&C plant expansion activities that were brought on-line in 1941, waste by-products from the oil gasification process that did not have a market (wastewater with petroleum emulsions, tars, and spent oxide) were discharged to low lying areas of the site (CDM, 1987). Historical aerial photographs indicate lampblack placement and likely effluent discharge to a low area on the Gasco property south of the southernmost fuel storage tank area, which in turn discharged directly to the Willamette River (see 1936 and 1940 aerial photographs, Appendix A). RI activities completed at the Gasco facility have confirmed this occurrence, with the identification of bulk tars extending across the shoreline in this area (HAI, 1998).

Waste management practices associated with the former Gasco facility are of relevance to the adjacent Wacker property since plant expansions in the 1930s and 1940s involved the construction and use of effluent settling ponds on the southeastern portion of the Gasco property. As depicted on Figure 4, and as shown in aerial photographs taken between 1952 and 1961 (Appendix A), portions of these two effluent ponds appear to have partially extended onto the northern portion of the present-day Wacker property. These settling ponds received effluent from tar boxes and lampblack dryers (tar and oil-water emulsions), and were meant to reduce the discharge of wastes to the river. Overfill or scour from these effluent ponds, if any, would have likely migrated to low areas immediately surrounding the effluent ponds. The primary low areas adjacent to the effluent ponds were to the north, located at the north-central portion of the PG&C property, and to the south, within an approximate 400-foot wide strip of property located on the northwestern portion of the present day Wacker property.

With the construction of the above-described effluent ponds, it appears that the creek which formerly traversed the area, discharging near the present-day NW Natural / Wacker property line, was channelized and re-diverted further south, immediately adjacent to the ponded lowlands on the Wacker property. An aerial photograph taken in 1952 (Appendix A) clearly depicts the location of effluent ponds, the adjacent lowland, as well as the re-diverted creek. These features have been depicted on Figure 4.

Finally, historical aerial photographs from the 1950s and 1960s also indicate the storage or filling of the northwestern corner of the present day Wacker property with a dark-colored material (see 1952 through 1961 aerial photos, Appendix A).

Based on the preceding, the portion of the Wacker property with the greatest potential to have received impacts resulting from waste management practices associated with the former Gasco-facility appears to be limited to the lowland area along the northwestern end of the property. With regard to the effluent ponds, aerial photographs indicate that the two smaller effluent ponds extending onto the Wacker property were eliminated in the late 1960s, with another, much larger effluent pond (30,000 cubic yards), located on the present day NW Natural property, subsequently filled in the 1970s. It has been speculated (PDC, 1985) that demolition debris, as well as consolidated soils from the tar pond close-outs, may have been spread onto the former lowland portion of the present-day Wacker property, and



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perhaps incorporated into fill placed elsewhere on the site after it had been sold by NW Natural.

### 4.2.4 Filling and Site Development Activities

As provided within a Bridgewater Group report entitled *Supplement to DEQ's Strategy Recommendation for the Wacker Siltronic Facility* (Bridgewater Group, 2000), filling activities associated with the Wacker property were initiated in May 1966 and were completed by December 1975. The property owners (Rosenfeld and Anderson) had an agreement with the Spokane, Portland, and Seattle Railroad to fill the property to a minimum elevation of thirty feet by the end of 1973, and to construct industrial buildings on the property by the end of 1978 (PDC, 1985).

Approximately 1,500,000 cubic yards of imported material were placed on the property as part of filling activities (Bridgewater Group, 2000). The fill consisted of rock from a quarry located across Highway 30 immediately west of the site, as well as more than 700,000 cubic yards of material dredged from the river (from an unspecified location) by the Port of Portland (PDC, 1985). By 1967, as part of filling and site development activities, the channelized creek that formerly ran across the northwestern portion of the property had again been re-channelized to route water through a ditch and culverts around the southern edge of the Wacker property, where it currently discharges to the Willamette River at an off-site location near the location of the Railroad bridge. A 1978 aerial photograph (Appendix A) provides a view of the Wacker site subsequent to filling and prior to building construction.

Construction of Wacker's new plant began immediately after the property was purchased in 1978. Construction was completed by the end of 1979, and plant operations began in March 1980. A 1980 aerial photograph is provided in Appendix A that depicts the initial Wacker facility layout.



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## 5. POTENTIAL CONTAMINANT SOURCES

The *Strategy Recommendation* report prepared by Mr. Eric Blischke of the DEQ in October 1999 (DEQ, 1999), and the follow-up *Supplement to DEQ's Strategy Recommendation* report (Bridgewater Group, 2000), contain detailed summaries of identified site contamination, as well as a description of all known chemical releases reported to have occurred at the Wacker site. Due to the thorough nature of the preceding documents, a description of all releases known to have occurred at the Wacker facility are not repeated herein. Instead, only those known releases and/or areas of known or potential contamination that were demonstrated to be of potential relevance to Willamette River sediment impacts are described herein.

### 5.1 Former PG&C Gasco Facility

As detailed above, historical aerial photographs indicate that historical aerial photographs indicate that historical operations associated with oil gasification processes at the former Gasco site may have resulted in petroleum related contamination at the Wacker site, with the area of primary interest being the approximate 400 foot-wide strip of former low-lying property located immediately south of the present day NW Natural / Wacker property boundary (see Figure 4 and the 1952 aerial photo, Appendix A). This low area may have received discharges and overflow from adjacent effluent ponds, with potential subsequent discharge to the Willamette River via a rerouted creek that entered the Willamette River opposite a berm at the southern end of the lowland area (see Figures 4 and 1952 through 1964 aerial photos, Appendix A). As described above in Section 4.2.3, it has been speculated (PDC, 1985) that this low area may have received discharge or placement of oil-water emulsifications, tar, lampblack, spent oxide, as well as building debris. Finally, based on observations made during various geotechnical and environmental investigations completed at the Wacker site (described herein in Section 6.0), it appears possible that PG&C-related wastes may have been a component of fill placed at other portions of the Wacker property.

### 5.2 Former Western Transportation Terminal

Western Transportation, which operated a fueling dock at the southeast corner of the Wacker Facility had two large above ground fuel tanks. The occurrence or manner of leaks, spills or waste disposal activities associated with the former Western Transportation facility are unknown; however, according to DEQ (1999), an EPA analysis of a 1970 air photo concluded that soils in this area were stained. The 1970 aerial photograph (Appendix A) indicates the possible areas of discolored soils (partially obscured by shadows) to be limited to the immediate vicinity of the Western Transportation structures. No follow-up investigation activities at this portion of the site are known to have been completed.



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5.3 Olympic Pipeline

Olympic Pipeline utilizes two product lines within a utility corridor that traverses the central portion of the Wacker property (Figure 2). Of these two pipelines, one is used to transport diesel and kerosene, while the other is used to transport gasoline. In February 1979, Wacker discovered the presence of petroleum while excavating the foundation for a clarifier in the Fab 1 wastewater treatment plant area. An initial sample of impacted soil from the excavation was found to contain hydrocarbons that matched a sample of diesel fuel obtained from one of the pipelines, although a second sample apparently did not match the Olympic Pipeline product (DEQ, 1999).

Olympic Pipeline subsequently exposed their pipelines. Holes in the pipeline were found and floating oil product being identified within the utility corridor to the northwest and southeast of the clarifier excavation. Olympic pipeline replaced the leaking section of pipe, removed floating product from the excavation, and removed residual oil stained soils in the bottom of the clarifier excavation (Bridgewater Group, 2000). The approximate location of the Olympic Pipeline release is depicted on Figure 4.

## 6. SUMMARY OF PREVIOUS INVESTIGATIONS

A summary of available investigatory activities, pertinent to the Wacker site, that have been completed to date, are provided below.

6.1 Fab 1 Building Area

In August, 1977, three geotechnical test borings were installed by CH2M Hill on the Wacker parcel in the area of the current Fab 1 Process Building (Figure 3). Each boring log had multiple references to black sand and/or bitumen, possible references to lampblack, or other hydrocarbon-related materials. Additionally, a follow-up geotechnical boring installed by CH2M Hill in the Fab 1 Process Building area in 1998 (B1-B) indicated the presence of oil extending through apparent fill to a depth of approximately 50 to 55 feet below ground surface (bgs) (Figure 4). Boring B1-B was extended to the top of bedrock (basalt), which was encountered at a depth of approximately 215 feet bgs at this location.

6.2 Undeveloped, Western Property Area

CH2M Hill conducted a soil investigation at the western portion of the Wacker facility in April 1985. This investigation included the installation of seven soil borings in the vicinity of a proposed polysilicon plant in the southwestern portion of the Wacker property. Borings were installed to depths ranging from 31.5 to 41.5 feet and were completed as monitoring wells MW-1 through MW-7 (Figure 2). Soil descriptions from 4 of the 7 borings (MW-1, -2, -5, and -7) indicated the presence of oily product within surficial fill. Soil samples were collected from these borings and analyzed for oil and grease, phenols,



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VOCs, PAHs, as well as pesticides, herbicides and metals according to the extraction procedure - toxicity (EP-Tox) methodology.

Analysis of the soil samples detected the presence of VOCs, phenols (including pentachlorophenol), and PAHs. EP-Tox analysis detected low concentrations of barium (below the regulatory threshold) and levels of 2,4-dichlorophenoxy acetic acid (2,4-D) above the regulatory threshold. Oil and grease levels ranged from 300 to 3,400 ppm. Soil data are summarized in Table 2.

Groundwater samples collected from the monitoring wells MW-1 through MW-7 in July and August 1985 detected the presence of aromatic VOCs (benzene, ethylbenzene and xylene); acetone and methylene chloride (which may represent laboratory contaminants); PAHs; cyanide and low levels of metals. Groundwater data are presented in Table 3.

The identified 2,4-D, an agricultural herbicide, in soil at the Wacker property, as well as within sediments adjacent to the Wacker facility, has been attributed to Rhone-Poulenc Ag. Co. (DEQ, 1999), located upstream of the site, and is therefore has not been identified as a contaminant of interest for RI activities to be conducted by NW Natural at the Wacker site (Section 7.4.2).

In 1990, Geraghty and Miller, Inc. conducted a *Hydrogeological Investigation of the Doane Lake Area* in northwest Portland (Geraghty & Miller, 1991). The primary purpose of the study was to evaluate the hydrogeologic conditions in the vicinity of the Gould Superfund site, calculate the zone of influence of potential Gould remedies and assess the impact that groundwater quality in the Doane Lake area could have on potential Gould site remedies.

As part of the Geraghty & Miller investigation, two monitoring wells on the Wacker property were sampled. These included the existing MW-7, installed by CH2M Hill in 1985, and a newly installed intermediate depth monitoring well (MW-3I), installed at the MW-3 well cluster. MW-3I was screened from 55 to 60 feet while the existing MW-3 was screened from 12 to 27 feet. No BTEX compounds, and only low levels of phenol (0.003 ppm) and PAHs (0.215 ppm total PAHs) were detected in MW-3I, screened below the surficial fill, within the alluvial sands.

### 6.3 Fab 2 Building / Olympic Pipeline Area

In June 1990, elevated levels of VOCs and PAHs were identified within soil samples collected from two geotechnical borings that were placed in the footprint of the then proposed Fab 2 manufacturing plant. Total PAH concentrations detected in the two samples were 10,000 ppm and 6,100 ppm respectively (DEQ, 1999). As a result, Wacker retained CH2M Hill to conduct an assessment of the nearby utility corridor that contains the aforementioned Olympic Pipeline, among other lines. Assessment activities involved the installation of approximately 25 well points and 3 soil gas sampling points placed on a grid pattern using approximate 75-foot centers (CH2M HILL, 1990). The study area, located in the vicinity of the previously-described 1979 Olympic Pipeline release (Section 5.3), occupied approximately 250 feet on either side of the utility corridor, and extended along



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approximately 600 feet of the corridor. Groundwater samples were collected just below the water table at a depth of approximately 25 feet. All samples were field analyzed for BTEX and total petroleum hydrocarbons (TPH). Figure 4 depicts the approximate location of these investigatory activities.

The results of the investigation indicated elevated levels of BTEX and TPH in groundwater. Benzene concentrations ranged from non-detect to 23.3 ppm, while TPH concentrations ranged from 0.012 to 89.1 ppm. The highest concentrations of TPH and benzene were detected at a point west of, and immediately adjacent to, the pipeline utility corridor. The location of maximum BTEX concentrations were found to coincide with the area surrounding three adjacent borings where a "black viscous substance" (i.e., likely tar), was identified within the fill. Analytical results from groundwater samples indicated decreasing BTEX concentrations to the northwest and southeast along the utility corridor, with the long axis of the apparent contaminant plume extending northeast away from the corridor and towards the river. The benzene results, as well as CH2M Hill's interpretation of plume morphology, is provided within Figure 5.

CH2M Hill concluded that the source of the petroleum contamination could not be conclusively identified, but that it appeared to be gasoline-related. Based on the preceding, Olympic Pipeline subsequently uncovered the pipelines within the area of concern. No holes or leaks from the pipeline were apparent and pressure testing of the lines was inconclusive. Upon further pressure testing, one of the lines was ruptured. In March 1991 Olympic Pipeline capped both of the old lines in-place and connected approximately 2000 feet of new pipeline in March, 1991.

As part of subsequent construction activities associated with the Fab 2 foundation (occurring in 1995), approximately 5,500 tons of petroleum-contaminated soil were excavated and thermally treated with a mobile soil remediation unit. Soils were treated under a solid waste letter of authorization issued by DEQ on April 17, 1995. Treated soils were disposed of at the St. Johns Landfill in Portland, Oregon.

### 6.4 Willamette River Sediments

As stated in Section 2.0 above, the EPA conducted a sediment investigation within the Portland Harbor in 1997. The sediment investigation included the collection of 150 samples, of which 7 samples were collected adjacent to the Wacker property. A summary of constituents identified within sediments adjacent to the Wacker facility that were reported to exceed overall Portland Harbor baseline values, is provided as Table 1.

On July 29, 2000, an oil sheen was created on the Willamette River at a location immediately adjacent to the Wacker site as silt was being dredged as part of bank repair work being conducted by Wacker. According to the laboratory that analyzed samples of the dredged silt, fuel fingerprinting indicated the petroleum hydrocarbon patterns to be consistent with coal tar or creosote (Bridgewater Group, 2000). Investigatory activities associated with the dredging incident were not conducted. In total, approximately 115 tons of sediments were disposed as petroleum-contaminated waste (Bridgewater Group, 2000).



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The location of the dredging-induced sheen, located in the vicinity of the former channelized creek discharge, is depicted on Figure 4.

6.5 NW Natural – Former PG&C Gasco Facility

Since 1994, a remedial investigation has been underway at the former PG&C Gasco-facility, the property adjacent to, and northwest of, Wacker. Overall RI results indicate that the primary contaminants of interest at the Gasco site are PAH and aromatic hydrocarbon (BTEX) compounds, with contaminant concentrations and distribution correlating with the distribution of residual tar and oil at the site. With the exception of the southeastern portion of the Gasco site, where the former effluent ponds were located, it has been demonstrated that contamination is primarily restricted to soils and groundwater within the surficial fill. Impact to the underlying native alluvial sands, including limited migration of dense non-aqueous phase liquid (DNAPL), has been found to be primarily limited to the southeastern portion of the Gasco site, beneath, and down-gradient of the former effluent ponds, as well as in the vicinity of the former low area / former drainage to the south of the southern tank farm (well clusters MW-3 through MW-5, Figure 2).

A soil boring (B-33) installed through the former effluent pond near the Wacker/Gasco property line detected tar contamination into the alluvial sands to a depth of 67 feet bgs, while groundwater collected from a monitoring well (MW-5) installed along the Willamette River adjacent to the Gasco/Wacker property line at a depth of 100 feet bgs has been found to contain up to 11.4 ppm benzene and 7.4 ppm naphthalene. Groundwater samples collected from the same location, but at a depth of 175 feet bgs, consistently indicate no contamination. Based on boring B1-B, installed nearby on the adjacent Wacker property, the depth to bedrock is estimated to be approximately 205 feet bgs at the MW-5 well location.



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## 7. PRELIMINARY CONCEPTUAL SITE MODEL

A preliminary conceptual site model is presented herein based on the history of the Wacker property as well as investigations performed to date at, and in the vicinity of, the site. Phase I of the RI will be designed based on this preliminary conceptual model. The information gathered during the Phase I investigation will subsequently be utilized to modify or reconstruct the conceptual model, if necessary.

### 7.1 Land Use

The site consists of 85 acres of uplands located along the southern bank of the Willamette River. The property is zoned "IH" - Heavy Industrial, and "IHi" – Heavy Industrial with an industrial river greenway overlay zone. The utility easement that occupies a vacated, never-constructed section of NW Front Avenue transects the western portion of the property, dividing the "IHi"-zoned property to the northeast, from the "IH" –zoned property to the southwest.

### 7.2 Local Geology

The geologic units of interest at the subject site can be subdivided as follows, from youngest to oldest:

- Surficial Fill Deposits
- Alluvial Deposits

  Willamette River Deposits
  Catastrophic Flood Deposits
- Columbia River Basalt Group

#### 7.2.1 Columbia River Basalt Group

The oldest and lowermost geologic unit of interest at the site consists of the Columbia River Basalt Group. The Miocene-age Columbia River Basalt Group, composed of a series of individual lava flows, generally forms the base (bedrock) of the Portland Basin and outcrops immediately to the southwest of the Site in the Tualatin Mountains.

A significant amount of bedrock surface elevation data are available for the former Gasco site, immediately to the northwest of the Wacker property. These data indicate the basalt surface dips steeply to the northeast, with the top of the basalt occurring at a depth of approximately 36 feet bgs near the western corner of the Wacker site, to depths of 215 feet bgs



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near the northern corner of the Wacker site. Although, in general, the bedrock surface is anticipated to dip steeply from the Tualatin Hills towards the Willamette River, undulations in the surface are expected. Investigatory activities conducted by Geraghty & Miller (1991) near the southern corner of the Wacker property, as well as preliminary, unpublished results of investigatory activities completed by URS Greiner Woodward Clyde (URS) along the southeastern Wacker property boundary, indicate the presence of a trough in the bedrock surface, with the bedrock surface occurring at a depth of 115 feet bgs near the location of well WS-3 and rising towards the east corner of the Wacker site adjacent to the Willamette River, where bedrock was encountered at a depth of 63 feet bgs.

### 7.2.2 Alluvial Deposits

Overlying the eroded basalt surface at the site are Quaternary-Age alluvial deposits, composed of unconsolidated sands and silts, that range in thickness from approximately 30 feet near St. Helens Road and the southeastern portion of the site (above the bedrock mound), to an estimated thickness of greater than 200 feet adjacent to the Willamette River near the northern corner of the Wacker site. These alluvial deposits have been differentiated by Geraghty & Miller (1991), into the Catastrophic Flood Deposits and Willamette River Deposits. Since these two units may be difficult to differentiate in places, the conceptual site model groups the two units together and refers to them as undifferentiated Alluvial Deposits. The uppermost unit of the undifferentiated Alluvial Deposits in the vicinity of the site has been identified as a clayey silt by Camp Dresser (1987), while Geraghty & Miller (1991) identified both silt and clay facies associated with the upper zone of the Alluvial Deposits.

HAI (1998) encountered a laterally extensive silt unit, with typically little to no clay content, at the upper portion of the Alluvial Deposits during investigatory activities completed at the Gasco site. This silt unit was found to exhibit coloration ranging from olive gray to green, with some areas of orangish-brown mottling. Small sand lenses and rootlet zones are present within portions of the silt unit. Fine to medium-grained sands, silty sands, and relatively thin interbedded silts were encountered below the silt unit at intermediate depths within the Alluvial Deposits. Boring logs for wells MW-1 through MW-7, installed by CH2M Hill (1985) at the western portion of the Wacker site, all encountered the top of this silt unit at depths ranging from 20 to 35 feet bgs. With regard to thickness, Geraghty & Miller (1991) reports that within the Doane Lake area, the silt unit has been found to be the thickest beneath the Esco and Wacker properties. As encountered in wells and borings recently installed by URS on the southeastern portion of the Wacker property, the silt unit was found to have a thickness of greater than 35 feet. Similar thicknesses have been identified to the northwest of Wacker, near the central portion of the Gasco site.

Boring logs for wells and borings installed at the southern and southeastern portions of the Wacker site indicate the presence of much finer-grained alluvial material than have been identified at the northern portions of the property, with silts and occasional sand zones extending all the way to the bedrock surface.



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The existence of a northwest-southeast trending depression in the top of the silt unit is apparent across the central portion of the Gasco site. The depression appears to be oriented roughly parallel to the location of a former creek bed, and is thought to be a former drainage feature associated with Doane Lake. Assuming that the observed depression does correlate with the historic creek bed, then it would be expected that this depression in the surface of the silt extends across the western portion of the Wacker property, to the vicinity of the former Doane Lake remnant.

### 7.2.3 Surficial Fill Deposits

As described in Section 4.2 herein, approximately 1,500,000 cubic yards of imported material were placed on the property as part of filling activities (Bridgewater Group, 2000). The fill consisted of rock from the quarry located across Highway 30 immediately west of the site, as well as more than 700,000 cubic yards of material dredged from an unknown portion of the Willamette river by the Port of Portland (PDC, 1985). Aerial photographs show a dark material at the western corner of the Wacker property. This material may represent fill from the PG&C Gasco operations. Surficial fill thicknesses ranging from 10 to 30 feet across the Wacker site are likely. Based on a review of available boring logs for the Wacker site, it appears that much of the fill consists of poorly graded sands and silty sands. In addition, references to bitumen and tar, potential byproducts from the oil gasification process, have been identified within the surficial fill unit at portions of the site.

## 7.3 Local Hydrogeology

Groundwater is deemed likely to occur in three principal hydrologic zones at the site including the unconfined Surficial Fill water-bearing zone (WBZ), the semi-confined Alluvial Sand WBZ, and the confined bedrock aquifers in the Columbia River Basalts. Based on available boring log data from the Wacker, Gasco, and adjacent properties to the south, it is anticipated that a laterally extensive low permeability silt unit separates the Surficial Fill WBZ from the Alluvial Sand WBZ across a majority of the site. The hydraulic conductivity of the silt unit at the Wacker site, as determined from slug testing at well MW-3I, was calculated as $3.22 \times 10^{-5}$ cm/sec, indicating that the silt unit is not highly conductive (Geraghty & Miller, 1991).

With respect to the overall regional groundwater flow regime in the vicinity of the Wacker site, it is anticipated that the Tualatin Mountains form a regional groundwater recharge area to the southwest of the site, while the Willamette River likely forms a regional groundwater discharge boundary to the northeast, acting as a hydraulic barrier to groundwater flow to the opposite side of the river.

In the southern portion of the site, groundwater has been encountered in the Surficial Fill WBZ at depths of 14 to 25 feet bgs. In the area of the site's monitoring well network, groundwater flow within the surficial fill WBZ appears to generally be to the southeast towards North Doane Lake. However, since the site's monitoring well network covers



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only a portion of the site, information regarding overall groundwater flow is not available. Local topography, in addition to extensive groundwater flow data available to the northwest and southeast of the Wacker site, suggest that the overall site groundwater flow direction within both the Surficial Fill WBZ and the Alluvial Sand WBZ, should generally be to the northeast, toward the Willamette River.

## 7.4 Contaminant Source, Transport, and Fate

### 7.4.1 Potential Contaminant Sources

The primary potential sources of sediment-related contamination at the Wacker property, as described in Section 5, are as follows:

- Oil gasification waste placement within former PG&C effluent settling ponds;
- Oil gasification waste placement within the filled northern lowland area, or mixed with fill elsewhere on the site;
- Potential direct discharge to Willamette River sediments of PG&C oil gasification wastes via overflow, flood scour, and clean-out of effluent settling ponds;
- Undocumented spills and waste management practices associated with the Former Western Transportation fuel terminal;
- Olympic Pipeline-related releases;

### 7.4.2 Contaminants of Interest

Contaminants of Interest (COIs) have been identified, with few exceptions, as those constituents identified within the *Strategy Recommendation* Report (DEQ, 1999) as being present within sediments adjacent to the Wacker site at concentrations considered to exceed the Portland Harbor baseline maximum values. Exceptions include the addition of the aromatic hydrocarbons (BTEX) and total cyanide to the COI list, all of which have previously been identified in site groundwater, but have not been analyzed in sediments. Conversely, metals, herbicides, pesticides, phenols, and phthalates, identified within the DEQ *Strategy Recommendation* document as being present within adjacent sediments at concentrations exceeding the Portland Harbor Baseline, are not considered to be COIs for the purpose of this RI. Rationale for the elimination of these constituents as COIs pertaining to Wacker operations has previously been documented within the *Supplement to DEQ's Strategy Recommendation* (Bridgewater, 2000), and is therefore not repeated herein. Furthermore, herbicides, pesticides, phthalates, and phenols, including pentachlorophenol, have not been identified as contaminants resulting from historic PG&C operations, and as such do not appear attributable to potential PG&C-related contaminant sources. Ecological risk evaluation studies completed to date with regard to



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sediments at the NW Natural site indicate that metals concentrations, only slightly greater than the Harbor Baseline Maximum as reported by DEQ, do not appear to pose unacceptable risks. As such, additional investigatory activities related to metals do not appear warranted.

Based on the preceding, the potential COIs for the Wacker RI have been identified as follows:

- Polynuclear aromatic hydrocarbons (PAHs);
- Carbozole, dibenzofuran, and 2-methylnaphthalene;
- Volatile aromatic compounds (VOCs), including benzene, toluene, ethylbenzene, xylenes (BTEX);
- Total Cyanide

It is noted that once permanent monitoring wells are installed at the site, confirmation of the preceding COI list will be conducted by the completion of expanded analyses at select well locations. However, based on the nature of the potential contamination present at the Wacker property, the presented COI list will be adequate for the identification and evaluation of contaminant migration pathways into the Willamette River.

### 7.4.3 Transport and Fate

Because contaminant type (petroleum-related); mode of release (spillage to the ground, incorporation within fill); and the hydrogeological framework (sand fill overlying an alluvial silt layer, below which are alluvial sands) at both the Wacker and Gasco facilities appear to have similarities, contaminant transport and fate processes are also expected to be similar. Accordingly, it will be possible to streamline the Wacker RI to target specific zones within the subsurface that have been demonstrated to be zones for primary contaminant transport at the Gasco facility.

Based on RI results at Gasco, the most wide-spread contaminant impacts have been found to occur within the Surficial Fill WBZ, while more limited impacts have been identified within the underlying Alluvial Sand WBZ. The silt unit, underlying the Surficial Fill WBZ and defining the top of the alluvial deposits, has acted as a semi-confining unit across the majority of the Gasco site and has prevented the vertical migration of contaminants to the underlying Alluvial Sand WBZ in most areas. There is limited impact to the upper portion of the Alluvial Sand WBZ down-gradient of the primary area of former waste placement (i.e., former effluent ponds). Specifically, contaminants have been detected in this region of the Alluvial Sand WBZ from the top of the unit (approximately 45 feet bgs) to maximum depths of between 100 to 150 feet bgs. Groundwater samples collected from the lower portion of the Alluvial Sand WBZ in this area are consistently free of chemical impact.



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Based on the understanding of contaminant migration at the Gasco site, dissolved phase contamination from any of the identified potential contaminant sources on the Wacker property, or from contaminated fill in general, would be expected to be limited to the Surficial Fill WBZ and/or to the upper 50 to 100 feet of the alluvial sand WBZ.

With regard to non-aqueous phase product (NAPL), based on the history of former PG&C waste management practices, as well as a review of historical aerial photographs (Section 4.2.3), it is possible that tar wastes may have been historically placed within the northern lowland portion of the Wacker site, with possible periodic discharge into the river via scouring or overflow into the adjacent channelized creek. As observed at the Gasco site, the historic placement of these materials directly adjacent to, and within, the river, may add some complexity with regard to the differentiation of historic placement versus potential ongoing contaminant releases to Willamette River sediments. However, if NAPL is identified at the shoreline, sediment and porewater-related investigatory activities being developed for the Gasco site could be extended to the Wacker site, if deemed necessary to adequately evaluate the nature and magnitude of ongoing releases.

The preceding provides a description of the anticipated transport of dissolved phase as well as potential NAPL migration, from contaminant sources to Willamette River sediments. Additional migration pathways for contaminants of interest at the Wacker site would include overland transport and erosion of contaminated fill along the riverbank and via ditches or other stormwater effluent conveyances that may cross the site and discharge to the river. Additionally, the possibility exists for preferential migration of dissolved and/or NAPL contamination via buried utilities that migrate across the site and discharge to the Willamette River. Maps depicting all on-site drainage features, discharges to the Willamette River, and buried utilities, have been requested from Wacker.



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## 8. PROPOSED RI APPROACH

The objectives of the proposed RI activities at the Wacker site are as follows:

1) To identify, characterize, and estimate the magnitude of any ongoing unpermitted discharges from the Wacker site to the Willamette River sediments.

2) To obtain sufficient information to allow for an evaluation of the need to implement source control measures at the site necessary to prevent the ongoing discharge of unacceptable levels of contaminants, if any, to Willamette River sediments.

The Remedial Investigation will likely be performed in two phases. The Phase I investigation will gather the basic information necessary to adequately address the first objective identified above, while a second phase of investigatory activities may be necessary to more fully evaluate the need for, or options associated with, the second objective (source control).

As further described below in Section 10, individual investigatory components that will be necessary to meet the RI objectives described above, will include the following:

1) Collection of hydrogeological and contaminant field screening data using deep soil borings installed at spatially critical locations along the Willamette River shoreline. The preceding, in conjunction with the existing site conceptual model, will ensure that the most likely migration pathways for dissolved and NAPL contamination are targeted for chemical evaluation.

2) Completion of chemical analyses on depth-discrete soil and groundwater samples collected from temporary well points installed along the Willamette River shoreline at locations down-gradient of potential sources, and within zones of potential preferential contaminant migration, to allow for preliminary characterization of extent and magnitude of contaminants that may be discharging to Willamette River sediments.

3) Collection of seasonal groundwater quality and groundwater elevation data at permanent well installations intercepting, and defining the limits of, zones of contaminant migration to Willamette River sediments.

4) Extension of the existing bathymetric survey for the Willamette River adjacent to the NW Natural Gasco facility, past the Wacker facility and to the location of the Burlington Northern railroad bridge.

5) Identification and sampling of site outfalls/discharges into the Willamette River for COIs.



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6) Sampling of surface soils at locations along the river embankment that appear to have the potential for overland transport and erosion into the Willamette River.

Data collected from the preceding tasks will be evaluated as described herein within Section 9.0 (Source Control Evaluation). Based on the findings of the source control evaluation, and as deemed necessary for the completion of source control evaluation activities at the adjacent Gasco facility, it is possible that focused Phase II RI activities may be necessary to allow a determination as to whether ongoing contaminant discharges from the uplands portion of the site may be resulting in unacceptable impact to Willamette River sediments. A description of possible Phase II RI activities, including identification of the Phase I results that may lead to these additional activities, is provided below.

1) Conduct investigatory activities at portions of the site to characterize the source of identified contaminant discharges to Willamette River sediments. Source area investigatory activities would likely be deemed necessary under either of the following two scenarios:

   - The nature and extent of contamination identified in the vicinity of the surface water / groundwater interface does not fit the conceptual site model, and source area characterization is deemed necessary for ensuring that potential migration pathways to the river have been adequately characterized.

   - Results of the Source Control Evaluation indicate the presence of on-going contaminant discharges that may be adversely impacting sediments, and source area characterization is needed to adequately identify and evaluate control measure options.

2) Complete investigatory activities within Willamette River sediments, as necessary, to allow one to distinguish between impacts that may be attributable to either historic placement / sedimentation or ongoing contaminant releases to the Willamette River sediments.

3) Fill other data gaps as may be identified during Phase I.



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## 9. SOURCE CONTROL EVALUATION

Subsequent to the completion of Phase I RI activities, a technical memorandum on source control measures will be prepared that presents and evaluates all data relevant to the characterization of confirmed contaminant migration pathways from the Wacker property to Willamette River sediments. The source control evaluation will likely be presented as a supplement to, or an extension of, the source control evaluation that is ongoing at the adjacent NW Natural Gasco facility. Components to be included within the Source Control Evaluation are as follows:

- Confirmation of contaminant migration pathways from the Wacker property to the Willamette River sediments.
- Characterization of identified migration pathways from the Wacker property to Willamette River sediments.
- An estimate of the potential magnitude of chemical migration, if any, from the Wacker property to Willamette River sediments.
- An evaluation of the need for source control measures to prevent the ongoing migration of chemicals, if any, from the Wacker site to Willamette River sediments.
- If source control is deemed necessary, then alternatives for source control measures will be identified and evaluated.

## 10. CONCEPTUAL PHASE I RI WORKPLAN

The following subsections summarize the various activities to be performed at the Wacker site as part of Phase I RI activities.

### 10.1 Groundwater Pathway Investigation

The groundwater pathway investigation will include the collection of depth discrete soil and groundwater samples at down-gradient portions of the site, near the groundwater / surface water interface with the Willamette River. These investigatory activities will include an evaluation of soil and groundwater quality across the entire riverfront portion of the Wacker property, with additional emphasis on those areas known to be either down-gradient of a potential contaminant source, and/or within a zone of potential preferential migration (i.e., filled creek channel, utility corridor backfill). Investigation activities will include: 1) detailed screening of the soil column at each boring location for the presence of contamination, with an emphasis on NAPL or residual product identification; 2) collection and analysis of soil samples from zones of likely impact; 3) collection and



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analysis of depth discrete groundwater samples from zones of likely impact; and 4) seasonal groundwater monitoring and flow direction determinations.

10.1.1 Push Probe Investigation

As depicted on Figure 6, it is proposed that 9 push probe borings (P-1 through P-9) be installed with a lateral spacing of between 150 and 350 feet along the Wacker shoreline. It is proposed that 7 of the locations be utilized for collection of depth-discrete groundwater samples. As depicted on Figure 6, groundwater samples will be collected along virtually the entire Wacker / Willamette River shoreline, with emphasis on portions of the site down-gradient of the former effluent ponds / filled lowland (P-2 through P-4), and the former Western Transportation fueling facilities (P-7 and P-8). Push probe boring P-3 is also placed such that it will evaluate soil and groundwater quality at the location of the historic creek/ditch discharge. Other push probe borings (P-5 and P-6) will provide a continuity of soil and groundwater quality data across the shoreline, to assist in identifying the lateral and vertical subsurface distribution of contaminants across the shoreline (visual and chemical).

No groundwater collection activities have been proposed for borings installed at the extreme northern and eastern corners of the property (P-1 and P-9), where existing wells located immediately beyond these property lines (MW-5 to the northwest, and RP-01 to the southeast), provide adequate groundwater quality coverage. It is noted that proposed boring locations may be shifted slightly and/or additional locations may be added to target potential zones of preferential contaminant migration, once information becomes available to indicate the location of such zones (i.e., backfilled underground utilities). This information is not available at the time of this writing, but will be available prior to preparation of the Phase I RI Work Plan. Also, if free product is encountered within the surficial fill unit at any push probe location, it will not be possible to extend these borings to the full proposed depth due to potential cross-contamination issues. In such an occurrence, alternatives such as using a hollow-stem auger rig for boring installation, will be evaluated relative to the actual site conditions encountered.

With regard to the proposed push probe borings, it is anticipated that multiple borings will be installed at each specified location, with the first boring used to collect soil samples as well as detailed hydrogeological and contamination profile information (based on field screening and visual observation). In this regard, continuous soil cores will be collected at all push probe borings to a minimum depth of 64 feet bgs, allowing for a detailed description and screening of soils across the water table, through the Surficial Fill WBZ, and into the upper Alluvial Sand WBZ. Sampling activities will be extended to greater depths at locations where field screening would indicate contamination extends through the targeted completion depth. To evaluate deeper flow paths, four of the preceding push probe borings (P-2, P-3, P-5, and P-8) will be further advanced to a depth of 100 feet bgs, with soil samples to be collected approximately every 10 feet below the continuously-cored portion of the borehole.



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At all locations where groundwater sampling is proposed (P-2 through P-8), depth discrete groundwater samples will be collected at key depth horizons, to be selected based on the soil profile observed at each location. Based on the existing Site Conceptual Model, key depth intervals to sample at all locations include Surficial Fill WBZ (at the water table, estimated depth of 20 to 24 feet bgs), as well as the upper portion of the Alluvial Sand WBZ (approximately 60 to 64 feet bgs). Additionally, to characterize deeper flow zones across the riverfront, 4 probes (P-2, P-3, P-5, and P-8) will be advanced to a depth of approximately 100 feet bgs for the collection of groundwater samples within the intermediate Alluvial Sand WBZ.

Groundwater samples collected during the above investigatory activities will be analyzed for PAHs and BTEX compounds, select COIs that have been found to be good indicators of the presence and magnitude of impacts that may be associated with the suspected sources. Additionally, a minimum of one soil sample per boring (selected by field screening) will be analyzed for COIs, with additional samples to be selected for more focused analyses if necessary for defining vertical contaminant extent.

### 10.1.2 Monitoring Well Installation

Subsequent to the completion of the push probe investigatory activities described in Section 10.1.1, a specific proposal for monitoring well installation will be prepared and submitted to the DEQ. Specific monitoring well locations and depths will be such that the contaminant plume, and/or NAPLs, if any, will be monitored within the anticipated zone of greatest flux into the river. Additional wells will be clustered at each location, as necessary, to provided vertical plume definition.

A preliminary monitoring plan includes the installation of 5 new well clusters at the Wacker site (WS-8 through WS-12). Of these wells, it is anticipated that 4 clusters will be installed along the riverfront, while 1 will be installed at the central portion of the site (Figure 6). The primary purpose of the cluster installed at the central portion of the site would be to supplement existing coverage with regard to groundwater elevation and flow direction, necessary for an evaluation of potential contaminant flux into the river.

Currently, it is anticipated that each of the five anticipated well clusters will consist of two wells, one screened within the Surficial Fill WBZ, and the second screened within the upper Alluvial Sand WBZ. This conceptual well installation plan will be modified, as necessary to meet the RI objectives, based on actual site conditions encountered during the push probe investigatory activities.

Groundwater samples collected from each of the monitoring wells will initially be analyzed for the full suite of COIs, as well as other parameters (i.e., cations and anions) that may be deemed helpful with regard to evaluating groundwater flux to the river.



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10.1.3 Groundwater Monitoring

Monitoring of static water levels in the monitoring wells will be performed on a quarterly basis to gather information on seasonal fluctuations of the water table and hydraulic gradients. River stage data will also be collected at the same time to determine hydraulic continuity with the Willamette River. Water levels at the Wacker site will be collected synchronously with water level collection activities at the adjacent NW Natural site, such that overall groundwater flow direction in the area can best be determined.

In addition, quarterly monitoring of water quality parameters will be performed at selected monitoring wells over the course of one year to establish if there are any seasonal fluctuations or long-term trends of the contaminant concentrations in the groundwater.

10.2 Surface Pathway Investigation

To evaluate the potential for contaminant migration into sediments adjacent to the Wacker site via overland flow and erosion, soil samples will be collected at the ground surface at those locations located along the river embankment where such processes appear most likely to occur. Prior to RI Work Plan preparation, the Wacker shoreline will be inspected to evaluate the potential occurrence and location of these processes. If no areas of preferential flow or erosion are identified, then the default will be to collect surface samples at each of the 9 proposed push probe locations. Specific locations, including rationale, will be provided within the RI Work Plan. In addition to the preceding, soils located immediately below any on-site outfalls to the river, as well as a sample of the discharge (wastewater treatment plant effluent and/or stormwater), will be collected. Surface soil samples will be analyzed for nonvolatile COIs, while direct discharges will be analyzed for the full suite of COIs.

10.3 Willamette River Bathymetric Survey

To assist in interpretation of soil and groundwater sampling results in relation to identified sediment impacts at the Wacker site, extension of the existing bathymetric survey for the Willamette River adjacent to the NW Natural Gasco facility will be conducted, past the Wacker facility and to the location of the Burlington Northern railroad bridge.



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## 11. GLOSSARY OF ABBREVIATIONS

| | |
|---|---|
| bgs | below existing ground surface |
| BNSF | Burlington Northern / Santa Fe Railroads |
| BTEX | benzene, toluene, ethylbenzene, and xylenes |
| CDM | Camp Dresser & McKee, Inc. |
| cm | centimeter |
| COIs | contaminants of interest |
| DEQ | Oregon Department of Environmental Quality |
| DNAPL | dense non-aqueous phase liquids |
| EPA | U.S. Environmental Protection Agency |
| HAI | Hahn and Associates, Inc. |
| KII | Koppers Industries, Inc. |
| LNG | liquefied natural gas |
| NAPL | non-aqueous phase liquid |
| NPL | National Priority List |
| PAHs | polynuclear aromatic hydrocarbons |
| PCBs | polychlorinated biphenyls |
| PDC | Portland Development Commission |
| PG&C | Portland Gas & Coke |
| PGE | Portland General Electric |
| RI | Remedial Investigation |
| RM | river mile |
| SVOCs | semi volatile organic compounds |
| TBT | organotins |
| TOC | total organic carbon |
| TPH | total petroleum hydrocarbons |
| URS | URS Greiner Woodward Clyde, Inc. |
| VOCs | volatile organic constituents |
| Wacker | Wacker Siltronic Corporation |
| WBZ | water-bearing zone |



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## 12. REFERENCES

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# TABLES

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**TABLE 1**

**Constituents In Sediments Reported by DEQ to Exceed Apparent Portland Harbor Baseline Values**

Remedial Investigation Scoping Document

Wacker Siltronic Corporation

7200 NW Front Avenue

Portland, Oregon

<------- Downstream <------- Downstream

Project No. 5237

| Sediment Sample Location -> | **Adjacent to NW Natural Former Gasco Site** | | | | | **Adjacent to Wacker Siltronic Site** | | | | | | | **Upstream** | | **Harbor Baseline Maximum** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sediment Sample Number -> | | | | | | | | | | | | | | | |
| **Analyte** | SD062 | SD063 | SD064 | SD065 | SD067 | SD068 | SD069 | SD070 | SD072 | SD072A | SD075 | SD077 | SD078 | SD080 | |
| **Metals (mg/kg)** | | | | | | | | | | | | | | | |
| Beryllium | 0.7 | 0.7 | **0.6** | 0.7 | 0.7 | 0.65 | 0.7 | 0.7 | 0.6 | 0.6 | **0.9** | 0.7 | 0.5 | 0.7 | 0.7 |
| Cobalt | **20.1** | 18.2 | 18.6 | 19. | 17.8 | 18.2 | **21.3** | **20.3** | 18.4 | **24.6** | **23.9** | **21.3** | 15.4 | 18.3 | 19.7 |
| Iron | 44,500. | 44,400. | **43,100.** | 43,100. | 43,800. | 44,100. | **54,200.** | **53,000.** | **51,900.** | **53,900.** | **64,500.** | **58,600.** | 41,400. | 44,200. | 45,000. |
| Manganese | 636. | 750. | **840.** | 699. | 624. | 681. | 725. | 638. | 591. | **863.** | **909.** | 605. | 487. | 693. | 810. |
| Selenium | 13. | 13. | 14. | 11. | **17.** | 12. | **17.** | **17.** | **16.** | 14. | **17.** | 14. | 11. | 14. | 15. |
| Silver | 1.2 | 1.3 | 1.2 | 1. | 1.2 | 1.2 | **1.5** | 1.4 | 1.3 | 1.3 | **1.7** | **1.6** | 1. | 1.2 | 1.4 |
| Titanium | - | - | - | - | - | - | - | **2,840.** | **2,740.** | **2,850.** | - | **3,200.** | - | - | 2,075. |
| Vanadium | **122.** | **115.** | 104. | 107. | **113.** | 110. | **136.** | **132.** | **125.** | **136.** | **152.** | **147.** | 89.1 | 106. | 112. |
| Zinc | **161.** | **185.** | **125.** | 104. | **150.** | **134.** | **144.** | 117. | 113. | **145.** | **120.** | **124.** | 100. | **131.** | 118. |
| **Organics (ug/kg)** | | | | | | | | | | | | | | | |
| 2-Methylnaphthalene | **18,000.** | **680.** | **44,000.** | **11,000.** | **7,600.** | **2,700.** | **210.** | **530.** | 130. | **980.** | **180.** | **430.** | 24. | 19. | 150. |
| Bis(2-ethylhexyl)phthalate | 210.U | 130.U | 340.U | 200.U | 200.U | 150. | 76. | 94. | 210. | 260. | **700.** | 180. | 210. | 260. | 390. |
| Carbazole | **8,400.J** | **260.J** | **5,500.** | **3,600.** | **1,800.** | **1,700.J** | **3,400.J** | **2,000.EJ** | 86J | **660.** | **170.J** | **700.J** | 40.J | 19.U | 100. |
| Dibenzofuran | **2,600.** | **530.** | **3,700.** | **1,600.** | **1,300.** | **700.** | **1,900.** | **2,600.** | **220.** | **3,600.** | **340.** | **160.** | 20. | 19.U | 100. |
| Pentachlorophenol | 980.UJ | 97.UJ | 970.UJ | 480.UJ | 1,000.U | 98.UJ | 98.UJ | 94.UJ | 99.UJ | 530.U | **7.1** | **6.4** | 4.6 | 11. | Detect |
| LPAHs | **211,460.** | **26,970.** | **402,400.** | **165,600.** | **112,400.** | **60,430.** | **65,680.** | **70,574.** | **4,995.** | **31,500.** | **13,490.** | **6,860.** | 425. | 337. | 700. |
| HPAHs | **524,200.** | **57,600.** | **420,200.** | **268,800.** | **192,000.** | **89,800.** | **58,390.** | **46,990.** | **8,630.** | **18,850.** | **15,260.** | **9,060.** | **3,034.** | 2,134. | 2,400. |
| 2,4-D | - | - | - | - | - | - | - | - | - | - | **9.** | **24.** | **21.** | **93.** | <3.3 |
| 2,4-DB | - | - | - | - | - | - | - | - | - | - | **19.** | **13.** | **23.** | **130.** | <5. |

Note: Bold and shaded indicates analyte was detected at a concentration greater than the apparent Portland Harbor Baseline maximum value.

J = The analyte was positively identified and detected: howver, the concentration is an estimated value because the result is less than quantitation limits or quality control criteria were not met.

U = The analyte was not detected at a concentration greater than the reported method detection limit.

HPAHs = high molecular weight PAHs

LPAHs = low molecular weight PAHs

mg/kg = milligrams per kilogram

ug/kg = micrograms per kilogram



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**TABLE 2**

**Results of Soil Sampling: Wells WS-1 through WS-7**

**Collected by CH2M Hill on April 30, 1985**

Remedial Investigation Scoping Document

Wacker Siltronic Corporation

7200 NW Front Avenue

Portland, Oregon

Project No. 5237

| | Analytical Results (mg/kg) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Sample Location -> | WS-1 | WS-2 | WS-3S | WS-4 | | WS-5 | WS-6 | WS-7 | |
| Sample Number -> | S-3 | S-4 | S-5 | S-1 | S-7 | S-2 | S-3 | S-5 | S-8 |
| Screen Depth (feet bgs)-> | 15 | 20 | 25 | 5 | 35 | 10 | 16 | 25 | 40 |
| Chlorobenzene | 0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 |
| o-Cresol | 0.04 | 3.4 | ND | 0.02 | ND | 0.19 | 0.05 | ND | ND |
| m+p-Cresols | 0.01 | ND | ND | 0.08 | ND | ND | ND | ND | ND |
| 2,4-Dimethylphenol | ND | 3.1 | ND | ND | ND | 0.22 | 0.17 | ND | ND |
| 2-Nitrophenol | ND | 0.2 | ND | ND | ND | ND | ND | ND | ND |
| 2,4-Dinitrophenol | ND | ND | ND | ND | ND | 0.81 | ND | ND | ND |
| 2-Chlorophenol | ND | 7.8 | 0.08 | 0.26 | ND | ND | 0.13 | ND | 0.14 |
| 3+4-Chlorophenols | 0.44 | 17.5 | 0.06 | ND | ND | 1.7 | 0.32 | ND | ND |
| 2,4-Dichlorophenol | ND | 2.7 | ND | ND | ND | 0.24 | ND | ND | ND |
| 2,4,5-Trichlorophenol | ND | 1.9 | ND | ND | ND | ND | ND | ND | ND |
| 2,4,6-Trichlorophenol | ND | ND | ND | ND | ND | 0.22 | ND | ND | ND |
| 2,3,4,5-Tetrachlorophenol | 4.9 | 256. | ND | 0.4 | ND | 0.23 | 4.7 | 0.06 | 0.25 |
| 2,3,4,6-Tetrachlorophenol | 0.24 | ND | ND | ND | ND | ND | ND | 1. | ND |
| 2,3,5,6-Tetrachlorophenol | ND | 4. | ND | 0.58 | 0.11 | 0.33 | 0.55 | ND | 0.46 |
| Pentachlorophenol | ND>1 | ND>1 | ND>1 | ND>1 | 0.31 | 6.9 | 5.1 | ND>1 | ND>1 |
| Phenol | 0.35 | 3.1 | 0.2 | 0.3 | 0.17 | 0.07 | 0.05 | 0.06 | 0.08 |
| 2,4-D (EP-Tox) | ND>10 | ND>10 | ND>10 | ND>10 | ND>10 | 10. | 160. | ND>10 | ND>10 |
| Oil and Grease | 3,400. | 1,500. | 590. | 9,140. | 300. | 1,900. | 540. | 650. | 590. |

Note: LPAHS = low molecular weight PAHs

HPAHS = high molecular weight PAHs

mg/KG = miligrams per Kilogram

ND = not detected at a concentration above method detection limits



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TABLE 2

**Results of Soil Sampling: Wells WS-1 through WS-7**

**Collected by CH2M Hill on April 30, 1985**

Remedial Investigation Scoping Document

Wacker Siltronic Corporation

7200 NW Front Avenue

Portland, Oregon

Project No. 5237

| | Analytical Results (mg/kg) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Sample Location -> | WS-1 | WS-2 | WS-3S | WS-4 | | WS-5 | WS-6 | WS-7 | |
| Sample Number -> | S-3 | S-4 | S-5 | S-1 | S-7 | S-2 | S-3 | S-5 | S-8 |
| Screen Depth (feet bgs)-> | 15 | 20 | 25 | 5 | 35 | 10 | 16 | 25 | 40 |
| **PAHs** | | | | | | | | | |
| Acenaphthene | 8. | 560. | ND>1 | ND>1 | ND>1 | 28. | ND>1 | ND>1 | ND>1 |
| Acenaphthylene | 5.6 | 230. | ND>1 | ND>1 | ND>1 | 24. | ND>1 | ND>1 | ND>1 |
| Benzo(a)pyrene | 19. | 120. | ND>1 | ND>1 | ND>1 | 100. | ND>1 | ND>1 | ND>1 |
| Benzo(b+k)fluoranthene | 8. | 120. | ND>1 | ND>1 | ND>1 | 200. | ND>1 | ND>1 | ND>1 |
| Benzo(g,h,I)perylene | ND>1 | 360. | ND>1 | ND>1 | ND>1 | 25. | ND>1 | ND>1 | ND>1 |
| Chrysene | 12. | 92. | ND>1 | ND>1 | ND>1 | 36. | ND>1 | 1.7 | ND>1 |
| Fluoranthene | 16. | 530. | ND>1 | ND>1 | ND>1 | 50. | ND>1 | 1.1 | ND>1 |
| Fluorene | 5. | 290. | ND>1 | ND>1 | ND>1 | 20. | ND>1 | ND>1 | ND>1 |
| Indeno(1,2,3-c,d)pyrene | ND>1 | 270. | ND>1 | ND>1 | ND>1 | 7. | ND>1 | ND>1 | ND>1 |
| Naphthalene | 6.7 | 360. | ND>1 | ND>1 | ND>1 | 230. | ND>1 | ND>1 | ND>1 |
| Phenanthrene+Anthracene | 32. | 1,400. | 3. | ND>1 | ND>1 | 150. | ND>1 | 1.6 | ND>1 |
| Pyrene | 18. | 550. | ND>1 | ND>1 | ND>1 | 57. | ND>1 | 1.2 | ND>1 |
| Total Low PAHs | 57.3 | 2,840. | 3. | ND | ND | 452. | ND | ND | ND |
| Total High PAHs | 73. | 2,042. | ND | ND | ND | 475. | ND | 2.8 | ND |

Note:

LPAHS = low molecular weight PAHs

HPAHS = high molecular weight PAHs

mg/KG = miligrams per Kilogram

ND = not detected at a concentration above method detection limits

SCOEPA00010771

TABLE 3
Results of Groundwater Sampling: Wells WS-1 through WS-7
Collected by CH2M Hill and Others
Remedial Investigation Scoping Document
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| | Analytical Results (mg/l) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Sample Location -> | WS-1 | WS-2 | WS-3S | WS-3I | WS-4 | WS-5 | WS-6 | WS-7 | |
| Date Sampled | (8/85) | (8/85) | (8/85) | (10/90) | (8/85) | (8/85) | (8/85) | (8/85) | (10/90) |
| Screen Interval (feet bgs)-> | 7 - 22 | 7 - 22 | 12 - 27 | 75 - 80 | 7 - 20 | 5 - 20 | 9 - 24 | 10 - 25 | |
| Volatile Aromatic Compounds | | | | | | | | | |
| Benzene | 1.100 | 0.100 | 0.390 | ND | ND | ND | 1.200 | ND | ND |
| Toluene | ND | ND | ND | ND | ND | ND | | ND | ND |
| Ethylbenzene | 0.410 | ND | ND | ND | ND | ND | 0.350 | ND | ND |
| Xylene (Total) | 1.200 | 0.032 | ND | ND | 0.015 | ND | 0.430 | ND | ND |
| Semivolatile Organic Compounds | | | | | | | | | |
| Phenol | ND | ND | ND | 0.003 | ND | ND | ND | ND | ND |
| 2,4-Dimethylphenol | 0.027 | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-Methylnaphthalene | | 0.260 | 0.067 | | 0.019 | 0.012 | 0.041 | ND | ND |
| Acenapthene | 0.270 | 0.940 | 0.086 | 0.093 | 0.350 | 0.054 | 0.200 | 0.019 | 0.002 |
| Acenaphthylene | 0.088 | 0.200 | ND | 0.002 | ND | 0.031 | 0.032 | ND | ND |
| Anthracene | 0.039 | 0.630 | ND | 0.002 | ND | ND | ND | ND | ND |
| Benzo(a)anthracene | 0.031 | 0.480 | ND | ND | ND | ND | ND | 0.012 | ND |
| Benzo(a)pyrene | 0.040 | 0.760 | ND | ND | ND | ND | ND | 0.010 | ND |
| Benzo(b)fluoranthene | 0.024 | 0.400 | ND | ND | ND | ND | ND | ND | ND |
| Benzo(ghi)perylene | 0.025 | 0.370 | ND | ND | ND | ND | ND | ND | ND |
| Benzo(k)fluoranthene | ND | 0.120 | ND | ND | ND | ND | ND | ND | ND |
| Chrysene | 0.036 | 0.650 | ND | ND | ND | ND | ND | 0.015 | ND |
| Dibenzo(ah)anthracene | ND | ND | ND | ND | ND | ND | ND | | ND |
| Indeno(123-cd)pyrene | 0.020 | 0.300 | ND | ND | ND | ND | ND | ND | ND |
| Dibenzofuran | 0.077 | 0.075 | ND | 0.004 | ND | ND | 0.024 | ND | 0.003 |
| Fluoranthene | 0.073 | 1.380 | ND | 0.005 | ND | ND | ND | 0.023 | 0.003 |
| Fluorene | 0.095 | 0.440 | 0.013 | 0.022 | 0.053 | 0.012 | 0.035 | ND | 0.003 |
| Naphthalene | ND | 1.900 | 0.600 | 0.770 | 0.350 | 0.058 | 2.100 | ND | 0.005 |
| Phenanthrene | 0.190 | 0.630 | 0.013 | 0.006 | 0.028 | 0.021 | 0.056 | ND | ND |
| Pyrene | 0.081 | 1.430 | ND | 0.004 | 0.014 | 0.010 | 0.010 | 0.011 | ND |
| LPAHs | 0.176 | 3.080 | ND | ND | ND | ND | ND | 0.037 | ND |
| HPAHs | 0.913 | 7.885 | 0.779 | 0.908 | 0.814 | 0.198 | 2.498 | 0.053 | 0.016 |
| Chlorinated Pesticides | | | | | | | | | |
| Alpha-BHC | ND | ND | ND | ND | 0.240 | ND | 0.060 | ND | ND |
| 4,4'-DDT | ND | ND | ND | ND | ND | ND | 0.280 | ND | ND |
| Endrin | ND | ND | ND | ND | ND | 0.020 | ND | ND | ND |
| Dissolved Inorganics | | | | | | | | | |
| Lead | 0.052 | 0.040 | 0.025 | ND | 0.049 | 0.028 | 0.030 | 0.020 | ND |
| Arsenic | 0.005 | ND | 0.005 | ND | ND | ND | 0.010 | ND | ND |
| Cadmium | 0.003 | 0.002 | 0.001 | ND | 0.003 | 0.002 | 0.002 | ND | ND |
| Chromium | 0.010 | 0.008 | 0.005 | ND | 0.009 | 0.006 | 0.006 | 0.004 | ND |
| Copper | 0.002 | 0.007 | 0.001 | ND | 0.002 | 0.020 | 0.001 | 0.004 | ND |
| Nickel | 0.010 | 0.007 | 0.005 | ND | 0.011 | 0.006 | 0.006 | 0.003 | ND |
| Zinc | 0.026 | 0.016 | 0.017 | ND | 0.050 | 0.011 | 0.011 | 0.047 | 0.026 |
| Cyanide | 0.180 | 0.058 | 0.130 | 0.107 | 0.930 | 0.130 | 0.040 | 0.033 | 0.031 |

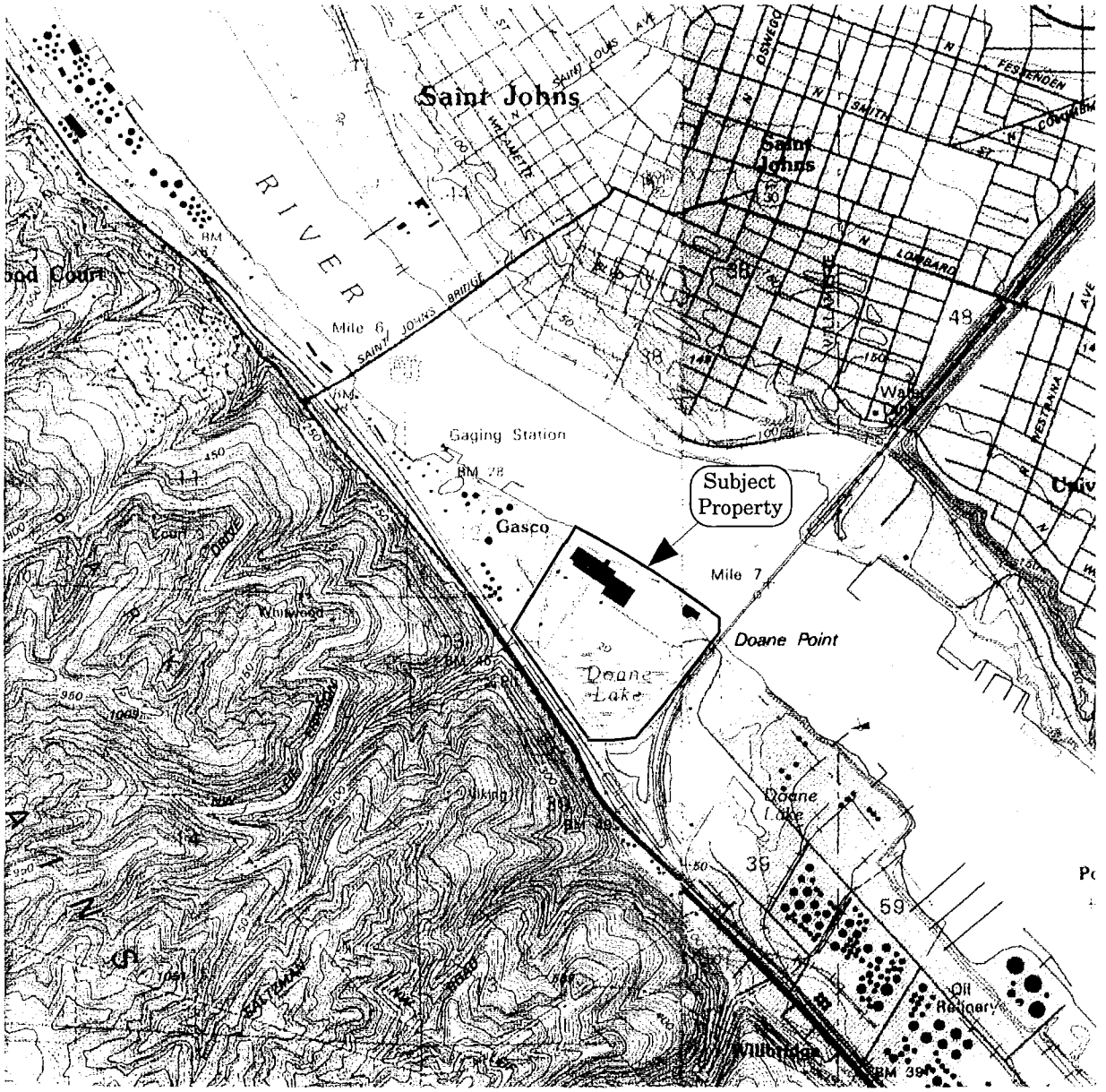
Note:
LPAHS = low molecular weight PAHs
HPAHS = high molecular weight PAHs
mg/l = miligrams per liter
ND = not detected at a concentration above method detection limits



SCOEPA00010772

# FIGURES

SCOEPA00010773




0 2,000 4,000

Note: Base Map from Linnton (1990) and Portland (1990), Oregon, USGS 7.5 Minute Quadrangles

| | | | |
|---|---|---|---|
| Project No. 5237<br>October 2000 | **HAHN AND ASSOCIATES**<br>**INCORPORATED**<br>ENVIRONMENTAL MANAGEMENT<br>434 NW SIXTH AVENUE, SUITE 203<br>PORTLAND, OREGON 97209<br>(503) 796-0717 | **LOCATION MAP**<br>Wacker Siltronic Corporation<br>7200 NW Front Avenue<br>Portland, Oregon | **FIGURE**<br>**1** |

SCOEPA00010774

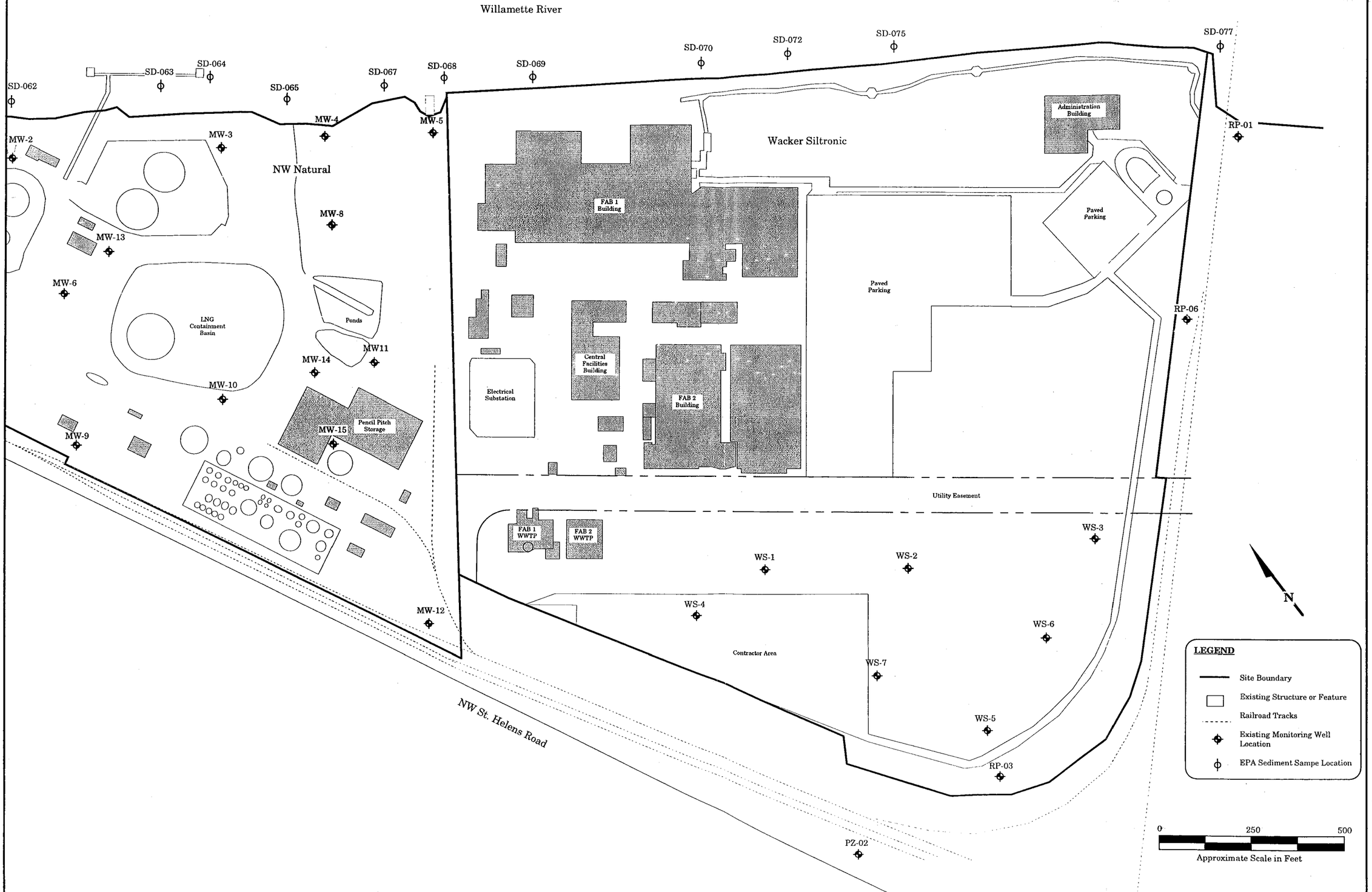



**Figure 2**

**Site Map**

Remedial Investigation Scoping Document
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon


**HAHN & ASSOCIATES, INC.**
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717


**November 2000**

**Project No. 5237**

SCOEPA00010775

*Surface Sediment Concentrations*

| Station | ug/kg naphthalene | Tot LPAH | Tot HPAH |
|---|---|---|---|
| SD062 | 1900 | 211460 | 524200 |
| SD063 | 1200 | 26970 | 57600 |
| SD064 | 130000 | 402400 | 420200 |
| SD065 | 20000 | 165800 | 268800 |
| SD067 | 13000 | 112400 | 192000 |
| SD068 | 790 | 60430 | 89800 |
| SD069 | 200 | 65680 | 58390 |
| SD070 | 510 | 73571 | 46990 |
| SD072 | 210 | 4995 | 8630 |
| SD075 | 350 | 13490 | 15260 |
| SD077 | 300 | 6860 | 9060 |
| SD078 | 55 | 425 | 3034 |
| SD080 | 31 | 337 | 2134 |
| SD081 | 20 | 45 | 638 |
| SD083 | 25 | 300 | 2230 |
| SD084 | 20 | 71 | 707 |
| SD085 | 22 | 220 | 1273 |
| SD087 | 20 | 241 | 1656 |
| SD072 (subsurface 0-90cm) | 200 | 31500 | 18860 |
| SD081C (subsurface 0-90 cm) | 240 | 2160 | 7252 |

Figure compiled by Anchor Environmental, LLC

500 0 500 1000 Feet

SOURCE:

1. AERIAL PHOTOGRAPHY - OREGON METRO DATA RESOURCE CENTER, SEPTEMBER 1997
2. TAX LOT DATA - OREGON METRO DATA RESOURCE CENTER, CURRENT AS OF MAY 2000
3. SAMPLE LOCATIONS - WESTON, 1998

| | | | |
|---|---|---|---|
| Project No. 5237 | **HAHN AND ASSOCIATES** INCORPORATED | **EPA SEDIMENT SAMPLE LOCATION MAP** | **FIGURE** |
| November 2000 | ENVIRONMENTAL MANAGEMENT 434 NW SIXTH AVENUE, SUITE 203 PORTLAND, OREGON 97209 (503) 796-0717 | Wacker Siltronic Corp. 7200 NW Front Avenue Portland, Oregon | 3 |

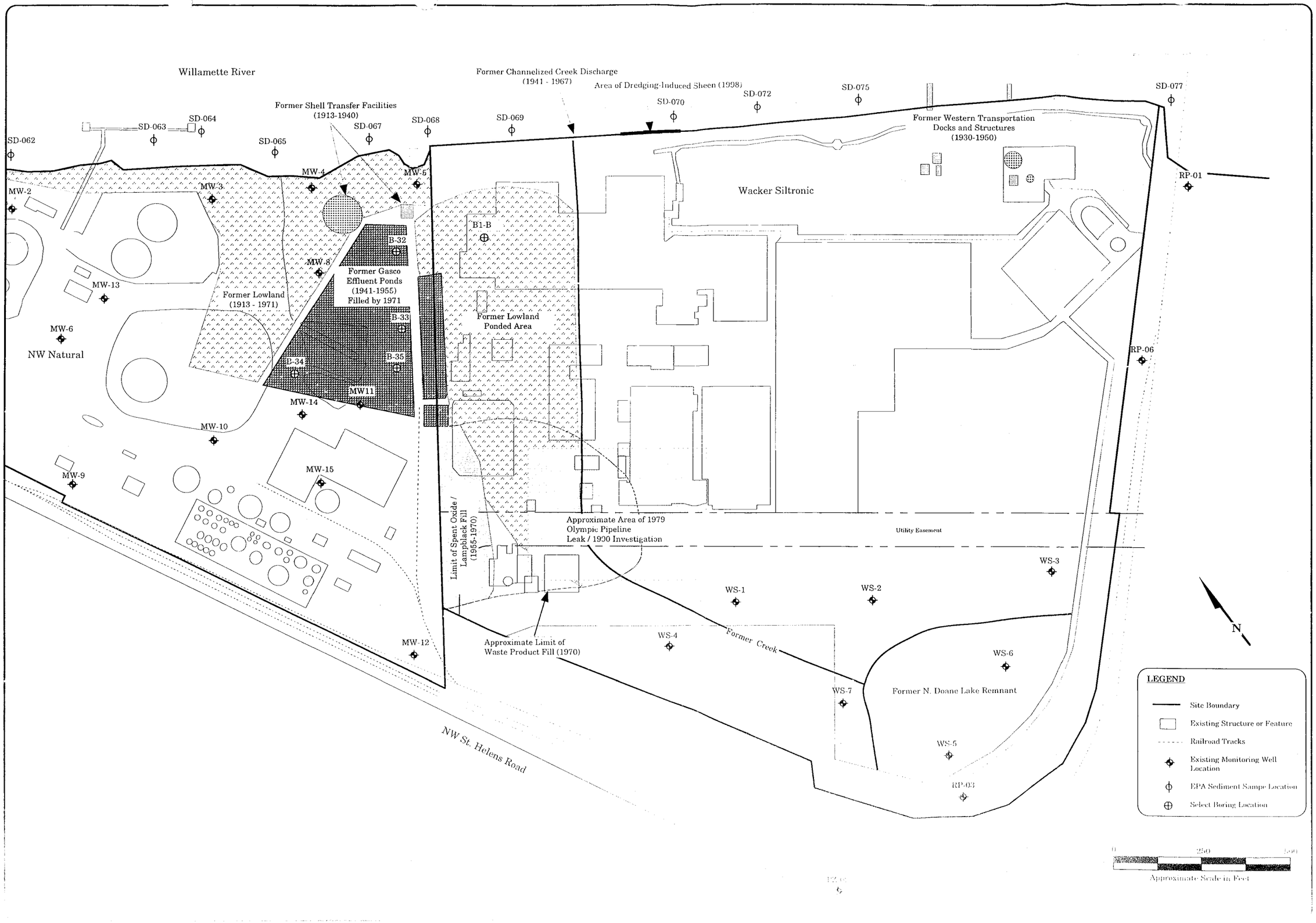



**Figure 4**

**Historical Features Map**

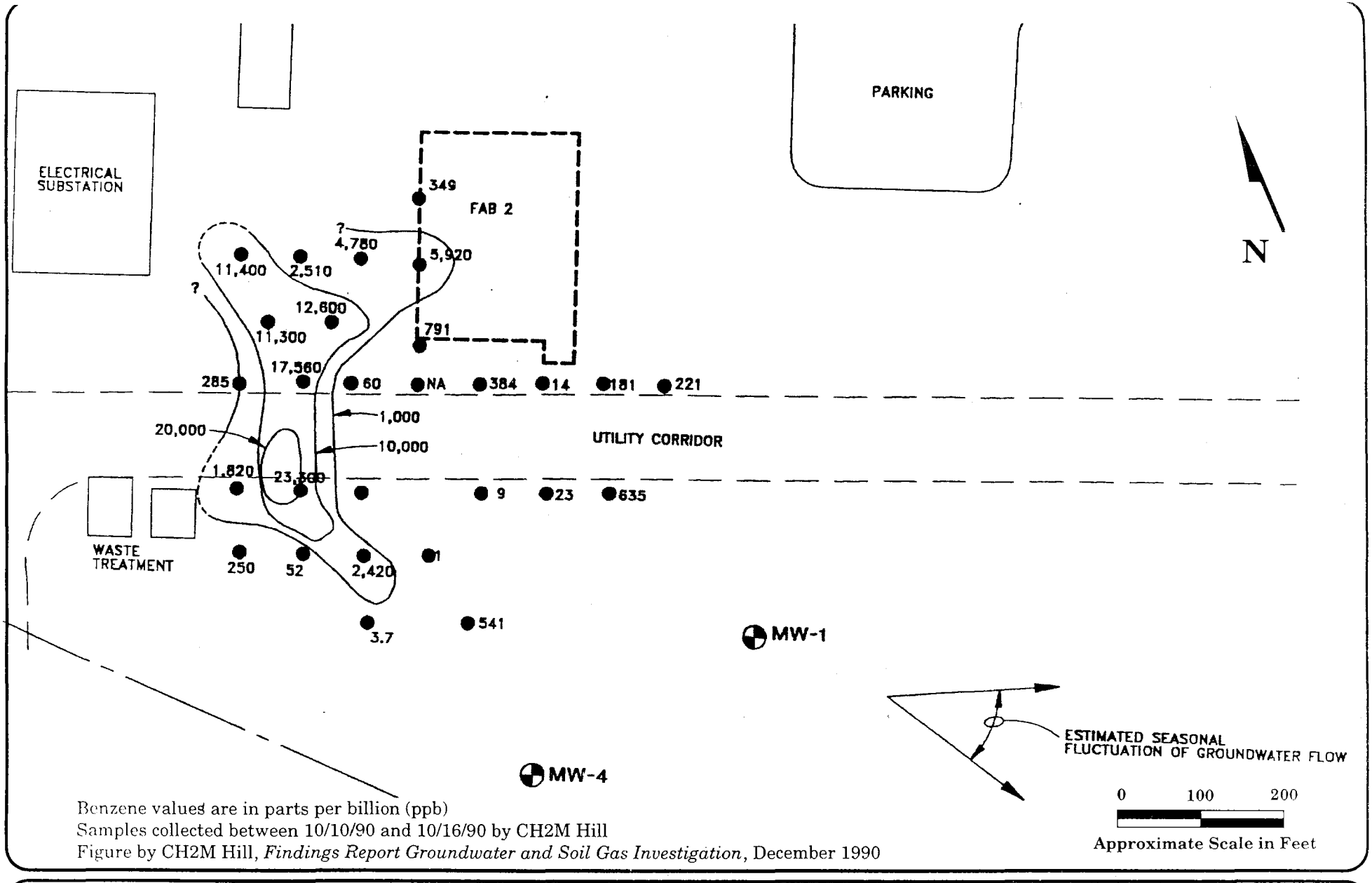
Remedial Investigation Scoping Document
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon


**HAHN & ASSOCIATES, INC.**
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717


November
2000

Project No.
5057

SCOEPA00010777




Benzene values are in parts per billion (ppb)
Samples collected between 10/10/90 and 10/16/90 by CH2M Hill
Figure by CH2M Hill, *Findings Report Groundwater and Soil Gas Investigation*, December 1990

| | | | |
|---|---|---|---|
| Project No. 5237 | **HAHN AND ASSOCIATES** INCORPORATED | **Benzene Concentrations in Groundwater** | FIGURE |
| November 2000 | ENVIRONMENTAL MANAGEMENT<br>434 NW SIXTH AVENUE, SUITE 203<br>PORTLAND, OREGON 97209<br>(503) 796-0717 | Remedial Investigation<br>Wacker Siltronic Corporation<br>7200 NW Front Avenue<br>Portland, Oregon | 5 |

SCOEPA00010778

Figure
6

Conceptual Push Probe and Well Locations

Remedial Investigation Scoping Document
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Willamette River

Former Channelized Creek Discharge
(1941 - 1967)

Area of Dredging-Induced Sheen (1998)

Former Western Transportation
Docks and Structures
(1930-1950)

Former Shell Transfer Facilities
(1913-1940)

SD-062
SD-063
SD-064
SD-065
SD-067
SD-068
SD-069
SD-070
SD-072
SD-075
SD-077

MW-2
MW-3
MW-4
MW-5
MW-6
MW-8
MW-9
MW-10
MW-11
MW-12
MW-13
MW-14
MW-15

P-1
P-2
P-3
P-4
P-5
P-6
P-7
P-8
P-9

WS-8
WS-9
WS-10
WS-11
WS-12

B1-B
B-32
B-33
B-34
B-35

RP-01
RP-06
RP-03

NW Natural

Former Lowland
(1913 - 1971)

Former Gasco
Effluent Ponds
(1941-1955)
Filled by 1971

Former Lowland
Ponded Area

Wacker Siltronic

Limit of Spent Oxide /
Lampblack Fill
(1955-1970)

Approximate Area of 1979
Olympic Pipeline
Leak / 1990 Investigation

Utility Easement

Approximate Limit of
Waste Product Fill (1970)

WS-1
WS-2
WS-3
WS-4
WS-5
WS-6
WS-7

Former Creek

Former N. Doane Lake Remnant

NW St. Helens Road

N

LEGEND

- Site Boundary
- Historical Structure or Feature
- Railroad Tracks
- Existing Monitoring Well Location
- Proposed Push Probe Boring Location, Soil Only
- Proposed Push Probe Boring Location, Soil and Groundwater
- Potential Well Cluster Location

0 250 500
Approximate Scale in Feet


HAHN & ASSOCIATES, INC.
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717


November
2000

Project No

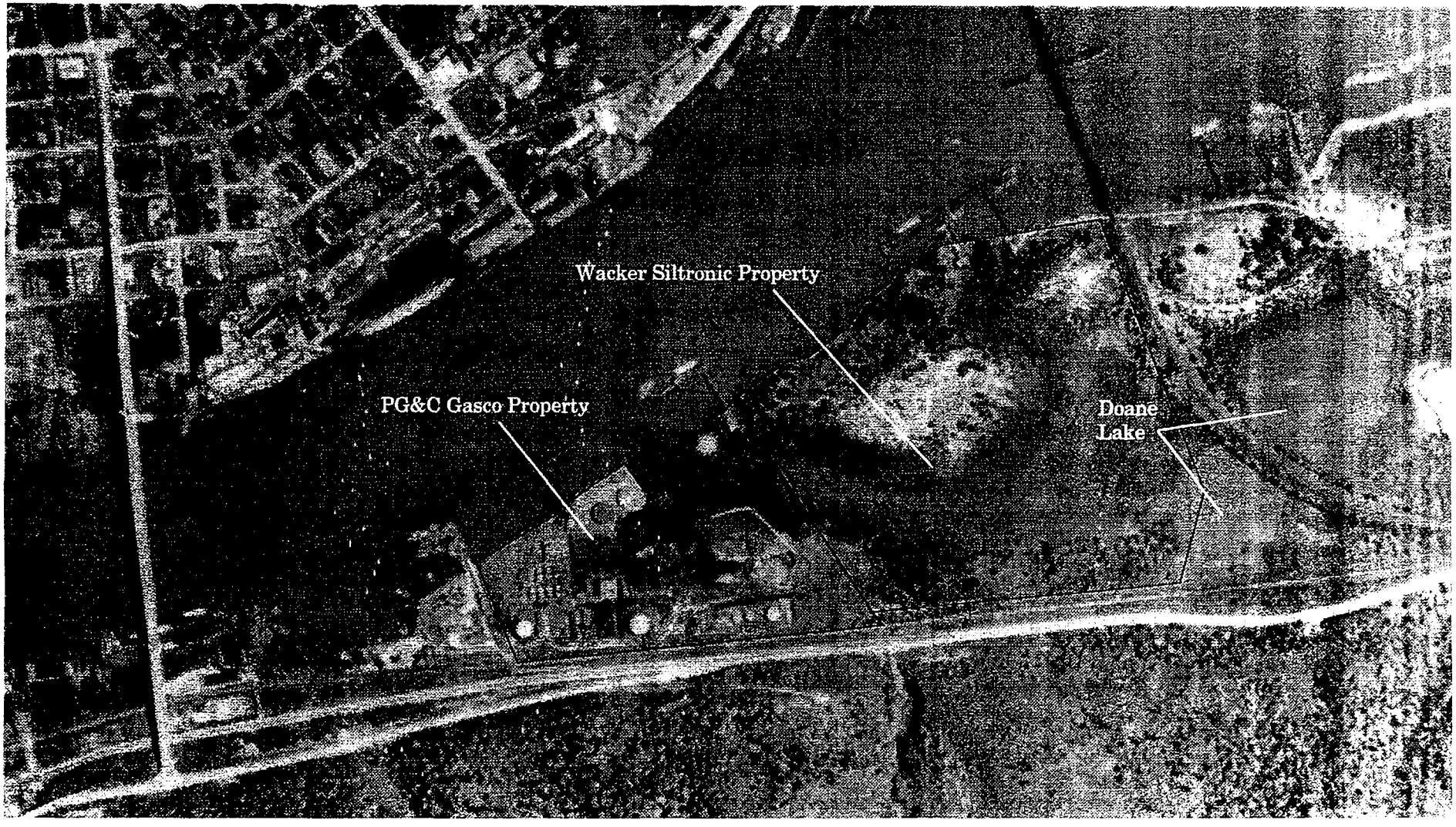
SCOEPA00010779

# APPENDICES

**APPENDIX A**

Historical Aerial Photographs

SCOEPA00010782

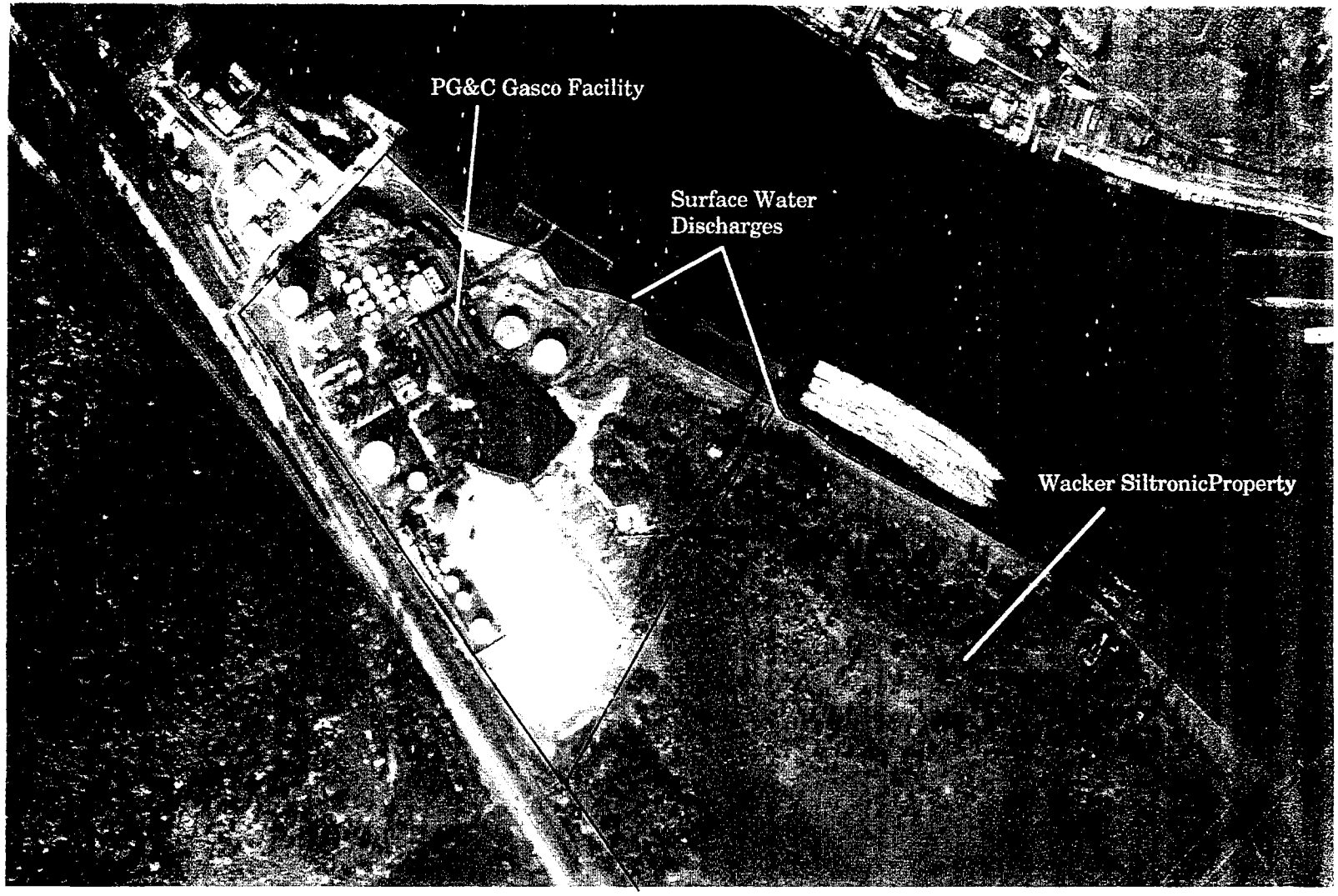



N

Base Photograph From: *Site History, Wacker Siltronic Corporation, Portland, Oregon*; (PDC, 1985)
Ackroyd Photography: May 1936

| | | | |
|---|---|---|---|
| Project No. 5237 | **HAHN AND ASSOCIATES** INCORPORATED | **Aerial Photograph: 1936** | FIGURE |
| November 2000 | ENVIRONMENTAL MANAGEMENT<br>434 NW SIXTH AVENUE, SUITE 203<br>PORTLAND, OREGON 97209<br>(503) 796-0717 | Wacker Siltronic Corporation<br>7200 NW Front Avenue<br>Portland, Oregon | A-1 |

SCOEPA00010783

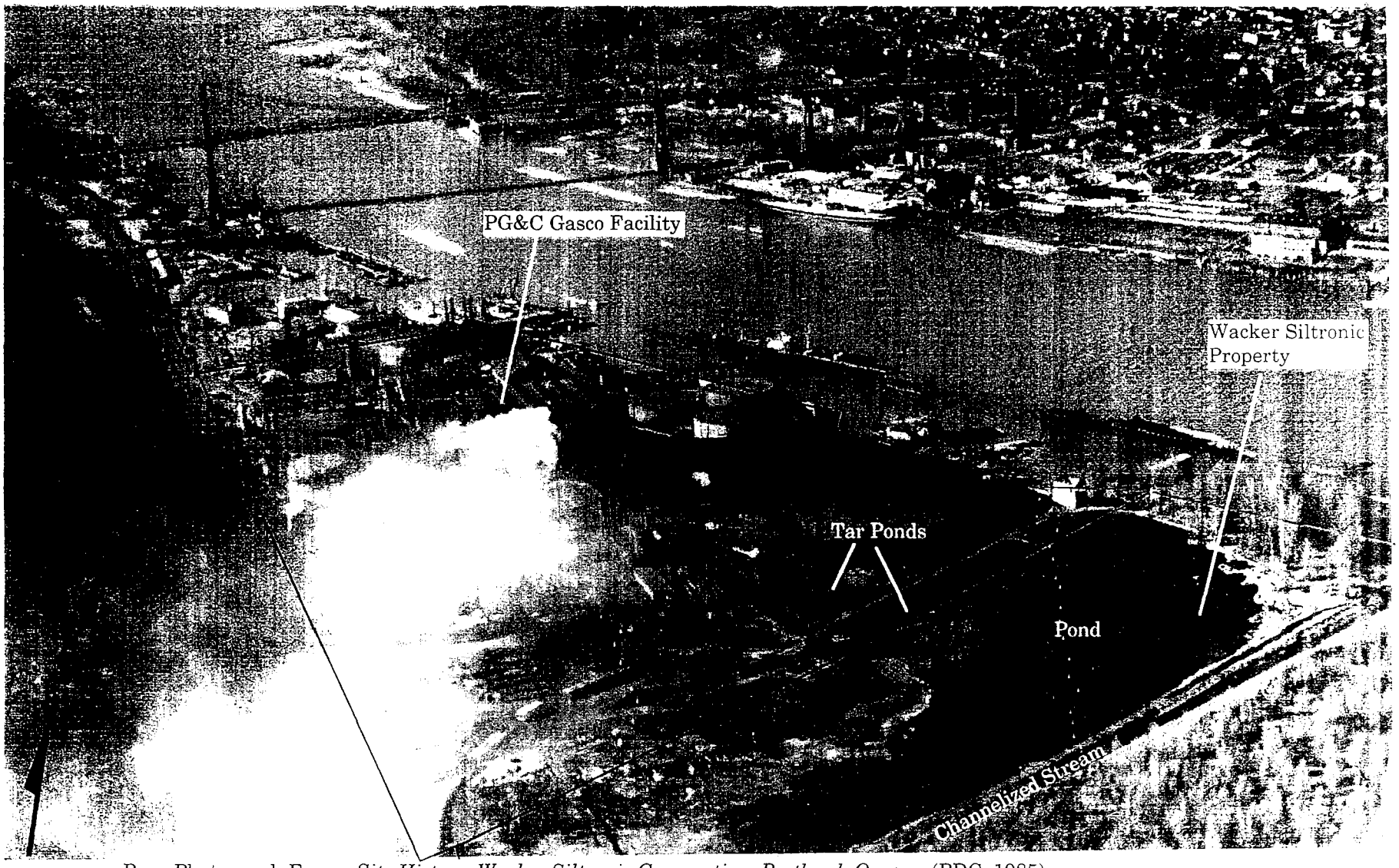



N

Base Photograph From: *Site History, Wacker Siltronic Corporation, Portland, Oregon*; (PDC, 1985)
Ackroyd Photography: October 1940

| | | | |
|---|---|---|---|
| Project No. 5237 | **HAHN AND ASSOCIATES** INCORPORATED | **Aerial Photograph: 1940** | FIGURE |
| November 2000 | ENVIRONMENTAL MANAGEMENT<br>434 NW SIXTH AVENUE, SUITE 203<br>PORTLAND, OREGON 97209<br>(503) 796-0717 | Wacker Siltronic Corporation<br>7200 NW Front Avenue<br>Portland, Oregon | A-2 |

SCOEPA00010784




N

Base Photograph From: *Site History, Wacker Siltronic Corporation, Portland, Oregon*; (PDC, 1985)
Ackroyd Photography: April 1952

8. APRIL 1952

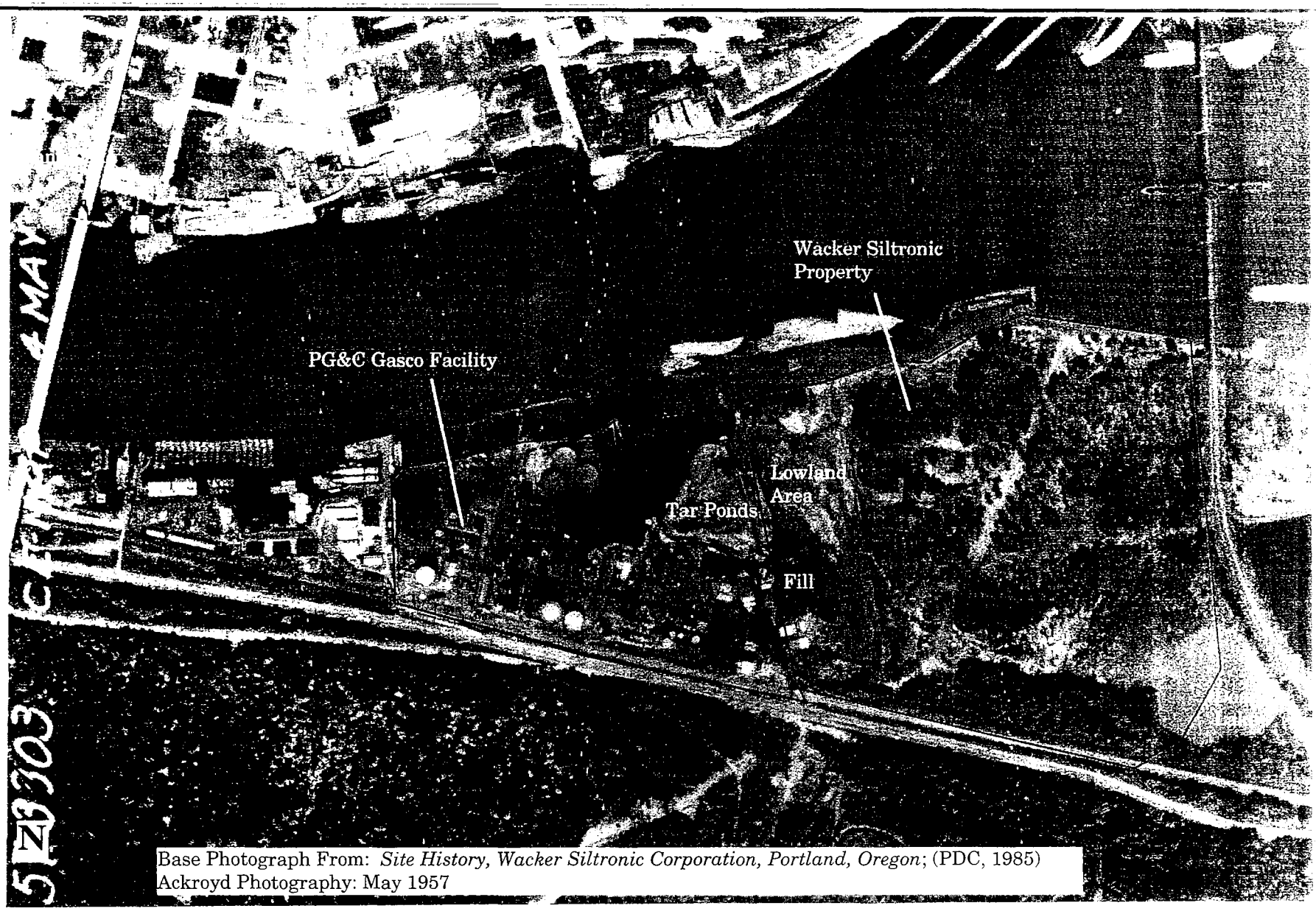
| | | | |
|---|---|---|---|
| Project No. 5237 | **HAHN AND ASSOCIATES** INCORPORATED | **Aerial Photograph: 1952** | FIGURE |
| November 2000 | ENVIRONMENTAL MANAGEMENT<br>434 NW SIXTH AVENUE, SUITE 203<br>PORTLAND, OREGON 97209<br>(503) 796-0717 | Wacker Siltronic Corporation<br>7200 NW Front Avenue<br>Portland, Oregon | A-3 |

SCOEPA00010785

Base Photograph From: *Site History, Wacker Siltronic Corporation, Portland, Oregon*; (PDC, 1985)
Ackroyd Photography: March 1955

| | | | |
|---|---|---|---|
| Project No. 5237<br>October 2000 | **HAHN AND ASSOCIATES**<br>**INCORPORATED**<br>ENVIRONMENTAL MANAGEMENT<br>434 NW SIXTH AVENUE, SUITE 203<br>PORTLAND, OREGON 97209<br>(503) 796-0717 | **Aerial Photograph: 1955**<br>Wacker Siltronic Corp.<br>7200 NW Front Avenue<br>Portland, Oregon | **FIGURE**<br>**A-4** |

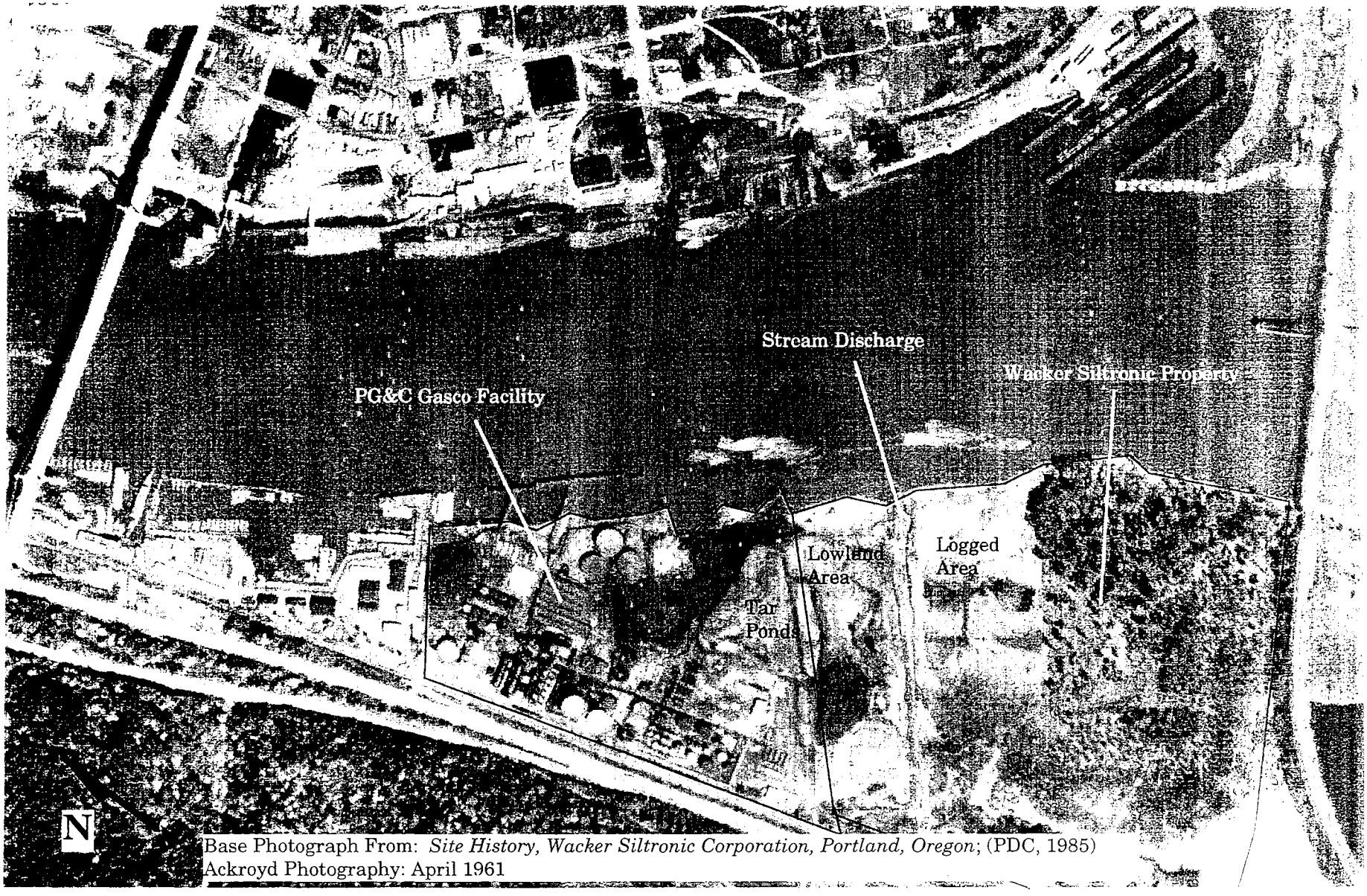
SCOEPA00010786




Base Photograph From: *Site History, Wacker Siltronic Corporation, Portland, Oregon*; (PDC, 1985)
Ackroyd Photography: May 1957

| | | | |
|---|---|---|---|
| Project No. 5237 | **HAHN AND ASSOCIATES** INCORPORATED | **Aerial Photograph: 1957** | FIGURE |
| November 2000 | ENVIRONMENTAL MANAGEMENT<br>434 NW SIXTH AVENUE, SUITE 203<br>PORTLAND, OREGON 97209<br>(503) 796-0717 | Wacker Siltronic Corporation<br>7200 NW Front Avenue<br>Portland, Oregon | A-5 |

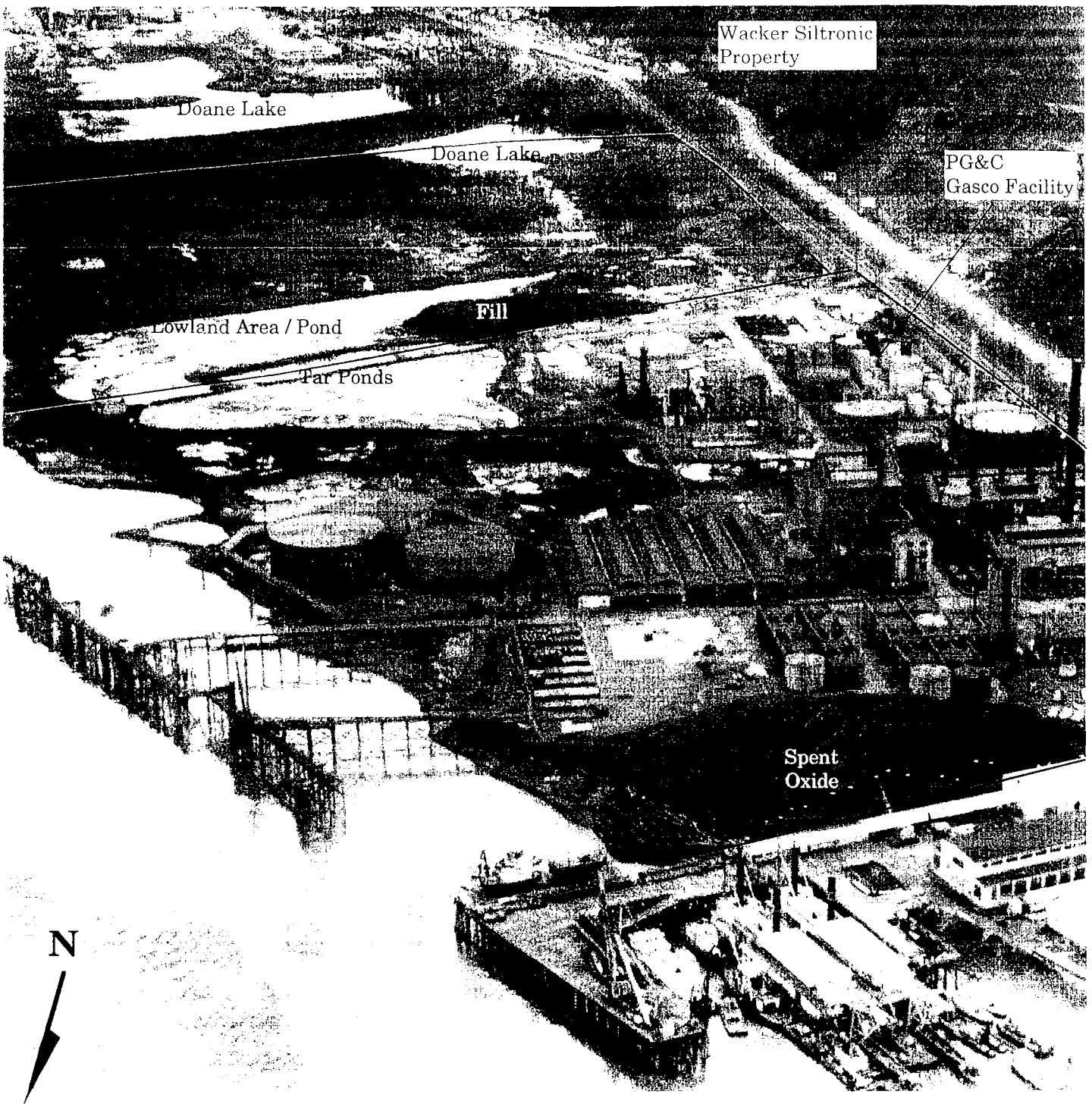
SCOEPA00010787




Base Photograph From: *Site History, Wacker Siltronic Corporation, Portland, Oregon*; (PDC, 1985)
Ackroyd Photography: April 1961

| | | | |
|---|---|---|---|
| Project No. 5237 | **HAHN AND ASSOCIATES INCORPORATED** | **Aerial Photograph: April 1961** | FIGURE A-6 |
| November 2000 | ENVIRONMENTAL MANAGEMENT<br>434 NW SIXTH AVENUE, SUITE 203<br>PORTLAND, OREGON 97209<br>(503) 796-0717 | Wacker Siltronic Corporation<br>7200 NW Front Avenue<br>Portland, Oregon | |

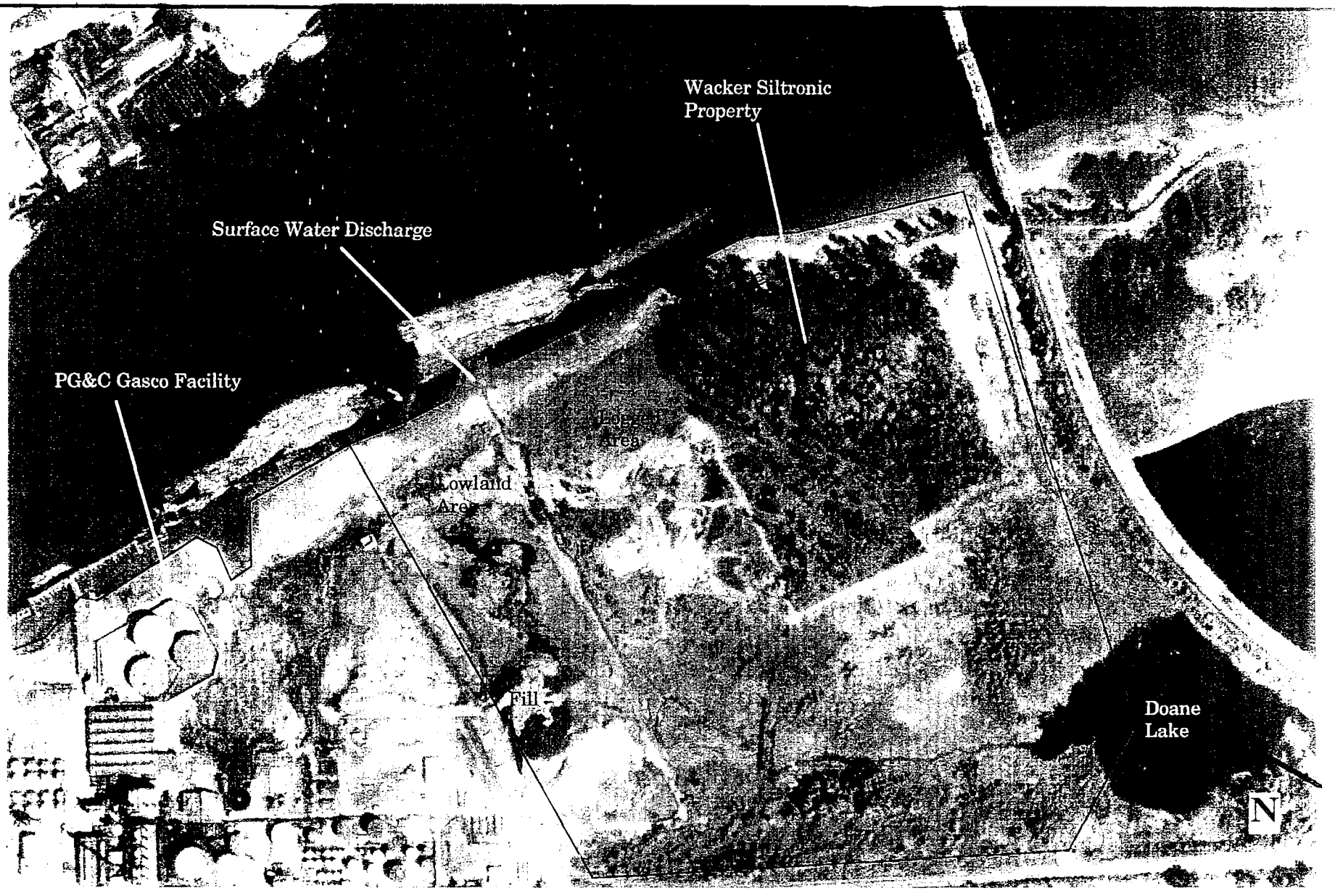
SCOEPA00010788




Base Photograph From: *Site History, Wacker Siltronic Corporation, Portland, Oregon*; (PDC, 1985)
Ackroyd Photography: March 1961

| | | | |
|---|---|---|---|
| Project No. 5237 | **HAHN AND ASSOCIATES** INCORPORATED | **Aerial Photograph: March 1961** | **FIGURE** |
| October 2000 | ENVIRONMENTAL MANAGEMENT<br>434 NW SIXTH AVENUE, SUITE 203<br>PORTLAND, OREGON 97209<br>(503) 796-0717 | Wacker Siltronic Corp.<br>7200 NW Front Avenue<br>Portland, Oregon | A-7 |

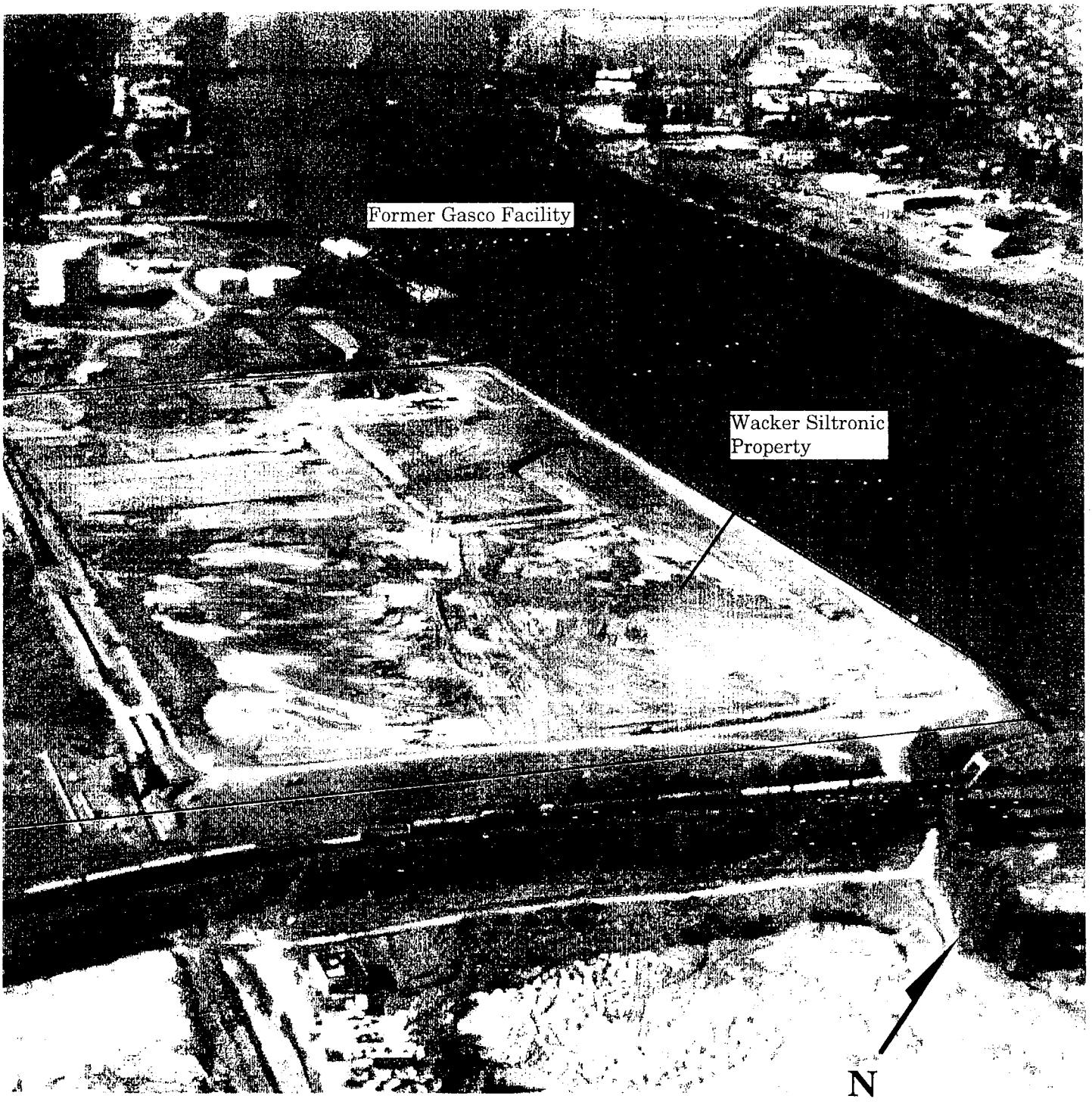
SCOEPA00010789




| | | | |
|---|---|---|---|
| Project No. 5237 | **HAHN AND ASSOCIATES** INCORPORATED | **Aerial Photograph: 1964** | FIGURE |
| November 2000 | ENVIRONMENTAL MANAGEMENT<br>434 NW SIXTH AVENUE, SUITE 203<br>PORTLAND, OREGON 97209<br>(503) 796-0717 | Wacker Siltronic Corporation<br>7200 NW Front Avenue<br>Portland, Oregon | A-8 |

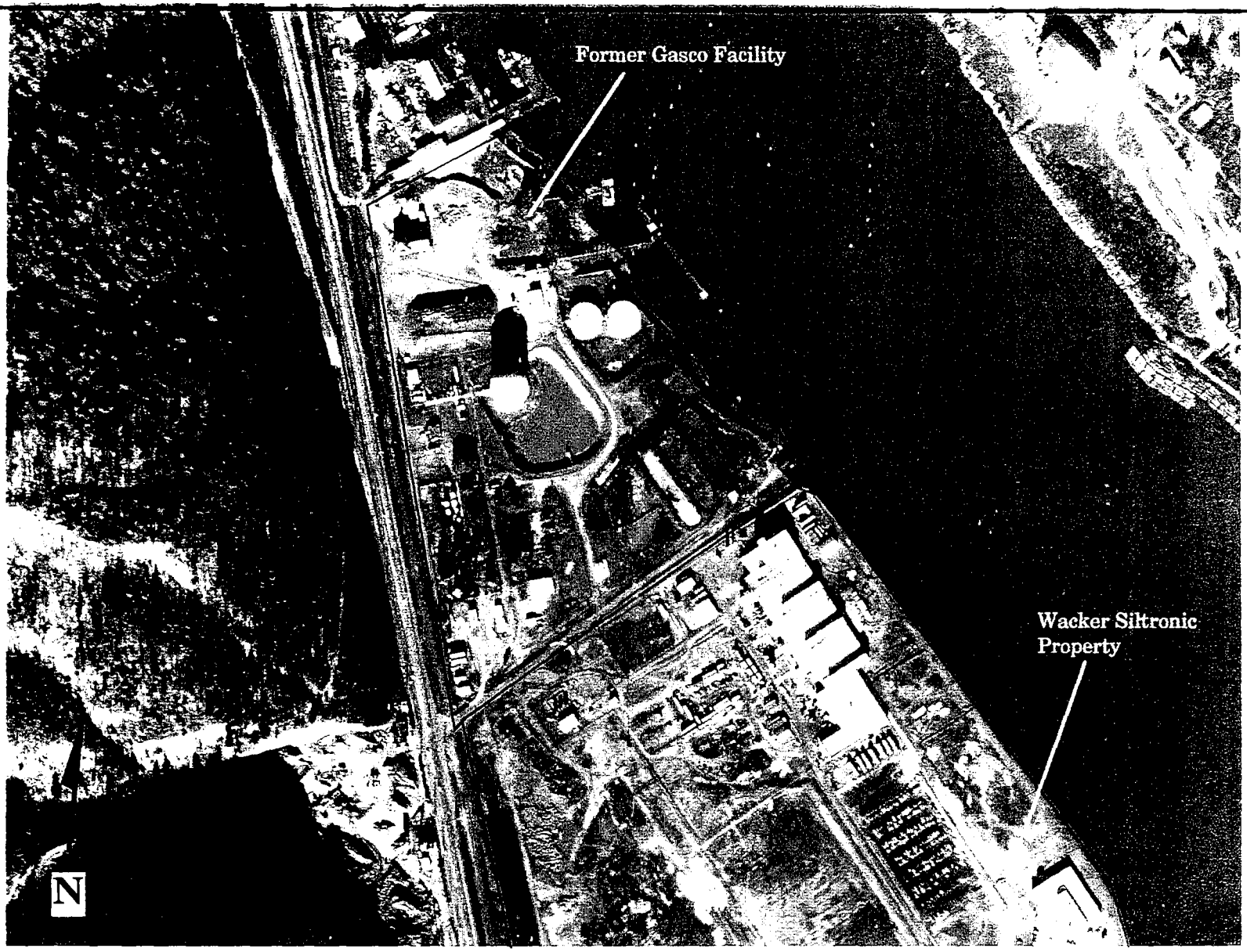
SCOEPA00010790

| | | | |
|---|---|---|---|
| Project No. 5237 | **HAHN AND ASSOCIATES** INCORPORATED | **Aerial Photograph: October 1970** | **FIGURE** |
| October 2000 | ENVIRONMENTAL MANAGEMENT<br>434 NW SIXTH AVENUE, SUITE 203<br>PORTLAND, OREGON 97209<br>(503) 796-0717 | Wacker Siltronic Corp.<br>7200 NW Front Avenue<br>Portland, Oregon | A-9 |




Base Photograph From: *Site History, Wacker Siltronic Corporation, Portland, Oregon*; (PDC, 1985)
Ackroyd Photography: October 1978

| | | | |
|---|---|---|---|
| Project No. 5237 | **HAHN AND ASSOCIATES** INCORPORATED | **Aerial Photograph: October 1978** | **FIGURE** |
| October 2000 | ENVIRONMENTAL MANAGEMENT<br>434 NW SIXTH AVENUE, SUITE 203<br>PORTLAND, OREGON 97209<br>(503) 796-0717 | Wacker Siltronic Corp.<br>7200 NW Front Avenue<br>Portland, Oregon | A-10 |




| | | | |
|---|---|---|---|
| Project No. 5237 | **HAHN AND ASSOCIATES** INCORPORATED | **Aerial Photograph: 1980** | FIGURE A-11 |
| November 2000 | ENVIRONMENTAL MANAGEMENT<br>434 NW SIXTH AVENUE, SUITE 203<br>PORTLAND, OREGON 97209<br>(503) 796-0717 | Remedial Investigation<br>Wacker Siltronic Corporation<br>7200 NW Front Avenue<br>Portland, Oregon | |

SCOEPA00010793

DEQ SITE ASSESSMENT PROGRAM - STRATEGY RECOMMENDATION

Site Name: Wacker Siltronic Corporation

Site CERCLIS Number: ORD096253737

DEQ ECSI Number: 183

Site Address: 7200 NW Front Avenue
Portland, OR 97210
(T1N/R1W-S13)

Recommendation By: Eric Blischke, Waste Management and Cleanup Division

Approved By: Mike Rosen, Portland Harbor Manager, DEQ Northwest Region (ED) FOR MER

Date: October 8, 1999

The Wacker Siltronic site has been the subject of a previous EPA Preliminary Assessment (October 1989), a DEQ Preliminary Assessment Equivalent (August 1991) and subsequent Site Priority Evaluation / Strategy Recommendation (May 1993), as well as DEQ subsurface soil and groundwater evaluations associated with the Doane Lake Study Area hydrogeological evaluation ( ECSI #36; 1989-91). The purpose of this document is to summarize new site information that has become available since DEQ's May 1993 Site Priority Evaluation.

NOTE: This site (See Figures 1 and 2) is within a 6-mile stretch of the Lower Willamette River in which the U.S. Environmental Protection Agency (EPA) conducted a sediment study in 1997. This area, referred to as the *Portland Harbor*, is between the upstream ends of Sauvie Island (River Mile 3.5) and Swan Island (RM 9.5). The primary purpose of this Strategy Recommendation is to determine whether a specific hazardous substance release or a specific past operation at the site can be linked to contamination documented by EPA in sediments adjacent to the site. Because of this focus, the Strategy Recommendation may omit some historical site information, regulatory issues, or further-action conclusions that might otherwise be included in a DEQ Strategy Recommendation.

## Background, Portland Harbor Sediment Evaluation

In September and October 1997, EPA's contractor, Roy F. Weston, Inc., collected 187 near-shore sediment samples within the Portland Harbor area defined above. Most samples (150) were collected as shallow grab samples within the upper 6 to 17 centimeters (cm) of sediments. 37 deeper composite core samples, from depths of between 55 and 139 cm, were also collected. All samples were analyzed for total metals, semi-volatile organic compounds (SVOCs), total organic carbon (TOC),



SCOEPA00010794

and sediment grain size. Selected samples were also variously analyzed for organotins (TBTs), pesticides, polychlorinated biphenyls (PCBs), chlorinated herbicides, and polychlorinated dioxins and dibenzofurans.

Based on analytical results from this study, which showed extensive sediment contamination, EPA is currently considering Portland Harbor for inclusion on the federal National Priority List (NPL - also known as Superfund).

Between late 1998 and mid-1999, DEQ examined EPA's analytical data to determine potential sources for sediment contamination in the Harbor. Potential sources associated with the most contaminated areas of sediment were sites already active in DEQ's Cleanup Programs.

DEQ categorized other areas of sediment contamination (i.e., those areas not thought to be associated with active Cleanup Program sites) by defining the areas:

- having the highest detected concentration of a given contaminant;
- with contaminant concentrations in the upper five percent of a given contaminant's detected concentrations; and
- having contaminant concentrations above an apparent "baseline range" most commonly detected throughout the harbor area.

DEQ categorized in this manner because there are no established freshwater sediment contaminant concentration guidelines or well-defined background contaminant concentrations for the harbor area. The contaminant "baseline range" was developed by examining the geometric distribution of concentrations for each contaminant detected. Any sediment concentrations that appeared to depart significantly from the ranges most commonly detected were suspected of lying near a potential contaminant source.

Six shallow and one deep sediment sample were collected adjacent to the Wacker Siltronics site as shown in Table 1 and on Figure 3. Sediment samples were found to contain concentrations of low- and high-molecular weight polycyclic aromatic hydrocarbons (LPAHs and HPAHs respectively) up to 100 times baseline concentrations established for Portland Harbor. In addition, PAH related compounds 2-methylnaphthalene, carbozole and dibenzofuran were also detected at concentrations more than 10 times baseline concentrations. Other organic contaminants detected above baseline include 2,4-D, 2,4-DB, pentachlorophenol and bis(2-ethylhexyl) phthalate.

Inorganic chemicals which exceed baseline include beryllium, cobalt, iron, manganese, selenium, silver, titanium, vanadium and zinc. However, the majority of these detections exceeded baseline by less than 20%.



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Concentrations detected in the deep sediment sample (SD-072A) were generally higher than concentrations detected in the corresponding shallow sediment samples (SD-072). This indicates the contamination may be the result of historical releases of hazardous substances.

Operational History

Wacker Siltronic Corporation (Wacker) operates a silicon wafer fabricating plant on an 85 acre site along the southern bank of the Willamette River in Northwest Portland (see Figures 1 and 2). Silicon wafers are the substrate on which the electronics industry builds more than 90 percent of its integrated circuits (semiconductors).

The site is bounded on the northeast by the Willamette River, on the northwest by a liquefied natural gas (LNG) storage facility owned by Northwest Natural (NWN) (ECSI #84), and on the southeast and southwest by Burlington Northern / Santa Fe Railroad (BNSF) right-of-ways. Doane Creek passes between the Wacker and NWN properties. Koppers Industries, Inc., operates a creosote and tar pitch distribution terminal on property leased from NWN at the western corner of the Wacker site. US Highway 30 (NW St. Helens Road), a former rock quarry, and the Tualatin Mountains lie beyond the BNSF right-of-way to the southwest. Beyond the southeastern BNSF right-of-way lie the Rhone-Poulenc (ECSI #155), ESCO Corp. (ECSI #397), Gould / NL Industries (ECSI #49), and Elf Atochem North America (ECSI #398) environmental cleanup sites[1].

The Wacker property was originally owned by NWN who operated an oil gasification facility (the former GASCO facility) on the property. The Wacker parcel was sold by NWN in 1962 to V. Rosenfeld and H. Anderson. In 1978, this parcel was purchased by the Portland Development Commission (PDC) who in turn sold it to Wacker in August of the same year. Wacker began construction of their silicon wafer manufacturing plant in October, 1978. The plant was completed in December 1979 and operation began in March 1980.

Based on a review of aerial photographs and other historical information, it appears that wastewater settling ponds constructed as part of the former GASCO facility extended onto the northern portion of the Wacker property. These settling ponds were periodically excavated and the dredged tars disposed of in low lying areas on the Wacker property. However, the exact location and nature of these disposal areas is unknown.

Western Transportation operated a fueling dock at the northeast corner of the Wacker Facility which had two large above ground fuel

[1] Both the GASCO and Gould / NL Industries sites are currently listed on CERCLIS. The GASCO, Elf Atochem and Rhone-Poulenc sites are currently undergoing Remedial Investigations; the Gould / NL Industries site is currently in the Remedial Action phase of cleanup. The Gould site has been listed on EPA's National Priority List (NPL).



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tanks. EPA analysis of a 1970 air photo concluded that soils in this area were stained.

A pipeline that appears to have led from the southeast corner of the former GASCO operation (location of a tank farm that stored BTEX, naphthalene, tar and naphtha) to the Western Transportation facility was decommissioned when Wacker bought the site. Decommissioning consisted of capping the pipeline at both ends. A PDC diagram of the pipeline suggests that the pipeline terminated on the southwestern edge of the Wacker site. Apparent soil disturbances observed in a 1957 aerial photo suggest that the pipeline was constructed around the southwestern end of GASCO's wastewater lagoon and continued toward the GASCO tank farm.

The nature of any potential releases from the pipeline is unclear. Petroleum sheens have been released in the river in the Western Transportation boat dock area on two occasions during river dredging operations.

A utility corridor running across the site (See Figure 4) holds two Olympic petroleum pipelines and a sanitary sewer line. There are also indications that a Pacific Northern pipeline passes through the corridor, but this may be a reference to the Olympic pipelines.

One or both of the Olympic pipelines appear to have leaked on at least two occasions. On the first occasion, holes in one of the lines was repaired, but there is no record or documentation of the soil cleanup. On the second occasion, two sets of pipeline pressure tests (several months apart) appear to have indicated a pipeline leak. Bypasses were installed on both pipelines and old pipeline sections appear to have been capped in place. There is no documentation of whether a soil cleanup was performed.

Subsurface petroleum/tar was also encountered during construction of the Wacker wastewater treatment plant (shallow, free-flowing product), prior to the construction of Wacker's FAB 2 facility, and during soil borings and monitoring well construction at the southeastern end of the site.

A historic Chapmen Chemical release of herbicides killed extensive vegetation on the Wacker site in the 1960's. Contamination likely flowed from Doane Lake to North Doane Lake to a stream that flowed to Doane Creek and finally to the Willamette River.

## Regulatory History

**DEQ Cleanup Programs:**

Over the past twenty years, a number of incidents involving the release of hazardous substances have occurred at the Wacker site. A summary is presented below.



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February/March 1979: In February 1979, DEQ personnel were called to the Wacker Siltronic facility during its construction to determine the origin of a petroleum release found on the property. An initial sample collected on March 1, 1979 from an undefined clarifier was found to contain 40 hydrocarbon components in the $C_{10}$ to $C_{22}$ range with a peak maximum at $C_{15}$. A sample of diesel fuel obtained from the Olympic Pipeline Company was also analyzed and found to match the sample collected from the clarifier. Another sample collected from an exploratory pit above the pipeline on March 12, 1979 was found to contain hydrocarbons in the $C_8$ to $C_{19}$ range with a peak maximum at $C_{12}$. The DEQ laboratory concluded that this sample did not match the sample obtained from the Olympic Pipeline Company (Olympic). Although the above results were inconclusive, Olympic apparently determined that the pipeline had leaked and made the appropriate repairs.

December 1980: On December 16, 1980, a green color was noted in the wastewater treatment plant's concentrated acid system. A total of 5.5 pounds of chromium was taken to the Arlington hazardous waste landfill for disposal. It was estimated that approximately 1.3 pounds. of chromium discharged to river the following day.

December 1984: Spills at the Wacker facility's trichloroethene (TCE) stripper unit were reported on December 3, 1984 (360 gallons) and again on December 31, 1984 (900 gallons). Contaminated soils were excavated and sent to Arlington for disposal. A concrete containment dike and monitoring well were subsequently installed.

June 1987: On June 25, 1987, a wastewater line containing very weak detergents plugged and water overflowed onto a gravel yard and the main roadway, stormwater catch basin, then to a river outfall.

October 1990: On October 17, 1990 Wacker notified the Olympic Pipeline and National Response Center of a possible leak associated with the Olympic pipeline (EMD # 90-1462). Following the completion of a soil gas and groundwater investigation and pipeline pressure test, approximately 2000 feet of the pipeline was replaced. A summary of the investigation is presented in the Investigative History section of this strategy recommendation.

September 1991: On September 11, 1991 (OERS #91-062) a leak from a weak acid storage tank was reported. The cause of the leak was a sheared valve. Approximately 4,000 gallons of the weak acid was released to the ground; approximately 1000 gallons was subsequently recovered.



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April 1997: A release of caustic rinse water from a ion-exchange regeneration unit due to a severed wastewater pipeline was reported on 4/28/1997.

July 1998: An oil sheen was observed in the river along the Wacker site on July 29, 1998 (OERS #98-1792). The sheen was approximately 20-50 yards long and originated from subsurface sediments. The release occurred during riverbank repair conducted by Advanced American Diving. Silt was being dredged from sediments to be used as backfill in riprap. The contaminated sediments were placed on the bank before being transferred to 8 lined 20-yard drop boxes. Further offshore dredging discontinued and another backfill source was obtained off-site. A reported 75.72 tons of contaminated material was sent to Arlington for disposal. The primary contaminant detected was petroleum. Total petroleum hydrocarbon analysis was performed on eight samples and the following concentration ranges were reported: gasoline: 7.49-69 ppm; diesel: 399-5810 ppm, heavy oil: 293-2970 ppm.

**Pollution Complaints:**

The following pollution complaints were received by DEQ:

- On April 2, 1981, the storage of empty chemical barrels stored in an area that drains to the Willamette River. Subsequent inspection by DEQ determined that this situation did not represent an environmental threat.

- On February 25, 1981, the Arlington hazardous waste landfill reported the disposal of 6000 gallons of chromic and nitric acids (about 20 ppm each) from a spill (tank overflow). Chromic acid had entered a floor drain and sump at the Wacker facility.

**Permits:**

Wacker Siltronics currently holds the following permits:

- Air Contaminant Discharge Permit (ACDP Permit No. 26-3002) issued by DEQ.
- National Pollutant Discharge Elimination System Waste Water Discharge Permit (NPDES Permit No. 101128) issued by DEQ.
- Storm Water Discharge Permit (NPDES No. 1200-Z) issued by DEQ.
- Municipal Pretreatment Program Waste Water Discharge Permit (No. 469-001) issued by the City of Portland.

On January 11, 1988, PCP was detected in one of Wacker's wastewater permit monitoring samples at 0.2 mg/l. The source of this detection is unknown; however, it should be noted that PCP was also detected in Koppers wastewater stream, which discharges near the same location.



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## Investigative History

In August, 1977, three soil test borings and penetrometer probes were installed on the Wacker parcel. The sampling was conducted by CH2M Hill and submitted in a September 1977 Geotechnical and Vibration Monitoring Investigation report to Wacker prior to their purchase of the property. Each boring log had multiple references to bitumen, a generic term applied to natural inflammable substances of variable color, hardness, and volatility composed principally of a mixture of hydrocarbons.

In April 1985, CH2M Hill conducted a soil investigation at the Wacker facility. Sample locations are presented in Figure 4. Wacker was concerned that contamination on their property would prevent or hinder the planned expansion of their facility. Seven soil borings were installed in the vicinity of a proposed polysilicon plant in western portion of the Wacker property. The borings were installed to depths ranging from 31.5 to 41.5 feet and were completed as monitoring wells. Soil samples were analyzed for oil and grease, phenols, volatile organic compounds (VOCs), polynuclear aromatic hydrocarbons (PAHs) and pesticides, herbicides and metals according to the extraction procedure - toxicity (EP-Tox) methodology.

Analysis of the soil boring samples detected the presence of chlorinated and aromatic volatiles, various phenolic compounds including pentachlorophenol and elevated concentrations of PAHs. EP-Tox analysis detected low concentrations of barium (below the regulatory threshold) and levels of 2,4-dichlorophenoxy acetic acid (2,4-D) above the regulatory threshold. Oil and grease levels ranged from 0.03% to 0.34%. Soil data are presented in Table 2.

Groundwater samples were collected from the newly installed monitoring wells in July and August 1985 as part of the investigation. Analysis detected the presence of aromatic VOCs (benzene, ethylbenzene and xylene); acetone and methylene chloride (which may represent laboratory contaminants); PAHs; cyanide and low levels of metals. United States Environmental Protection Agency (EPA) Drinking Water Maximum Contaminant Level (MCLs) were exceeded for many of the carcinogenic PAHs, benzene, lead and cyanide. Groundwater data are presented in Table 3.

In 1990, Geraghty and Miller conducted a Hydrogeological Investigation of the Doane Lake Area in northwest Portland. The primary purpose of the study was to evaluate the hydrogeologic conditions in the vicinity of the Gould Superfund site, calculate the zone of influence of potential Gould remedies and assess the impact that groundwater quality in the Doane Lake area could have on potential Gould site remedies.

As part of the investigation, two monitoring wells on the Wacker property were sampled. These included the existing MW-7 installed by CH2M Hill in 1985 and a newly installed intermediate depth well (MW-3I) installed adjacent to the existing MW-3. MW-3I was screened from



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55 to 60 feet while the existing MW-3 was screened from 12 to 27 feet. Low levels of phenol (0.003 mg/l) and PAHs (0.215 mg/l total PAHs) were detected in MW-3I while even lower levels of contamination (.016 mg/l total PAHs) were detected in MW-7 (See Table 3).

In July, 1990, two soil samples were collected from geotechnical borings installed as part of a proposed expansion by Wacker. The soil samples were found to be saturated with a black oily viscous substance. Elevated levels of BTEX, styrene, chlorobenzene and PAHs were detected. Total PAH concentrations detected in the two samples were 10,000 mg/kg and 6,100 mg/kg respectively.

In October 1990, CH2M Hill conducted a soil gas and groundwater investigation for Wacker to determine whether the Olympic pipeline was the source of subsurface hydrocarbon contamination previously detected on-site. This investigation was conducted in conjunction with Wacker's proposed expansion plans. Groundwater and soil gas samples were collected along a 600 foot length of the utility corridor adjacent to the proposed FAB 2 building site. However, the investigation concentrated on the collection of groundwater samples with the soil gas probes. Groundwater samples were collected just below the water table at a depth of approximately 25 feet. All samples were field analyzed for BTEX and TPH. A limited number of samples were sent to a laboratory for confirmatory analysis.

The results of the investigation detected elevated levels of BTEX and TPH in groundwater. Benzene concentrations ranged from non-detect to 23.3 mg/l. TPH concentrations ranged from 0.012 to 89.1 mg/l (see Table 4 for a summary of the analytical results). The highest concentrations of TPH and benzene were detected at a point south of and immediately adjacent to the pipeline utility corridor. Benzene and TPH concentrations correlated with one another. CH2M Hill concluded that the concentrations of benzene detected in groundwater samples are typical of those associated with a gasoline spill or leak. They further concluded that the location of the highest detected concentrations may indicate the source of the BTEX contamination. In addition to the BTEX contamination, the soil borings installed by CH2M Hill detected the presence of a black viscous substance thought to be associated with coal tar wastes. The visual observations of oil also correlated with the maximum BTEX and TPH concentrations. As a result, CH2M Hill was not able to ascertain the source of the BTEX contamination.

Based on the results of this investigation, Olympic pipeline excavated and pressure tested the pipeline to 250 psi. No obvious signs of contamination were observed and the pressure test was inconclusive. An additional pressure test was conducted by Marmac in February 1991. The test resulted in a failure of the pipeline. It is unclear whether the test caused the failure of the pipeline or whether a leak was present in the pipeline prior to the test. As a result of the leak, Olympic replaced approximately 2000 feet of the pipeline in March, 1991. In a June 1991 letter, Wacker contended that both lines were replaced.



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In 1995, petroleum contaminated soil was encountered during excavation activities associated with the construction of FAB 2 at the Wacker facility. 5490 tons of contaminated soil was thermally treated with a mobile soil remediation unit. Soils were treated under a solid waste letter of authorization issued by DEQ on April 17, 1995. Treated soils were disposed of at the St. Johns Landfill in Portland, Oregon. Due to the lack of adequate confirmation sampling results, it is unclear how much contaminated material was left in place at the conclusion of cleanup activities.

Since 1994, a remedial investigation has been underway at the adjacent GASCO site. A soil boring (B-33) installed adjacent to the Wacker/GASCO property line detected tar contamination to a depth of 67 feet below ground surface (bgs). In addition, groundwater collected from a monitoring well (MW-5-100) installed along the Willamette River adjacent to the GASCO/Wacker property line has been found to contain up to 11,400 ug/l of benzene and 7,400 ug/l of naphthalene.

Site Hydrogeology

The site lies in the northern-most Portland Basin, a major north-southeast trending sediment filled structural depression found in the northern part of the Willamette River valley and adjoining Columbia River valley (Swanson et al, 1993). The basin is filled with recent alluvium, Pleistocene cataclysmic flood deposits, Miocene to Holocene nonmarine sedimentary rocks, and is underlain by Eocene to Miocene volcanic and sedimentary rocks that are exposed along the basin margins.

The youngest deposits are recent alluvium (silt, sand and gravel mixtures) characteristic of an active fluvial environment. These are made up of shoreline, river channel, and adjacent floodplain deposits.

The Wacker Facility lies between U.S. Highway 30 (St. Helens Road) and the Willamette River, at the base of the Portland Hills. The facility was constructed on varying thicknesses of fill comprised of fine to medium sands and silts overlying alluvial floodplain deposits. Aquifers in the fill and floodplain deposits generally are unconfined and localized due to heterogeneity of the deposits. Occurring at various depths in the site vicinity, Columbia River Basalts (CRB) underlie these alluvial deposits. Deep wells installed in fractured CRB can be very productive and important supply wells. Site elevation is about 30 feet above mean sea level.

Pushprobe soil borings advanced along the river on the southeastern portion of the site during an October 1995 subsurface investigation found a surface cover of 4 to 6 inches of 1-inch minus crushed rock, with 4.5 to 7.5 feet of underlying fill comprised of fine to medium sand and sandy gravel. Soils beneath the fill consist of a somewhat



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tighter formation of interlayered silty fine and medium sands and clayey silts extending to depths of at least 36 feet.

In the southern portion of the site, groundwater has been encountered at depths of 14 to 25 feet bgs. In the area of the site's monitoring well network, groundwater flow appears to generally be toward North Doane Lake. However, since the site's monitoring well network covers only a portion of the site, information regarding overall groundwater flow is not available. Local topography suggests that site groundwater should generally flow to the northeast, toward the Willamette River.

Surface Drainage Routes

Site runoff is currently directed to the facility's oil/water separator system, which discharges to the Willamette River. Surface runoff at the southwestern edge of the site is directed along the Burlington Northern Railroad right-of-way via a stormwater catch basin, and discharges to the river about 1/2 mile to the southeast.

Air photos indicate that Doane Creek, which originates in the Portland Hills (Tualatin Mountains), historically passed beneath St. Helens Road near the northern corner of the Wacker facility, and reached the Willamette River by flowing along a route that approximates the current Wacker Siltronic / NWN property line. Beginning in the 1940's GASCO constructed a series of effluent settling lagoons in a low-lying area that extended onto the northwestern portion of the current Wacker Siltronic facility. Overflow from the various wastewater lagoons was directed to Doane Creek. In constructing the largest of these lagoons, a 7.5 acre lagoon, GASCO re-routed Doane Creek along the southwestern and southeastern edges of the lagoon. The creek reached the river along a route that passed beneath the location of Wacker Siltronic's current Process Building.

When developers began filling the Wacker site with rock and dredged river sediments in about 1969, Doane Creek was rerouted along a railroad right-of-way on the southwestern edge of the Wacker site. A catch basin near the southern corner of the Wacker property directed the surface water flow to an 84 inch diameter, concrete, underground storm sewer that passes along the southeastern Wacker property line and discharges to the Willamette River near the base of a Burlington Northern / Santa Fe Railroad bridge over the river (City of Portland Stormwater Outfall No. 22C).

During filling and development of the Wacker property, a drainage ditch, approximating the historic route of Doane Creek, and emptying to the Willamette River, was also constructed along the full length of the NWN/Wacker property line.

In 1986, NWN proposed installing an underground, perforated ceramic drain pipe along the southwestern edge of the Koppers tank farm to relieve water pressure on the containment structure wall, and



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eliminate groundwater infiltration into the tank farm. The drain line would have discharged through the city stormwater outfall at the northeast corner of Wacker. It's not known if the drain was ever installed, but deeper groundwater in this area of the Koppers site is contaminated, and historic Koppers materials loading/unloading spills in this area suggest a potential source for sediment contamination at the northeast end of the Wacker site.

Pathway Summary

The Wacker Facility lies just north of the Burlington Northern/Santa Fe Railroad Bridge in an area of mixed industrial, commercial, and residential use. Approximately 19 single family residences lie within 1/4 mile of the facility. The nearest residences lie southwest of the Wacker Facility across U.S. Highway 30.

The facility is fully fenced along its three upland sides, and is manned 24-hours a day so public access is limited. However, site workers could be exposed to contaminants present in surface soil. In addition, the presence of the Olympic Pipeline across the site indicates that utility trench workers could potentially be exposed to subsurface contaminants through direct contact, inhalation, or incidental ingestion.

Oregon Water Resources Department has a well log for at least one domestic water supply well within 1.0 mile of the Wacker facility. The well is located at much higher elevation to the northwest, along Old Germantown Road. The well is approximately 530 feet deep and is screened within broken basalt.

The nearest significant wetland is located along the west bank of the Willamette River, near the mouth of Multnomah Channel, about three miles downstream from the Wacker facility. North Doane Lake is located just south of the Wacker facility across the BNRR/SF railroad tracks. Because groundwater in the southern portion of the facility flows towards North Doane Lake, site contaminants have the potential to impact North Doane Lake.

Forest Park, a relatively undeveloped municipal park, lies to the northwest, west, and southwest, across U.S. Highway 30. Cathedral Park is located north of the Wacker facility on the east bank of the Willamette River.

Both recreational and subsistence fishing occur within the Lower Willamette River. Commercial fishing within the Portland Harbor is limited to a small Pacific lamprey fishery. Recreational boating, water skiing, swimming, and beach use also occur within the Harbor.

The Lower Willamette River provides habitat for 39 fish species, including populations of wild cutthroat trout, rainbow trout, and mountain whitefish. White sturgeon are plentiful within the Harbor. The Harbor is also an important migratory corridor, nursery habitat,



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and adult foraging area for two runs of chinook salmon, two runs of steelhead trout, and individual runs of coho and sockeye salmon.

Upper Willamette River populations of chinook and steelhead, which migrate through the Harbor, are listed as threatened species under the Federal Endangered Species Act. The Pacific lamprey is considered a federal species of concern.

Great blue herons, cormorants, osprey, mergansers, kingfishers, peregrine falcons, and bald eagles routinely forage within the Harbor. The area is also part of the wintering range for the Aleutian Canada goose. All are protected under the Migratory Bird Treaty Act. The peregrine falcon is federally listed as an endangered species, while the Aleutian Canada goose is federally listed as threatened species. The bald eagle also is a threatened species, but was recently proposed to be removed from this list.

There is little data on the nature and extent of the benthic community within Portland Harbor sediments. However, it is known that contamination in the benthos, which is a protected beneficial use, can be the source of food-chain effects that radiate up to the species listed above, including humans.

The Lower Willamette River is water quality limited for the following toxic compounds:

- Dioxins/furans (water column and sediments);
- Mercury (fish tissue);
- Pesticides (water column and sediments);
- Polynuclear Aromatic Hydrocarbons - PAHs - (water column and sediments); and
- Trace metals (water column and sediments).

A Total Maximum Daily Load requirements (TMDL)was established for 2,3,7,8-TCDD in 1991. The DEQ Water Quality Division is developing TMDLs for these other contaminants.

Conclusions/Recommendations

Contamination of river sediments adjacent to the Wacker site may represent a significant threat to human health and aquatic life within the river. The specific nature and significance of these threats cannot be determined without further characterization and delineation of contamination in groundwater, subsurface soil, and sediments. This conclusion is based on the following findings:

- Historical operations associated with oil gasification processes at the former GASCO site have resulted in petroleum related contamination at the Wacker site. This is evidenced by a review of aerial photographs, the presence of elevated levels of contamination adjacent to the Wacker/GASCO property line and the presence of petroleum contaminated soils encountered and treated



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during excavation activities associated with the construction of FAB 2. PAH concentrations detected in Willamette River sediments adjacent to the Wacker site exceed baseline concentrations by up to two orders of magnitude. Consequently, it appears that the Wacker site has contributed to the observed sediment contamination adjacent to the site. Although downstream concentrations of PAHs were more than twice the PAH concentration detected adjacent to the Wacker site, downstream contamination may be attributed to the known presence of tars at the former GASCO site.

- In addition to historical operations at the former GASCO facility, sediment contamination may also be attributed to pipeline leaks, AST leaks, spills or waste disposal activities associated with the former Western Transportation facility.

- Concentrations of 2,4-D and 2,4-DB were detected adjacent to the Wacker site at levels exceeding baseline concentrations. However, upstream levels of these contaminants exceed the levels detected adjacent to the Wacker site. In addition, concentrations of 2,4-D and 2,4-DB were highest at the upstream end of the Wacker site. Due to the presence of the former pesticide and herbicide manufacturer, Rhone-Poulenc upstream of the Wacker site, it does not appear that the presence of 2,4-D, and 2,4-DB in Willamette River sediments is related to the Wacker site.

- Wacker uses mercury and chromium in its processes. The site is known to have had chromium spills and discharges large volumes of wastewater known to have contained chromium. Sediment mercury concentrations exceed harbor baseline values approximately 250 feet downstream from the Wacker facility. In addition, chromium concentrations steadily increase along the full length of the Wacker site although chromium concentrations do not exceed baseline concentrations. Wacker also uses antimony in its process, however, sediments along the Wacker site were not analyzed for antimony.

- Wacker currently uses dioctylphthalate as a plasticizer. High concentrations of ethylhexylphthalate (approximately twice baseline concentrations) was observed along the Wacker site. It is unclear whether Wacker ever used this compound, However ethylhexylphthalate was detected in surface waters flowing into the city stormwater inlet that discharges adjacent to the Wacker site and has been detected in groundwater at the Wacker site.

Due the presence of contamination in both uplands and sediments and the high potential for significant groundwater contamination, DEQ has determined that a remedial investigation and feasibility study (RI/FS) is required for the Wacker Siltronics facility. The RI/FS should address potential risks to human health and the environment. The RI/FS should focus on upland as well as sediment issues and be completed in conjunction with harbor-wide investigative activities to



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be completed within the Portland Harbor Study Area. DEQ has determined that these actions warrant a high priority for follow-up.

References:

This following general references were consulted in preparing this Strategy Recommendation:


1. Preliminary Assessment Report, Wacker Siltronic Corporation, Portland, Oregon, prepared for USEPA by Ecology and Environment, Inc., October 1987.

2. DEQ Site Assessment Strategy Recommendation, Wacker Siltronic Corp., ECSI #183, May 15, 1993.

3. Wacker Siltronic Corporation, NL Gould Superfund Site; Doane Lake Study, Liability for Remedial Action Costs Under Oregon Lay, January 31, 1989 (Revised), by Marvin B. During, A Professional Services Corporation. (ECSI File #36, Doane Lake).

4. Region X Photo Analysis of Doane Lake Hazardous Waste Burial Site, Portland, Oregon, June 1980, EMSL-LV Project AMD 8031, Advanced Monitoring Systems Division, Environmental Monitoring Systems Division, Environmental Monitoring Systems Laboratory, Office of Research and Development, USEPA, Las Vegas, NV. (ECSI File #36, Doane Lake).

5. Site History, Wacker Siltronic Corporation, Portland, Oregon, by the Portland Development Commission, March 1985.

6. Hydrogeological Investigation of the Doane Lake Area, Portland, Oregon, prepared by Geraghty & Miller, Inc., or The Industrial Group, Doane Lake Area, February 22, 1991 (Doane Lake Area File, ECSI #36).

7. A Preliminary Report, Soil Investigation for Proposed Polysilicon Plant, Wacker Siltronic Corporation, for Wacker Siltronic Corp., by CH2M Hill Northwest, June 1985.

8. PRP 104(3) Response Final Report, Doane Lake Area, Portland, Oregon, prepared by Tetra Tech, Inc. for USEPA, July 1988.

9. Memorandum of Understanding, by the City of Portland, the Portland Redevelopment Corporation, and Wacker Chemical Corporation, April 1978.

10. First Amendment to Disposition and Development Agreement, between the City of Portland and Wacker Chemical Corporation, July 1978.

11. DEQ Air Contaminant Discharge Permit Files (Permit #26-3002) for Wacker Siltronics.




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12. Portland Harbor Sediment Investigation Report, Multnomah County, Oregon, prepared for US Environmental Protection Agency, by Roy F. Weston, Inc., May 1998.

Attachments:

Table 1: Willamette River Sediment Results

Table 2: Soil Data

Table 3: Groundwater Data (Monitoring Wells)

Table 4: Groundwater Data (October 1990 Investigation)

Figure 1: Site Location Map

Figure 2: Site Layout Map

Figure 3: Sediment Sample Locations

Figure 4: Sample Location Map



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# Table 1

| Contaminant | Units | Down-Stream SD065 0-17 cm | Down-Stream SD067 0-12 cm | Wacker Siltronic SD068 0-17 cm | SD069 0-15 cm | SD070 0-13 cm | SD072 0-14 cm | SD072A 0-84 cm | SD075 0-15 cm | SD077 0-10 cm | Up-Stream SD078 0-17 cm | Up-Stream SD080 0-13 cm | Apparent Portland Harbor Sediment Baseline Maximum Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | ppm | 39000 | 40400 | 37500 | 38300 | 35000 | 30900 | 35700 | 31700 | 30600 | 25500 | 40000 | 42800 |
| Antimony | ppm | NA | NA | NA | NA | NA | NA | <8 | NA | NA | NA | <5 | <5 |
| Arsenic | ppm | <5 | <5 | <5 | <9 | <8 | <9 | <8 | <9 | <10 | <8 | <5 | <5 |
| Barium | ppm | 179 | 190 | 168 | 179 | 167 | 150 | 189 | 180 | 153 | 149 | 175 | 195 |
| Beryllium | ppm | 0.7 | 0.7 | 0.65 | 0.7 | 0.7 | 0.6 | 0.6 | **0.9** | 0.7 | 0.5 | 0.7 | 0.7 |
| Cadmium | ppm | 0.4 | 0.4 | 0.5 | 0.5 | 0.4 | 0.4 | 0.6 | 0.6 | 0.4 | <0.3 | 0.4 | 0.6 |
| Chromium | ppm | 36.5 | 38.9 | 37 | 34.4 | 29.7 | 27.4 | 30.2 | 26.7 | 22.6 | 24.9 | 37.1 | 41 |
| Cobalt | ppm | 19 | 17.8 | 18.2 | **21.3** | **20.3** | 18.4 | **24.6** | **23.9** | **21.3** | 15.4 | 18.3 | 19.7 |
| Copper | ppm | 40.5 | 48.7 | 46.2 | 39.3 | 34.1 | 31.7 | 36.9 | 32.4 | 29.4 | 25.4 | 42.6 | 60 |
| Iron | ppm | 43100 | 43800 | 44100 | **54200** | **53000** | **51900** | **53900** | **64500** | **58600** | 41400 | 44200 | 45000 |
| Lead | ppm | 16 | 27 | 25 | 24 | 19 | 17 | 25 | 24 | 27 | 25 | 14 | 30 |
| Manganese | ppm | 699 | 624 | 681 | 725 | 638 | 591 | **863** | **909** | 605 | 487 | 693 | 810 |
| Mercury | ppm | 0.06 | 0.24 | 0.08 | 0.06 | 0.05 | 0.05 | 0.09 | 0.05 | 0.03 | 0.10 | 0.06 | 0.1 |
| Nickel | ppm | 30 | 32 | 30 | 27 | 25 | 22 | 25 | 22 | 21 | 25 | 30 | 32 |
| Selenium | ppm | 11 | **17** | 12 | **17** | **17** | **16** | 14 | **17** | 14 | 11 | 14 | 15 |
| Silver | ppm | 1.0 | 1.2 | 1.2 | **1.5** | 1.4 | 1.3 | 1.3 | **1.7** | **1.6** | 1.0 | 1.2 | 1.4 |
| Thallium | ppm | <5 | <5 | 5 | <9 | <8 | <9 | <8 | <9 | <10 | <8 | <5 | 13 |
| Titanium | ppm | NA | NA | NA | NA | **2840** | **2740** | **2850** | NA | **3200** | NA | NA | 2075 |
| Vanadium | ppm | 107 | **113** | 110 | **136** | **132** | **125** | **136** | **152** | **147** | 89.1 | 106 | 112 |
| Zinc | ppm | 104 | **150** | **134** | **144** | 117 | 113 | **145** | **120** | **124** | 100 | **131** | 118 |
| 2-Methylnaphthalene | ppb | **11000** | **7600** | **2700** | **210** | **530** | 130 | **980** | **180** | **430** | 24 | <19 | 150 |
| 4-Methylphenol | ppb | 300 | 250 | 160 | 64 | 73 | 250 | <110 | 97 | 68 | 48 | 500 | 680 |
| Benzoic Acid | ppb | <960 | <2000 | <200 | <200 | <190 | <200 | <1100 | <190 | <190 | <190 | <190 | <200 |
| Benzyl Alcohol | ppb | <96 | <200 | <20 | <20 | <20 | <20 | <110 | <19 | <19 | <19 | <19 | <20 |
| bis(2-Ethylhexyl)phthalate | ppb | <200 | <200 | 150 | 76 | 94 | 210 | 260 | **700** | <180 | **210** | **260** | 390 |
| Butylbenzylphthalate | ppb | <96 | <200 | <20 | <20 | <19 | <20 | <110 | <19 | <19 | <19 | <19 | <20 |
| Carbazole | ppb | **3600** | **1800** | **1700** | **3400** | **2000** | 86 | **660** | **170** | **700** | 40 | <19 | 100 |
| Di-N-Butylphthalate | ppb | <96 | <200 | <20 | <20 | <19 | <20 | <110 | <19 | <19 | <19 | **21** | <20 |
| Di-N-Octylphthalate | ppb | <96 | <200 | <20 | <20 | <19 | <20 | <110 | <19 | <19 | <19 | <19 | <20 |
| Dibenzofuran | ppb | **1600** | **1300** | **700** | **1900** | **2600** | **220** | **3600** | **340** | **160** | 20 | <19 | 100 |
| Dimethylphthalate | ppb | <96 | <200 | <20 | <20 | <19 | <20 | <110 | <19 | <19 | <19 | <19 | <20 |
| Pentachlorophenol | ppb | <480 | <1000 | <98 | <98 | <94 | <99 | <530 | **7.1** | **6.4** | **4.6** | **11** | Detect |
| Phenol | ppb | <96 | <200 | <20 | <20 | <19 | <20 | <110 | <19 | <19 | <19 | <19 | <20 |
| LPAHs (total) | ppb | **165600** | **112400** | **60430** | **65680** | **70574** | **4995** | **31500** | **13490** | **6860** | 425 | 337 | 700 |
| HPAHs (total) | ppb | **268800** | **192000** | **89800** | **58390** | **46990** | **8630** | **18860** | **15260** | **9060** | **3034** | 2134 | 2400 |
| DDTs (total) | ppb | NA | NA | NA | NA | 49.1 | 27.3 | 38.5 | 170 | 163 | **380** | **570** | 220 |
| PCBs (total) | ppb | NA | NA | NA | NA | 51 | <40 | 57 | NA | <760 | NA | NA | <180 |
| Organotins (total) | ppb | NA | NA | NA | NA | 16 | 54 | <22.8 | NA | 44 | NA | NA | 300 |
| 2,4-D | ppb | NA | NA | NA | NA | NA | NA | NA | **9** | **24** | **21** | **93** | <3.3 |
| 2,4-DB | ppb | NA | NA | NA | NA | NA | NA | NA | **19** | **13** | **23** | **130** | <5 |
| TOC | % | 1.5 | **2.2** | 1.8 | 1.1 | 1.1 | 0.97 | 1.2 | 0.89 | 1.3 | 0.98 | 1.5 | 1.75 |
| Water Depth | ft | 10 | 17 | 17 | 9 | 7 | 9.5 | 8 | 10 | 10 | 10 | 36 | |

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**Table 2**
**Wacker Siltronic Soil Data**

| | | Date | SS-1 | SS-2 | SS-3 | SS-4a | SS-4b | SS-5 | SS-6 | SS-7a | SS-7b |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chlorobenzene | ppm | 4/30/1985 | 0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 |
| Phenol | ppm | 4/30/1985 | 0.35 | 3.1 | 0.2 | 0.3 | 0.17 | 0.07 | 0.05 | 0.06 | 0.08 |
| o-Cresol | ppm | 4/30/1985 | 0.04 | 3.4 | ND | 0.02 | ND | 0.19 | 0.05 | ND | ND |
| m+p-Cresols | ppm | 4/30/1985 | 0.006 | ND | ND | 0.08 | ND | ND | ND | ND | ND |
| 2,4-Dimethylphenol | ppm | 4/30/1985 | ND | 3.1 | ND | ND | ND | 0.22 | 0.17 | ND | ND |
| 2-Nitrophenol | ppm | 4/30/1985 | ND | 0.20 | ND | ND | ND | ND | ND | ND | ND |
| 2,4-Dinitrophenol | ppm | 4/30/1985 | ND | ND | ND | ND | ND | 0.81 | ND | ND | ND |
| 2-Chlorophenol | ppm | 4/30/1985 | ND | 7.8 | 0.08 | 0.26 | ND | ND | 0.13 | ND | 0.14 |
| 3+4-Chlorophenols | ppm | 4/30/1985 | 0.44 | 17.5 | 0.06 | ND | ND | 1.7 | 0.32 | ND | ND |
| 2,4-Dichlorophenol | ppm | 4/30/1985 | ND | 2.7 | ND | ND | ND | 0.24 | ND | ND | ND |
| 2,4,5-Trichlorophenol | ppm | 4/30/1985 | ND | 1.9 | ND | ND | ND | ND | ND | ND | ND |
| 2,4,6-Trichlorophenol | ppm | 4/30/1985 | ND | ND | ND | ND | ND | 0.22 | ND | ND | ND |
| 2,3,4,5-Tetrachlorophenol | ppm | 4/30/1985 | 4.9 | 256 | ND | 0.4 | ND | 0.23 | 4.7 | 0.06 | 0.25 |
| 2,3,4,6-Tetrachlorophenol | ppm | 4/30/1985 | 0.24 | ND | ND | ND | ND | ND | ND | 1 | ND |
| 2,3,5,6-Tetrachlorophenol | ppm | 4/30/1985 | ND | 4 | ND | 0.58 | 0.11 | 0.33 | 0.55 | ND | 0.46 |
| Pentachlorophenol | ppm | 4/30/1985 | <1 | <1 | <1 | <1 | 0.31 | 6.9 | 5.1 | <1 | <1 |
| 2,4-D (EP-Tox) | ppm | 4/30/1985 | <10 | <10 | <10 | <10 | <10 | 10 | 160 | <10 | <10 |
| Naphthalene | ppm | 4/30/1985 | 6.7 | 360 | <1 | <1 | <1 | 230 | <1 | <1 | <1 |
| Acenaphthylene | ppm | 4/30/1985 | 5.6 | 230 | <1 | <1 | <1 | 24 | <1 | <1 | <1 |
| Acenaphthene | ppm | 4/30/1985 | 8 | 560 | <1 | <1 | <1 | 28 | <1 | <1 | <1 |
| Fluorene | ppm | 4/30/1985 | 5 | 290 | <1 | <1 | <1 | 20 | <1 | <1 | <1 |
| Fluoranthene | ppm | 4/30/1985 | 16 | 530 | <1 | <1 | <1 | 50 | <1 | 1.1 | <1 |
| Pyrene | ppm | 4/30/1985 | 18 | 550 | <1 | <1 | <1 | 57 | <1 | 1.2 | <1 |
| Phenanthrene+Anthracene | ppm | 4/30/1985 | 32 | 1400 | 3 | <1 | <1 | 150 | <1 | 1.6 | <1 |
| Chrysene | ppm | 4/30/1985 | 12 | 92 | <1 | <1 | <1 | 36 | <1 | 1.7 | <1 |
| Benzo(b+k)fluoranthene | ppm | 4/30/1985 | 8 | 120 | <1 | <1 | <1 | 200 | <1 | <1 | <1 |
| Benzo(a)pyrene | ppm | 4/30/1985 | 19 | 120 | <1 | <1 | <1 | 100 | <1 | <1 | <1 |
| Indeno(1,2,3-c,d)pyrene | ppm | 4/30/1985 | <1 | 270 | <1 | <1 | <1 | 7 | <1 | <1 | <1 |
| Benzo(g,h,l)perylene | ppm | 4/30/1985 | <1 | 360 | <1 | <1 | <1 | 25 | <1 | <1 | <1 |
| Oil and Grease | % | 4/30/1985 | 0.34 | 0.15 | 0.059 | 0.914 | 0.03 | 0.19 | 0.054 | 0.065 | 0.059 |

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**Table 3**
**Wacker Groundwater Data (mg/l)**

| | GW-1 (8/85) | GW-2 (8/85) | GW-3 (8/85) | GW-3I (10/90) | GW-4 (8/85) | GW-5 (8/85) | GW-6 (8/85) | GW-7 (8/85) | GW-7 (10/90) |
|---|---|---|---|---|---|---|---|---|---|
| Volatile Organic Compounds | | | | | | | | | |
| Benzene | 1.1 | 0.1 | 0.39 | ND | ND | ND | 1.2 | ND | ND |
| Toluene | ND | ND | ND | ND | ND | ND | | ND | ND |
| Ethylbenzene | 0.41 | ND | ND | ND | ND | ND | 0.35 | ND | ND |
| Xylene (Total) | 1.2 | 0.032 | ND | ND | 0.015 | ND | 0.43 | ND | ND |
| Semivolatile Organic Compounds | | | | | | | | | |
| Phenol | ND | ND | ND | 0.003 | ND | ND | ND | ND | ND |
| 2,4-Dimethylphenol | 0.027 | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-Methylnaphthalene | | 0.26 | 0.067 | | 0.019 | 0.012 | 0.041 | ND | ND |
| Acenapthene | 0.27 | 0.94 | 0.086 | 0.093 | 0.35 | 0.054 | 0.2 | 0.019 | 0.002 |
| Acenaphthylene | 0.088 | 0.2 | ND | 0.002 | ND | 0.031 | 0.032 | ND | ND |
| Anthracene | 0.039 | 0.63 | ND | 0.002 | ND | ND | ND | ND | ND |
| Benzo(a)anthracene | 0.031 | 0.48 | ND | ND | ND | ND | ND | 0.012 | ND |
| Benzo(a)pyrene | 0.04 | 0.76 | ND | ND | ND | ND | ND | 0.01 | ND |
| Benzo(b)fluoranthene | 0.024 | 0.4 | ND | ND | ND | ND | ND | ND | ND |
| Benzo(ghi)perylene | 0.025 | 0.37 | ND | ND | ND | ND | ND | ND | ND |
| Benzo(k)fluoranthene | ND | 0.12 | ND | ND | ND | ND | ND | ND | ND |
| Chrysene | 0.036 | 0.65 | ND | ND | ND | ND | ND | 0.015 | ND |
| Dibenzo(ah)anthracene | ND | ND | ND | ND | ND | ND | ND | | ND |
| Indeno(123-cd)pyrene | 0.02 | 0.3 | ND | ND | ND | ND | ND | ND | ND |
| Dibenzofuran | 0.077 | 0.075 | ND | 0.004 | ND | ND | 0.024 | ND | 0.003 |
| Fluoranthene | 0.073 | 1.38 | ND | 0.005 | ND | ND | ND | 0.023 | 0.003 |
| Fluorene | 0.095 | 0.44 | 0.013 | 0.022 | 0.053 | 0.012 | 0.035 | ND | 0.003 |
| Naphthalene | ND | 1.9 | 0.6 | 0.77 | 0.35 | 0.058 | 2.1 | ND | 0.005 |
| Phenanthrene | 0.19 | 0.63 | 0.013 | 0.006 | 0.028 | 0.021 | 0.056 | ND | ND |
| Pyrene | 0.081 | 1.43 | ND | 0.004 | 0.014 | 0.01 | 0.01 | 0.011 | ND |
| Carcinogenic PAHs | 0.176 | 3.08 | ND | ND | ND | ND | ND | 0.037 | ND |
| Non-Carcinogenic PAHs | 0.913 | 7.885 | 0.779 | 0.908 | 0.814 | 0.198 | 2.498 | 0.053 | 0.016 |

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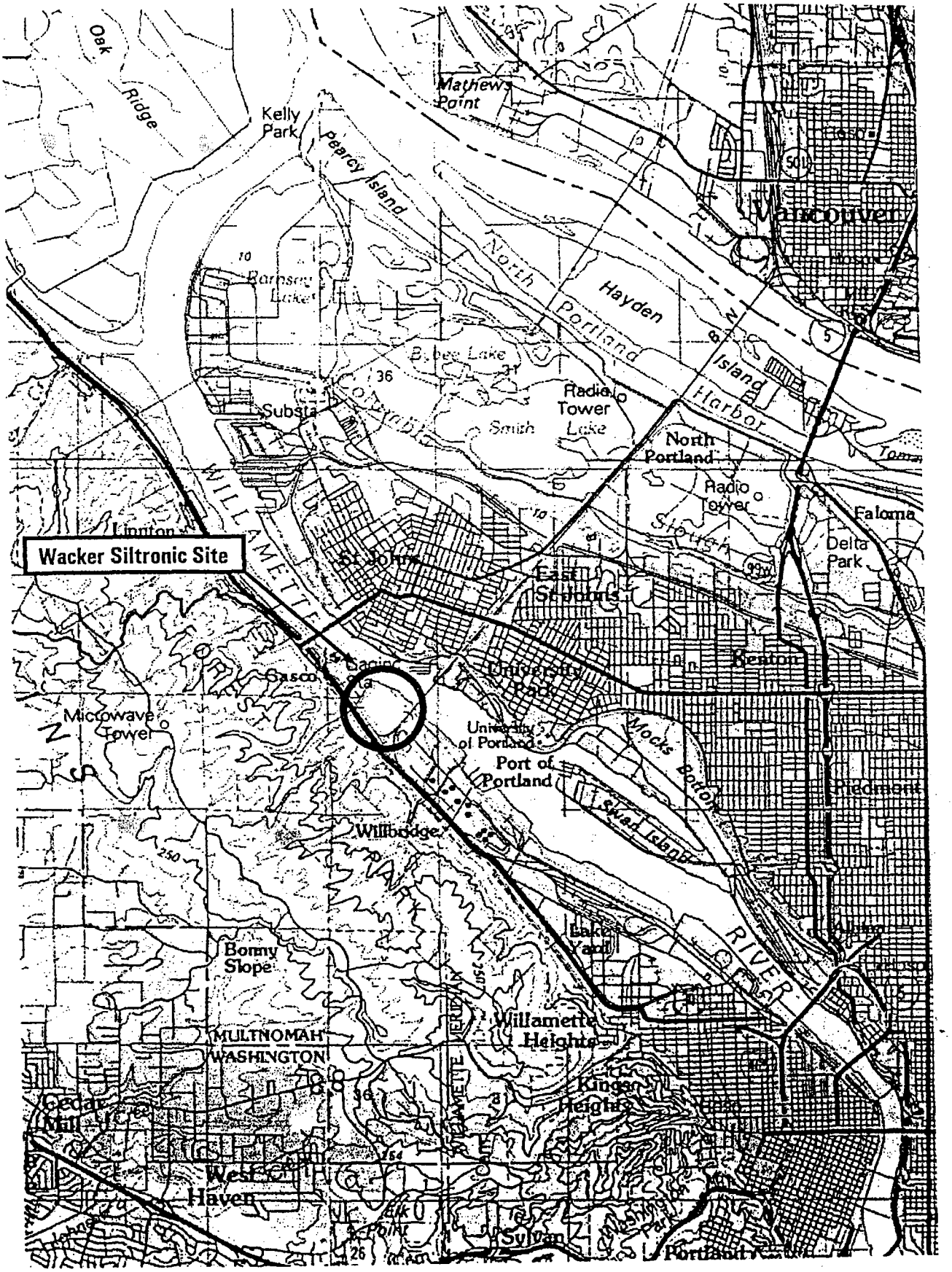
# TABLE 4
## Wacker Siltronic - TPH and BTEX in Groundwater - October 1990

( all concentrations in ppb)

| Sampling Point | Benzene | Toluene | Ethylbenzene | Xylenes | TPH | |
|---|---|---|---|---|---|---|
| GW-01 | <0.1 | 221 | <0.1 | <0.2 | <0.1 | |
| GW-02 | **181** | <0.1 | <0.1 | <0.2 | 131 | |
| GW-03 | **13.5** | 1.8 | 1.5 | 5.6 | 43.6 | |
| GW-04A | **391** | <0.1 | 68 | 45 | 406 | Gasoline |
| GW-04B | **384** | 7.1 | 75 | 55 | 397 | |
| GW-05 | --- | --- | --- | --- | --- | |
| GW-06 | **59.8** | 4.6 | 196 | 17.9 | 510 | Gas+Diesel |
| GW-07 | **17,560** | 13.1 | 126 | 176.6 | 17,000 | |
| GW-08 | **285** | <0.1 | 129 | 65.4 | 369 | Diesel |
| GW-09 | **371** | 13.1 | 74.4 | 66.6 | 791 | Gasoline |
| GW-10 | **1,820** | 23.9 | 471 | 427 | 5,090 | Diesel |
| GW-11A | **18,100** | **3,910** | **2,520** | 3,510 | 56,500 | Gas+Diesel |
| GW-11B | **23,270** | **5,960** | **4,680** | 6,450 | 89,140 | |
| GW-11C | **18,470** | **5,590** | **4,510** | 6,422 | 88,240 | |
| GW-14 | **8.6** | <0.1 | <0.1 | <0.2 | 74.7 | |
| GW-15 | **23.2** | <0.1 | 75.9 | 21.3 | 1,330 | |
| GW-16 | **12,600** | 214 | **1,680** | 1,918 | 21,400 | Diesel |
| GW-17A | **11,300** | 662 | **1,680** | 2,358 | 24,900 | Diesel |
| GW-17B | **10,925** | 574 | **1,370** | 2,042 | 19,350 | |
| GW-18 | **250** | 20.4 | 64.2 | 87.3 | 623 | Gasoline |
| GW-19 | **52.4** | <0.1 | 13.8 | 20.6 | 148 | Gasoline |
| GW-20A | **2,920** | 80.6 | **1,690** | 1,903 | 16,600 | Diesel |
| GW-20B | **3,120** | 85.6 | **1,720** | 1,897 | 14,500 | |
| GW-21 | **2,510** | 349 | 37.6 | 99.6 | 3,140 | |
| GW-22A | <0.1 | <0.1 | <0.1 | <0.2 | 12.1 | |
| GW-22B | 1 | 0.7 | <0.1 | <0.2 | 18.1 | |
| GW-23 | **335** | <0.1 | 419 | 91.9 | 635 | |
| GW-24 | **4,780** | 594 | **926** | 1,550 | 6,330 | Diesel |
| GW-25A | **<0.1** | <0.1 | <0.1 | <0.2 | 26.8 | Diesel |
| GW-25B | **3.7** | <0.1 | <0.1 | 3.6 | 25.3 | |
| GW-26 | **5,920** | 910 | 584 | 881 | 12,040 | Diesel |
| GW-27A | **10,300** | 627 | **1,220** | 1,847 | 16,300 | Diesel |
| GW-27B | **11,400** | 320 | **1,340** | 2,086 | 20,800 | |
| GW-28 | **349** | 9.7 | <0.1 | 22.4 | 328 | |
| GW-29 | **541** | <0.1 | 263 | 19.4 | 735 | |
| **Drinking Water MCL:** | 5 | 1,000 | 700 | 10,000 | ----- | |
| **Fresh Water Aquatic Toxicity -** | | | | | | |
| **Acute:** | 5,300 | 17,500 | 32,000 | ----- | ----- | |
| **Chronic:** | ----- | ----- | ----- | ----- | ----- | |

# FIGURE 1

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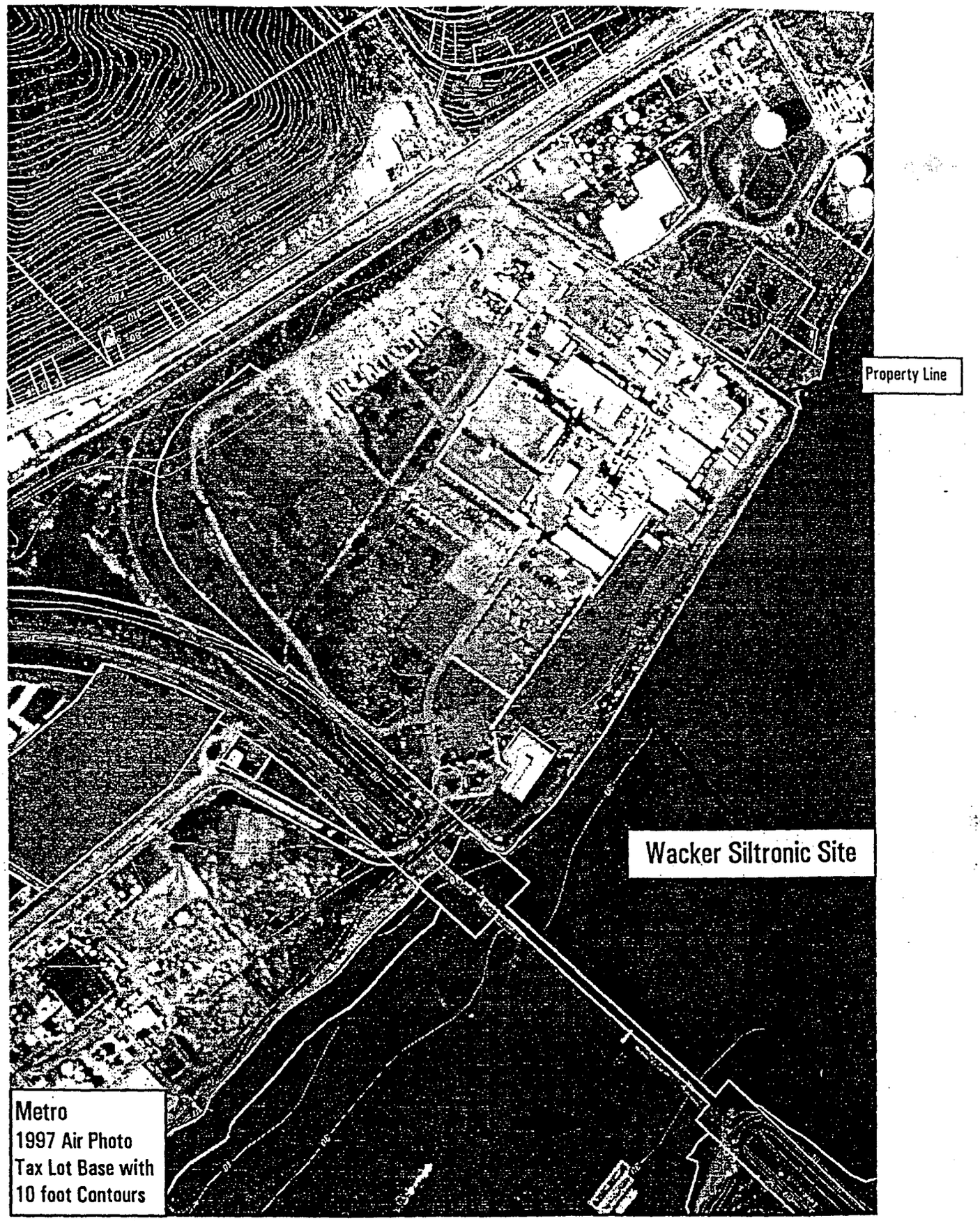
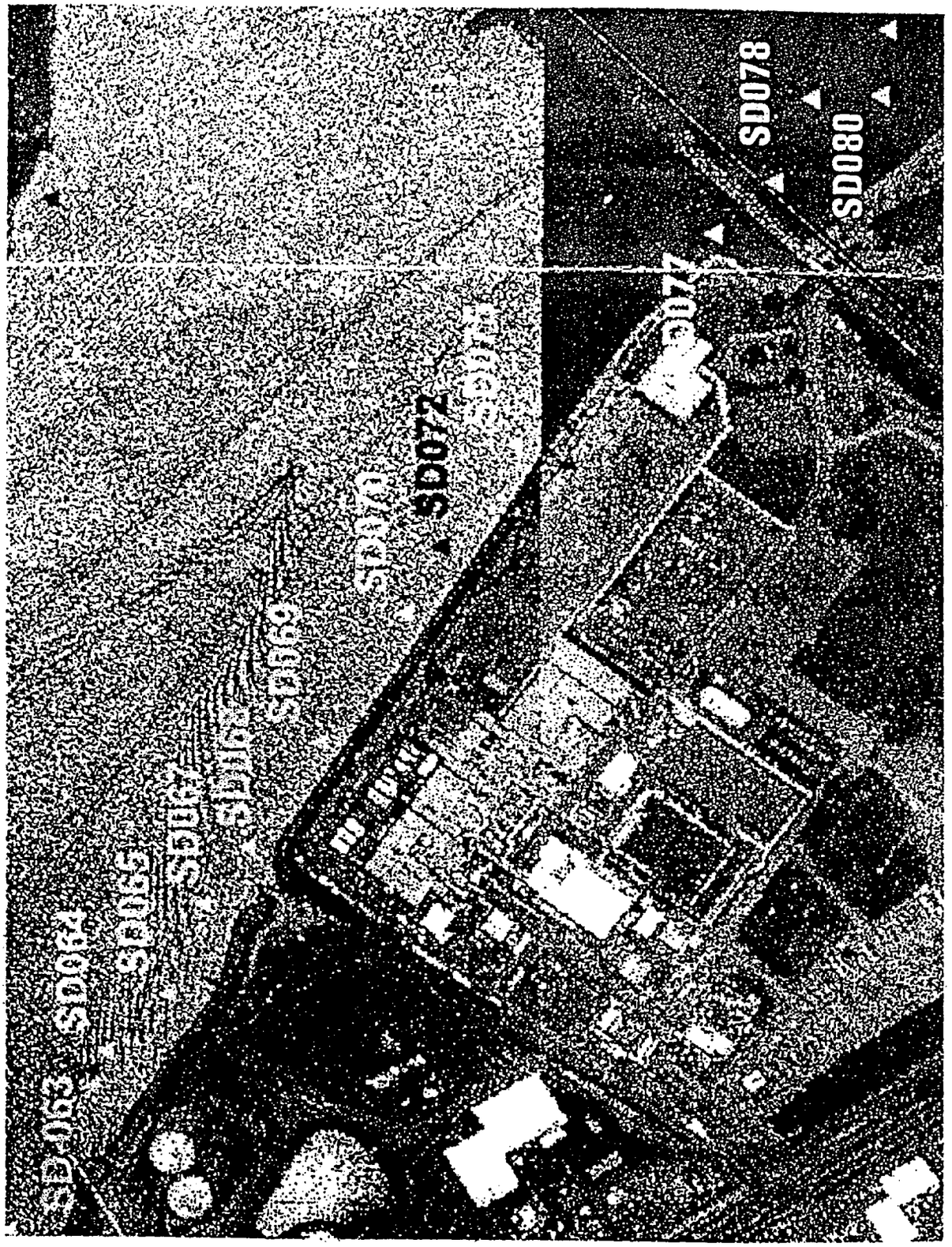
# FIGURE 2


Property Line
Wacker Siltronic Site
Metro
1997 Air Photo
Tax Lot Base with
10 foot Contours

# FIGURE 3



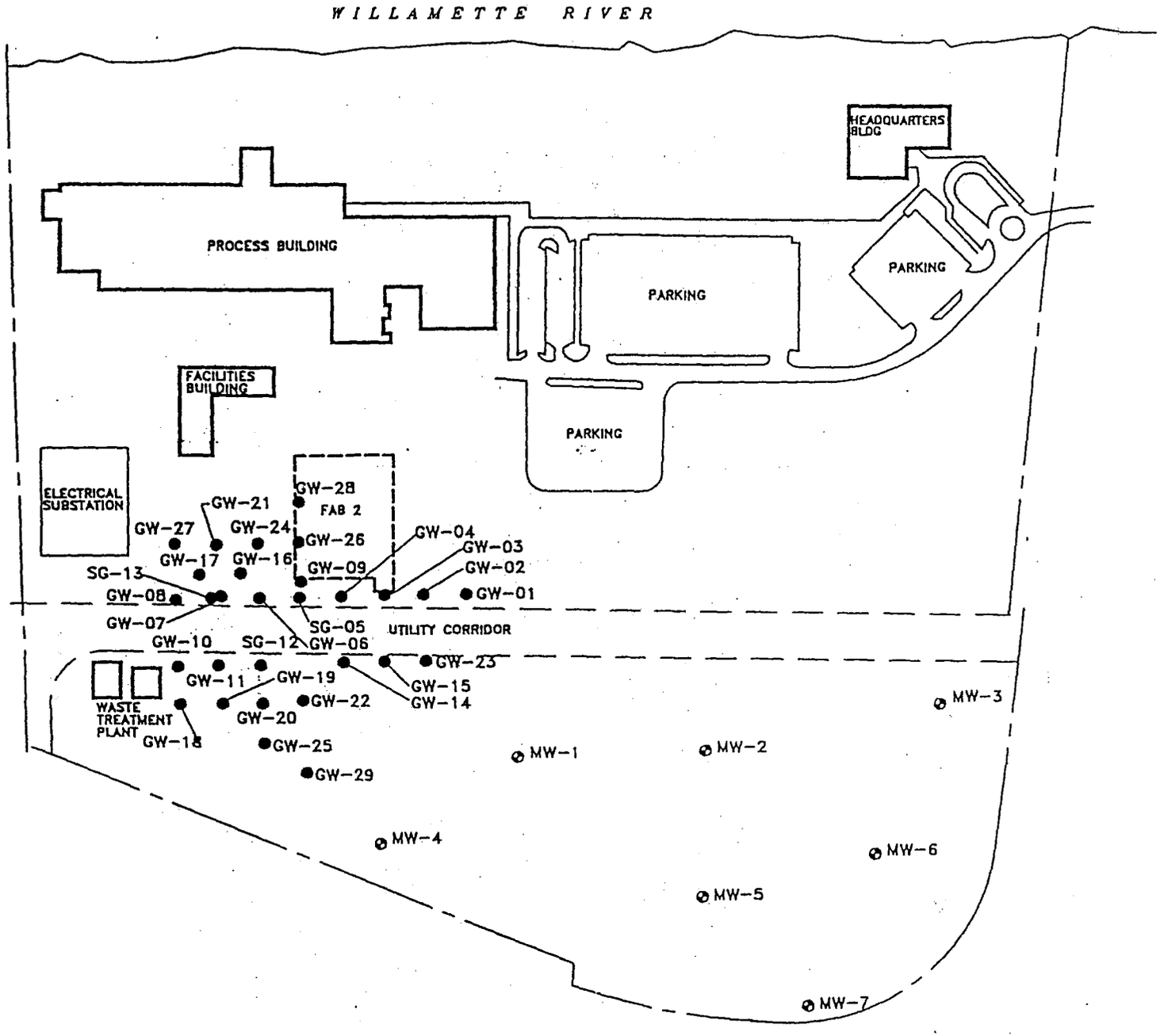



FIGURE 4

Figure 2
SITE PLAN
WACKER SILTRONIC CORPORATION
PORTLAND, OREGON

CH2M HILL

SCOEPA0010816

# Supplement to DEQ's Strategy Recommendation for the Wacker Siltronic Facility

Prepared for Wacker Siltronic Corporation

March 10, 1999

BRIDGEWATER GROUP, INC.

03/13/00

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SCOEPA00010819

# INTRODUCTION

DEQ premised its request for Wacker Siltronic Corporation (Wacker Siltronic) to conduct a remedial investigation on *suspected* links between specific hazardous substance releases or past operations and contamination documented by EPA in sediments adjacent to the Wacker Siltronic facility. Bridgewater Group, Inc. (Bridgewater Group) has reviewed Wacker Siltronic's permit files, site investigation records, spill cleanup files, and property development history. Our analysis indicates that there are no links between Wacker Siltronic's past or current operations and constituents detected in sediments adjacent to the facility.

Bridgewater Group's analysis is presented in this document. The document includes the following:

- An expanded site history that supplements DEQ's *Strategy Recommendation* and provides additional information on site development and past operations.
- An analysis of why Wacker Siltronic's past or current operations are not the source of the constituents detected in Willamette River sediments above Portland Harbor baseline values



SCOEPA00010820

# SITE DEVELOPMENT HISTORY

## Introduction

This section provides a revised and updated description of the site development history for the Wacker Siltronic facility located at 7200 NW Front Avenue in Portland, Oregon (see Figure 1). The information provided herein is being provided to DEQ to supplement the Wacker Siltronic facility *Strategy Recommendation* and to establish the technical basis for good faith negotiations between Wacker Siltronic and DEQ.

## Pre 1900 - 1978

### Property Ownership

According to a March 7, 1985 document entitled *Site History, Wacker Siltronic Corporation, Portland, Oregon* (Portland Development Commission, 1985), as of 1906 the Spokane, Portland and Seattle Railroad owned all or most of the property now occupied by the Wacker Siltronic facility. In 1962, Victor Rosenfeld and H.A. Andersen purchased the property. In 1964, an interest in the property was conveyed to Gilbert Schnitzer. These parties retained ownership until 1978 when the property was purchased by the Portland Development Commission (PDC).

### Site Activities

Prior to 1900, the property was essentially undisturbed lowlands. A portion of the property contained part of a small, shallow lake known as Doane Lake. The property was swampy and subject to flooding in the winter and spring. A creek ran through the property, which was reported to have contained fish in the early part of the century.

In 1908, the Astoria and Columbia River Railroad constructed a double track railroad bridge across Doane Lake and the Willamette River. The railroad track berm split Doane Lake (see Figure 2).

Railroad construction was the only activity conducted on the property until sometime in the mid-1930's when several small marine terminal operations were active on the property. Western Transportation had five small buildings, two piers, and two storage tanks on the riverbank near the railroad bridge. The structures associated with this operation are shown in Figures 2 and 3.

According to the *Site History*, Western Transportation refueled tugs and moored log rafts and barges along the property waterfront. Access to



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Western Transportation's operation was from the east-southeast on a road under the railroad bridge.

Shell Oil Company had a building and dock near the northern corner of the property (see Figures 2 and 3). Shell shipped a by-product produced by the nearby Portland Gas & Coke (PG&C) facility by barge from its dock.

PG&C built a residual oil gasification facility, known as the GASCO facility, in 1913 (CDM, 1987). The plant produced 570 Btu town gas and pressed lampblack briquettes. In 1923, the gasification process was modified to increase aromatic generation and light oil recovery for motor fuel. Two years later, tar recovery and refining were initiated to provide tar for use as road binder. During the 1930's, the plant was expanded and in 1941 a coking plant began production of electrode grade coke and high Btu gas. The plant was shut down in 1956[1].

As part of PG&C's plant expansions that occurred in the 1930s and early 1940s, four effluent settling basins were installed on the eastern portion of their site. Several of these ponds were located on what is now the Wacker Siltronic property (see Figures 4 and 5). These settling basins received discharges from tar boxes and lampblack thickeners. Periodic flooding such as that which occurred in June 1948 (see Figure 6), may have scoured some of the tars deposited in the ponds (CDM, 1987). Prior to the construction of these ponds, tar may have been discharged directly to the river and to low-lying areas (CDM, 1987). Also, PG&C occasionally cleaned out the ponds and placed the dredged materials in low-lying areas, possibly onto what is now the Wacker Siltronic property (CDM, 1987).

During filling of the adjacent Wacker Siltronic property, the three settling ponds were eliminated and according to CDM (1987), the tar was incorporated into the soil fill material in a low lying area paralleling the northwest boundary of Wacker Siltronic's property (see Figures 7 through 10).

From at least 1952 to the mid-1960s, PG&C also stored lampblack on what is now the Wacker Siltronic property. Lampblack may have been discharged to the river and later to the settling ponds (CDM, 1987). Other wastes such as plant demolition rubble, tank bottom sludges, and other miscellaneous wastes may have been disposed in low-lying areas on what is now the Wacker Siltronic property (CDM, 1987). Wacker Siltronic has encountered demolition debris in several onsite excavations.

According to the *Site History*, PG&C contracted with Jack Eatch Construction Company at the nearby rock quarry to provide fill for the property, construct drainage ditches, and perform some clearing operations. Aerial photographs for the early 1960s through 1967 show how land-clearing operations on the property progressed from west to east (see Figures 8 through 10).

By 1957, the Western Transportation dock and piers were removed (see Figure 7). According to the *Site History*, the Shell Oil facility was abandoned by 1957.

[1] PG&C became Northwest Natural Gas, the predecessor to Northwest Natural, in 1958. Northwest Natural Gas constructed a liquefied natural gas storage tank in the late 1960s and most of the old gasification plant facilities were demolished.



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The Wacker Siltronic property apparently remained idle from the late 1950s until May 23, 1966 when filling activities started (see Figures 10 and 11). The purchasers (i.e., Victor Rosenfeld and H.A. Andersen) agreed to fill the property to a minimum elevation of thirty feet by December 31, 1973 and to construct industrial buildings on the site by December 31, 1978.

Approximately 1,500,000 cubic yards of imported material were placed on the property. According to the *Site History*, approximately 700,000 cubic yards of material came from hydraulic dredging of the Willamette River. The remaining material came from the rock quarry located on the other side of Highway 30, immediately west of the property. Figure 11 is an aerial photograph of the property taken in 1971. It shows the berm constructed along the shoreline of the Willamette River, filling of the property with dredged materials, and the turbid discharge of water from the filling operation back into the Willamette River.

The Portland Planning Commission approved the request to fill the site. Site filling was completed by December 6, 1975. By 1973, the structures associated with both the Western Transportation and Shell Oil operations were no longer present at the property (see Figure 12). Also by 1967, an unnamed stream that drained the northeast slopes of the Tualatin Mountains, including the area occupied by the rock quarry, was channelized to route water through a ditch and culverts around the southern edge of the property (see Figure 10). The unnamed stream formerly ran across the northwest portion of the property (see Figure 9).

The DEQ *Strategy Recommendation* states that this ditch receives drainage from the Wacker Siltronic property. Bridgewater Group has reviewed the grading plan for the property and has found that none of the property drains to the ditch. Almost all of the facility storm water is collected and conveyed through the combined effluent outfall which discharges to the Willamette River at the far northwest corner of the property. Storm water from the Fab 2 Building area discharges through a separate outfall located at about the center of the property. Two of the Administration Building downspouts discharge through a separate outfall that runs along the west side of the building. The other two Administration Building downspouts and one catch basin near the main entrance (in the turnaround) discharge to a City of Portland storm water outfall that discharges just downstream of the Railroad Bridge.

As is shown in Figure 13, the property was completely filled and was ready for development by the end of 1977.

# 1978 - Present

## Property Ownership

In 1978, the PDC purchased the property as part of a 360-acre urban renewal project. The area included in the project was characterized by poor access and a lack of major utility services. The City of Portland, through PDC, sold $15 million in urban redevelopment bonds to finance purchase of land,



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improvement and realignment of streets, relocation of an existing gas main, and installation of two major storm sewers that would serve the surrounding area. PDC in turn sold 85 acres to Wacker Siltronic on August 17, 1978 for construction of a new silicon wafer plant. Figure 14 shows the property in October 1978 with preliminary plant construction activities underway.

Wacker Siltronic's purchase came at the end of a two-year process where Wacker Chemie of Munich, Federal Republic of Germany, sought a location in the United States for a new silicon wafer plant. Wacker Siltronic, their transaction lawyers, and their design engineer did not suspect that hazardous substances were present at the site prior to the transaction. Wacker Siltronic consulted with DEQ, the City of Portland, the U.S. Army Corps of Engineers, Port of Portland, and Portland Chamber of Commerce regarding environmental requirements and permits needed for the site. PDC offered no information to the prospective purchaser, Wacker Siltronic, about the presence of hazardous substances. DEQ did not inform Wacker Siltronic about the potential presence of hazardous substances, even after the agency sent a representative to Germany to work with Wacker Siltronic on environmental issues.

Wacker Siltronic did not become aware of the potential presence of coal tar residues on its property until 1984 when the Company announced its intent to construct a large polysilicon production plant in the southern portion of the property. In April of 1985, as part of the preliminary engineering for design and construction of the proposed polysilicon plant, Wacker Siltronic confirmed the presence of petroleum products, polynuclear aromatic hydrocarbons (PAHs), and the pesticide 2,4-D in soil in the proposed construction area (CH2M HILL, 1985a). Later in 1985, Wacker Siltronic collected a series of air samples to ensure that its employees were not being exposed to hazardous vapors (CH2M HILL, 1985b). In June 1985, Walker Siltronic formally notified the U.S. Environmental Protection Agency (EPA) regarding the potential for the property to be a hazardous waste site as required under Section 103(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

## Site Activities

Construction of Wacker Siltronic's new plant began immediately after the property was purchased. Construction was completed in December 1979, and operation began in March 1980.

In 1995, Wacker Siltronic significantly expanded the production capacity of the Portland facility by constructing the Fab 2 Building.

**DEQ's *Strategy Recommendation* states that "...Surface runoff at the southwestern edge of the site is directed along the Burlington Northern Railroad right-of-way via a stormwater catch basin, and discharges to the river about ½ mile to the southeast." This is incorrect. According to a topographical map for the property (see Appendix A), no surface runoff from the southwestern edge of the site drains toward the railroad right-of-way.** All surface runoff is captured onsite and discharged through the combined effluent outfall, the Fab 2 Building stormwater outfall, the Adminstration Building roof drain outfall, or the City of Portland stormwater



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outfall. Koppers Industries discharges stormwater to the ditch the runs along the railroad right-of-way.

## Spills or Releases

DEQ's *Strategy Recommendation* references several spills or releases that occurred after the time that Wacker Siltronic purchased the property. This section provides supplemental information regarding these spills or releases, and the Company's investigation and cleanup activities.

### *1979 Olympic Pipeline Petroleum Release*

Olympic Pipeline operates two product lines that are buried within a utility corridor that transects the Wacker Siltronic property from north to south (see Figure 15). One pipeline conveys diesel and kerosene. The other conveys gasoline.

Wacker Siltronic discovered a petroleum release in February 1979 while excavating the foundation for a clarifier in the wastewater treatment plant area. A sample of diesel obtained from the pipeline was analyzed and found to match a sample collected from the clarifier excavation. Wacker Siltronic notified Olympic Pipeline regarding the potential for a leak in one or both of their product lines. Olympic Pipeline excavated and exposed their pipelines. Holes were discovered in a section of the pipeline and oil was found along a portion of the utility corridor to the northwest and southwest of the clarifier excavation. Wacker or Olympic Pipeline notified DEQ of the release and the agency visited the plant site in February of 1979.

Olympic Pipeline replaced the section of leaking pipeline. They also addressed floating product found in the clarifier and pipeline excavations by excavating a water separation pit southeast of the clarifier excavation and then pumping floating product and water into the pit. Olympic Pipeline then skimmed the floating product from the pit and pumped it into tanker trucks. After completing the skimming operation, Olympic Pipeline backfilled the pit. They also removed residual oil and stained soil remaining in the bottom of the clarifier excavation. Wacker Siltronic does not have a record of any cleanup action or closure report for this release.

### *1980 Chromium Release*

According to DEQ's *Strategy Recommendation*, chromium was found in the Wacker Siltronic wastewater treatment plant concentrated acid system on December 16, 1980. On that date, chromic acid entered a concentrated acid drain. Some of the acid was treated in the neutralization tank and discharged before the acid release was observed. When Wacker Siltronic staff observed a green color in the plant's wastewater, the source of the chromic acid was found and stopped. An estimated 5.5 pounds of chromium was captured within the plant's wastewater treatment plant and taken to the hazardous waste landfill in Arlington, Oregon for disposal. None of the chromic acid was released to soil underlying the wastewater treatment plant. However, approximately 1.3 pounds of chromium was discharged to the Willamette



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River. This one time release is small when compared to the permitted discharge limits specified in Walker Siltronic's NPDES Waste Discharge Permit No. 93450. This permit allows Wacker Siltronic to discharge up to 0.5 pounds per day of total chromium as a monthly average and up to 1 pound per day as a daily maximum. Wacker Siltronic's actual average total chromium discharge is far less than is allowed by its permit. Wacker Siltronic only discharges between 0.02 and 0.03 pounds per day, or 7 to 11 pounds per year.

### *1981 Chromic and Nitric Acid Leak*

According to DEQ's *Strategy Recommedation*, chromic acid was spilled after a tank overflowed. The chromic acid entered a floor drain and sump at the Wacker Siltronic facility.

Bridgewater Group reviewed Wacker Siltronic's spill records and found that the acid etch solution from a rinse operation in the materials characterization production area did enter a floor drain and sump, but there was no release to soil or surfacewater. The sump had a transfer pump that conveyed the acid to a storage tank. When the storage tank was completely filled it overflowed into the secondary containment for the storage tank. Flow into the storage tank and to its secondary containment continued until the source of the leak was discovered. Flow into the tank was stopped before the acid was able to overtop the secondary containment. Wacker Siltronic brought in a tanker truck to remove the acid and rinse water solution. Approximately 6,000 gallons of acid and rinse water solution were treated and disposed at the hazardous waste landfill in Arlington, Oregon.

### *1984 Trichloroethylene Spills*

In December of 1984, two trichloroethylene (TCE) spills occurred from its TCE Stripper. The first spill occurred on December 3, 1984. A solution containing TCE was spilled when a surge tank overflowed. Wacker Siltronic estimated that 0.33 gallons of TCE were spilled. Wacker Siltronic determined that this spill did not exceed reportable quantity requirements. The second spill occurred on December 31, 1984, again due to overflow from a surge tank. Wacker Siltronic estimated that 11.6 gallons of TCE were spilled. This spill was reported to DEQ.

On January 2, 1985, Wacker Siltronic collected soil samples from the area around the TCE Stripper. The sampling results were provided to DEQ. DEQ and Wacker Siltronic agreed to a cleanup plan that included the removal of surface soils from an area immediately around the TCE Stripper and from a second area between the Reverse Osmosis/Deionized Water (RO/DI) Storage Tanks and sidewalks. Between January 14 and 20, 1985 Wacker Siltronic removed 113 cubic yards of soil and then resampled the spill area. Following several months of discussion between DEQ and Wacker Siltronic regarding the completeness of the soil removal action, Wacker Siltronic decided to remove an additional 15 cubic yards of soil on April 10, 1985. The soils from both removal actions were taken to the hazardous waste landfill in Arlington, Oregon. Soil sampling results indicated that TCE concentrations



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were less than 1 mg/kg. Because both TCE spills occurred in essentially the same location, the cleanup action addressed both spills.

Based on these results, DEQ issued a letter to Wacker Siltronic on April 16, 1985 which stated that "... all residue of the TCE spill which occurred at your facility ...has been removed to below background levels (less than one part per million)." In its letter, DEQ approved filling the soil excavations, construction of a spill containment area around the stripper, and Wacker Siltronic's cleanup work.

As of 1988, Wacker Siltronic stopped using TCE at the facility.

### *1987 Organic Wastewater Overflow*

On June 25, 1987, a mixture of weak detergents and surfactants from the organic wastewater system overflowed onto a gravel yard and the main roadway when a wastewater line plugged. The overflow entered a stormwater catch basin and then discharged into the Willamette River through the combined effluent outfall located at the far northwest corner of the property. Wacker Siltronic estimated that the organic wastewater (OWW) flow was 3 to 5 gallons per minute and the pH was neutral (i.e., between 6 and 9). Wacker Siltronic estimates that the total discharge was 2,000 gallons.

Wacker Siltronic collected a soil sample near the catch basin. The soil sample was analyzed for pH, flash point, total metals, cyanide, sulfide, PCBs, phenol, and solvents. An EP Toxicity analysis was also performed on the soil sample. This suite of analyses was selected for purposes of profiling the soil for waste management purposes, in anticipation of the need for soil removal, not because the organic wastewater would have contained these constituents.

Six metals were detected in the soil sample: barium at 71.8 mg/kg, chromium at 9.37 mg/kg, copper at 16.3 mg/kg, lead at 41.9 mg/kg, nickel at 9.61 mg/kg, and zinc at 53.3 mg/kg[2]. No cyanide, sulfide, PCBs, phenol, or solvents were detected.

The only metal detected in the EP Toxicity analysis was barium at 0.276 mg/L.

No cleanup was conducted given the few constituents that were detected and low concentrations of the constituents that were detected.

### *1988 Pentachlorophenol Detection in Wastewater Discharge*

According to DEQ's *Strategy Recommendation*, on January 11, 1988, pentachlorophenol (PCP) was detected in one of Wacker Siltronic's wastewater effluent samples at 0.2 mg/L.

Bridgewater Group reviewed Wacker Siltronic's NPDES Monitoring Reports and related correspondence for 1988. On January 27, 1988 DEQ requested

[2] These metal concentrations are below DEQ's residential and industrial maximum allowable soil concentrations in Appendix 1, Oregon Soil Cleanup Table in OAR 340-122.



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that Wacker Siltronic sample for PCP in its combined effluent discharge based on the detection of PCP during its annual analysis of toxic organic (TTO) compounds in accordance with permit requirements. On January 29, 1988 Wacker Siltronic collected two samples: RO/DI water and combined effluent. No PCP was detected in the RO/DI water sample at a detection limit of 0.002 mg/L. PCP was detected in the combined effluent sample at a concentration of 0.004 mg/L. Wacker Siltronic sampled the combined effluent for PCP in February, March, and April, and did not detect PCP at a detection limit of 0.005 mg/L. According to a May 5, 1998 letter, DEQ agreed that Wacker Siltronic could discontinue sampling after April.

### *1990 BTEX Discovery*

In June of 1990, Wacker Siltronic installed two geotechnical borings in an area of a proposed manufacturing plant expansion (known as Fab 2). Benzene, toluene, ethylbenzene, and xylenes (BTEX) were found in soil samples collected from the two borings.

In October of 1990, Walker Siltronic retained CH2M HILL to assess the possibility that one or both of the Olympic Pipeline pipelines was the source of BTEX. As was discussed above, an earlier leak had occurred from one of the pipelines in 1979.

CH2M HILL conducted a groundwater and soil gas investigation along a 600-foot length of the utility corridor that contains the pipelines (see Figure 15). BTEX and total petroleum hydrocarbons (TPH) were found at a number of the sampling locations with the highest concentrations detected in groundwater at GW-11 and GW-7. These sampling locations were immediately adjacent to the utility corridor. BTEX and TPH concentrations generally decreased with distance away from the utility corridor, but were found at elevated concentrations (i.e., TPH at 12,040 ug/L and benzene at 5,920 ug/L in groundwater) in the proposed construction area. No free product was found, but a black, viscous substance that CH2M HILL presumed to be coal-tar-derived waste was found in several of the sampling locations. CH2M HILL concluded that the most likely source of the BTEX detected in groundwater was a gasoline leak (CH2M HILL, 1990).

In October, Wacker Siltronic reported the potential leak to Olympic Pipeline and DEQ. Several months later, Olympic Pipeline responded by retaining a contractor to excavate and expose the pipelines. No gasoline smell or leaks were observed. Olympic Pipeline subsequently pressurized the pipelines to 250 pounds per square inch (psi) for eight hours. Although Olympic Pipeline found that the pipelines held the pressurization, they concluded that the test was not conclusive. Olympic Pipeline agreed to pressurize the lines again to substantiate whether there was a leak.

Pressure testing of 2,500-foot sections of both pipelines at 790 psi was conducted February 27, 1991. Olympic Pipeline concluded that neither of the pipelines leaked, but that one of the pipelines ruptured during the test. Olympic Pipeline agreed to replace both pipelines.

In March of 1991, Olympic Pipeline capped the old pipelines in-place. New pipelines were connected and pressure tested at 1,100 psi.



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In 1995, Wacker Siltronic obtained a Petroleum Contaminated Soil Treatment Permit (#PCSLA-NWR-95-004) from DEQ to treat onsite soils excavated from the Fab 2 Building construction site. The permit allowed Wacker Siltronic to treat the soils using thermal treatment and to transport the soils to St. Johns Landfill if TPH as gasoline concentrations were at or below 40 mg/kg and TPH as waste oil, heating oil and heavy oil were at or below 100 mg/kg. In accordance with the DEQ-approved soil management plan, Wacker Siltronic staff determined whether soils were contaminated based on odor and visual staining. When contaminated soils were encountered, the soils were placed into drop boxes and sampled for waste management purposes in accordance with the soil management plan. Wacker Siltronic excavated and treated 5,491 tons of soil in accordance with a DEQ-approved soil management plan. All of the treated soils that were transported to St. Johns Landfill met the treatment requirements in the permit (Wacker Siltronic, 1995a and 1995b). The portion of the property used for soil treatment was cleaned, sampled, and closed in accordance with permit requirements (Wacker Siltronic, 1995b).

### *1991 Weak Acid Storage Tank Leak*

On September 11, 1991 a weak acid storage tank leaked when a vaive sheared off. Approximately, 4,000 gallons of weak acid was released to the ground. According to DEQ's Release Report and Evaluation Form for this leak (OERS #91-062), the release consisted of spent, deionized rinsewater. Wacker Siltronic blocked all storm drains to prevent the leak from leaving the wastewater treatment area. The pH of the weak acid at the time of the leak is unknown; the pH of the weak acid varies. According to Wacker Siltronic environmental staff, approximately, 1,000 gallons of the weak acid were recovered. The remainder would have likely neutralized within the soil column and not mobilized any significant quantities of metals. DEQ concluded that the release was not a hazardous waste, did not exceed a reportable quantity, and that no NPDES effluent limits were exceeded. DEQ further concluded that the release required no further investigation, removal, remedial action, or long-term environmental or institutional controls.

### *1997 Caustic Rinse Water Release*

On April 28, 1997, a release of caustic rinse water from an ion-enchange regeneration unit occurred when a flange on the discharge side of a pump failed and allowed rinse water to spray outside a containment area. The area covered by the release was unpaved. The rinse water release wetted the soil and pooled in some locations, but did not runoff from the immediate area. Wacker Siltronic neutralized the spilled rinse water and then cleaned up the spill with a vacuum truck. The recovered rinse water was treated on site in the wastewater treatment plant. The failed equipment was repaired and placed back into service.

Wacker Siltronic calculated that between 36 and 55 pounds of caustic were released, which according to Wacker Siltronic was below the reportable quantity for caustic.

Soil samples were collected to determine if soil cleanup was necessary. Five samples, four from the spill area and one from a control area, were collected



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and analyzed for pH in accordance with EPA SW-846 Method 9045. The sample results for the spill area ranged from 7.4 to 11.3. The pH in the control sample was 7.6.

Based on these results, Wacker Siltronic removed soil surrounding the locations with the highest pH. Soil was excavated to a depth of approximately 6 inches and additional soil samples were collected. The pH of these soil samples was the same as the control sample +/- 0.5 pH unit.

The excavated soils were sent to USA Waste Services, Inc. for disposal under a special waste permit. The soil excavations were backfilled with new gravel.

### *1998 Release During Dredging*

During the summer of 1998, Wacker Siltronic implemented a river bank stabilization project to repair damage caused by the February 1996 flood. The project included the placement of 5,415 cubic yards of Class 500 rock rip rap above ordinary high water (OHW) and 2,300 cubic yards of Class 1000 rock rip rap below OHW along 2,500 feet of the Willamette River shoreline.

An oil sheen was observed on July 29, 1998 when silt was being dredged to be used as backfill behind the rip rap. Figure 15 shows the approximate location where the silt was dredged. Wacker Siltronic notified the Coast Guard. The Coast Guard visually inspected the area and stated that it was under control. No followup was required by the Coast Guard. Wacker Siltronic also notified DEQ and EPA. DEQ stated that the oil sheen was not due to a spill, rather it was due to an existing problem. EPA stated that no followup was required.

Wacker Siltronic instructed the dredging contractor, Advanced American Diving, to place the dredged sediments on the bank and then transfer them into eight, 20-yard, lined drop boxes. The sediments were sampled and profiled for waste management purposes. Approximately, 115 tons of contaminated material, as opposed to the 75.72 tons stated in DEQ's *Strategy Recommendation*, was sent to Arlington for disposal. The sediments were found to contain total petroleum hydrocarbons. The laboratory quantified TPH concentrations falling within the following three hydrocarbon ranges: gasoline at 7.49 to 69 mg/kg, diesel at 399 to 5,810 mg/kg, and heavy oil at 293 to 2,970 mg/kg. According to Philip Neuremburg of North Creek Analytical, the laboratory that performed the TPH analyses, the chromatograms for the samples are consistent with coal tar or creosote standards, not gasoline or diesel standards. TCLP metals, pesticides, VOCs, SVOCs, and herbicides tests were run on a composite sediment sample. Barium was the only metal detected in the TCLP test at a concentration of 0.562 mg/L. No pesticides, VOCs, SVOCs, or herbicides were detected in the TCLP tests.

Bridgewater Group reviewed Wacker Siltronic's spill records and historic petroleum use. As will be discussed in the next section, Wacker Siltronic's past or current operations could not have lead to the contamination found during the 1998 bank stabilization project.



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# DISCUSSION OF CONSTITUENTS DETECTED IN NEAR SHORE SEDIMENTS RELATIVE TO OPERATIONS AT WACKER SILTRONIC

## Introduction

According to DEQ's *Strategy Recommendation*, a number of constituents were detected in seven sediment samples collected proximate to the Wacker Siltronic property above the apparent Portland Harbor sediment baseline maximum values. Figure 16 shows the location of the sediment samples collected adjacent to the property. DEQ's *Strategy Recommendation* asserts that past or current operations conducted by Wacker Siltronic led to the observed exceedances of the apparent harbor baseline maximum sediment concentrations. These exceedances are summarized in Table 1.

This section presents Bridgewater Group's analysis and conclusions regarding the observed sediment quality adjacent to the Wacker Siltronic site. A key outcome of Bridgewater Group's analysis is that there is no link between the constituents detected in Willamette River sediments and past or current operations conducted by Walker Siltronic.

## Metals

According to DEQ's *Strategy Recommendation*, the following metals are present in sediment samples above the harbor baseline values: beryllium, cobalt, iron, manganese, selenium, silver, titanium, vanadium, and zinc. As DEQ states in its *Strategy Recommendation*, the majority of these constituents exceed harbor baseline by less than 20 percent.

The presence of these metals at concentrations above the harbor baseline values is not due to past or present operations conducted by Wacker Siltronic. Silicon wafer production involves a high purity process that is essentially metal-free. Virtually all of Wacker Siltronic's manufacturing processes are metal-free, even the process piping and tanks.

The only metal used in the process is chrome, which is used to test for defects during wafer production. As was discussed in the previous section, Wacker Siltronic is permitted to discharge up to 1 pound per day, on average, of total chromium, but typically only discharges 0.02 to 0.09 pounds per day of total chromium. As DEQ states in its *Strategy Recommendation*, chromium levels in sediments at the Wacker Siltronic facility do not exceed the harbor baseline values.



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DEQ's *Strategy Recommendation* suggests that Wacker Siltronic's facility is a potential source of antimony to Willamette River sediments. Antimony is used during the crystal growing process. It is placed in a furnace and heated along with silicon. Dust emissions from the furnace are captured by a filter collector system. The filtered dusts are managed as a solid waste. No water or scrubbing technology is used in the filter system. Therefore, it is unlikely that antimony would be present in any water-related discharges from the facility.

**While the DEQ Strategy *Recommendation* is correct with respect to Wacker Siltronic's use of chromium and antimony, it is not correct about the Company's use of mercury. Mercury is not used in the process and, therefore, the downstream presence of mercury in sediments at concentrations above harbor baseline values is not associated with Wacker Siltronic's past or current operations.** The only uses of mercury at the facility are in measurement systems, fluorescent lights, and electrical switches. Mercury used in the measurement systems is vacuumed into containers and sent to a mercury refiner for reclamation. Mercury contained in lights and switches is managed as a universal waste and sent offsite.

There are two potential explanations for the presence of certain metals in sediments above harbor baseline values. The first is that sediments transported into the Portland Harbor contain metals at concentrations equal to and greater than those found at the Wacker Siltronic site. Table 2 lists metal concentrations measured by the USGS on suspended sediments at the Willamette River gaging station at Portland (i.e., at the Morrison Bridge). Most of the metals concentrations detected in sediment samples collected adjacent to the Wacker Siltronic site are within the range, and are generally near the lower end of the range, of metals concentrations measured by the USGS.

Second, as was discussed above, the property was filled between 1966 and 1973 with 1,500,000 cubic yards of rock quarry overburden and dredged materials. The overburden was obtained from a rock quarry located across Highway 30 from the property. The overburden itself and any excess rock from the quarry may be a source of some of the metals detected in sediments. For instance, the iron detected in sediments may, in part, have come from the historic rock quarrying operation that drained into an unnamed creek that flowed across the northwest portion of the property before it was filled. Wacker Siltronic has observed iron staining at the City of Portland's stormwater outfall located just downstream of the Railroad Bridge and at the Fab 2 stormwater outfall located near the center of the property. Also, as Figure 11 illustrates, water that drained from the property during filling with dredged materials was turbid. Drainage from the dredge fill operation could have carried fine-grained sediments containing metals back into the river.



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# Semivolatile Organics and PAHs

## Low Molecular Weight Polynuclear Aromatic Hydrocarbons (LPAH)

DEQ has grouped six low molecular weight PAHs into a single chemical category for the purposes of presenting harbor sediment information. LPAH constituents include naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, and anthracene.

DEQ reported that all seven sediment samples collected off the Wacker Siltronic site exceeded the apparent harbor baseline maximum LPAH concentration of 700 µg/kg with surface sediment sample SD070 containing over 100 times the LPAH compared to the harbor baseline value. Downriver sediment samples SD065 and SD067 also exceeded the harbor baseline values by a factor of 237 and 161, respectively.

### *Chemical Background*

While some individual uses and markets for the individual LPAH constituents exist, all LPAH, HPAH, and other semivolatile organic constituents detected in the sediments are major constituents in coal tar; coal tar creosote; and No. 2 diesel and fuel oil (see Table 3). See also discussion under HPAHs, 2-methylnapthalene, and carbazole.

In coal tar, naphthalene is present at an average concentration of 10 percent (100,000 ppm), phenanthrene (5%), fluorene (2%), and anthracene (1.8%). Similar concentrations are observed in coal tar creosote.

Coal tar creosote is the most common form of creosote. It is a thick, oily liquid that is typically amber to black in color, and is a distillation product of coal tar. Coal tar creosote is the most widely used wood preservative in the United States, and is used as a wood preservative and water-proofing agent for railroad ties, telephone poles, marine pilings, and fence posts. It is also a restricted-use pesticide, and is used as an animal and bird repellant, insecticide, animal dip, fungicide, and a pharmaceutical agent for the treatment of psoriasis. About 300 chemicals have been identified in coal tar creosote.

Coal tar and coal tar pitch are the by-products of the high-temperature treatment of coal to make coke or natural gas. They are usually thick, black or dark brown liquids or semi-solids with a naphthalene-like odor. Coal tar products are ingredients in medicines used to treat skin diseases such as psoriasis; they are also used as animal and bird repellants, insecticides, animal dips, and fungicides. Coal tar creosotes, coal tar, and coal tar pitch are similar in composition.

LPAHs are also components (by percent composition) in a number of distillate fuels. Data reported in Composition of Petroleum Mixtures (Total Petroleum Hydrocarbon Criteria Working Group, May 1998) for No. 2 diesel and fuel oil indicates that naphthalene averages 0.22% (2,200



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ppm), acenaphthylene (0.006%), acenaphthene (0.018%), fluorene (0.019%), phenanthrene (0.079%), and anthracene (0.0058%).

### *Assessment of Relevance to Wacker Siltronic Site*

DEQ's *Strategy Recommendation* states that "...Historical operations associated with oil gasification processes at the former GASCO site have resulted in petroleum related contamination at the Wacker site." As was discussed earlier, direct discharges may have occurred to the river prior to when the GASCO plant was expanded in the 1930s. After that, tar was discharged into four settling ponds, three of which were on what is now Wacker Siltronic property. Two of the three sediment sample locations (i.e., SD068 and SD069) where elevated LPAH concentrations were detected are located just offshore of where the ponds were located (see Figure 7). One of the three sediment sampling locations (i.e., SD068) where elevated LPAH concentrations were detected is located about where the former Shell Oil Company dock was located (see Figure 2).

DEQ's *Strategy Recommendation* also states that there may have been spills or waste disposal activities associated with the former Western Transportation facility. Historical releases from this facility may explain the LPAH concentrations detected at sampling locations SD072A (at depth) and SD075 (see Figure 2).

LPAH releases from these historic sources to Willamette River sediments would have decreased in the 1950s when Western Transportation and Shell Oil Company stopped its operations, and in the 1960s when the settling ponds were filled. Subsequent releases would have been further reduced or eliminated in the 1970s when the property was filled with rock quarry overburden and dredged material.

After plant construction in 1978, Wacker Siltronic would not have contributed any additional LPAHs to the Willamette River sediments from its operations. The only source of LPAHs associated with Wacker Siltronic's past and present operations is diesel fuel stored for use in three emergency generators. All of the diesel fuel is stored in aboveground storage tanks that are integral to each generator. Wacker Siltronic has no record of any spill or leak of diesel fuel from its emergency generators.

Therefore, it is Bridgewater Group's conclusion that no link exists between the LPAHs detected in the Willamette River sediments and past or current operations conducted by Wacker Siltronic.

## High Molecular Weight Polynuclear Aromatic Hydrocarbons (HPAH)

DEQ has grouped 10 high molecular weight PAHs into a single chemical category for the purposes of presenting harbor sediment information. HPAH constituents include fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenz(a,h)anthracene, and benzo(g,h,i)perylene.



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DEQ reported that all seven sediment samples collected off the Wacker Siltronic site exceeded the apparent harbor baseline maximum HPAH concentration of 2,400 µg/kg with subsurface sediment sample SD068 contained over 37 times the HPAH compared to the harbor baseline value. Downriver sediment samples SD065 and SD067 also exceeded the apparent harbor baseline values by a factor of 112 and 80, respectively.

### *Chemical Background*

While some individual uses and markets for the individual HPAH constituents exist, all HPAH, LPAH, and other semivolatile organic constituents detected in the sediments are major constituents in coal tar, coal tar creosote, and No. 2 diesel and fuel oil (see Table 3). See also discussion under LPAHs, 2-methylnapthalene, and carbazole.

### *Assessment of Relevance to Wacker Siltronic Site*

The highest HPAH concentrations were detected at sampling locations SD068, SD069, and SD070. As was discussed above, two the these sampling locations are located just offshore of where the settling ponds were located and one of the sample locations is close to the former Shell Oil Company dock.

The next highest HPAH concentrations were detected at sample locations SD072A (at depth) and SD075. DEQ's *Strategy Recommendation* also states that there may have been spills or waste disposal activities associated with the former Western Transportation facility. Historical photographs (see Figures 2 and 3) show that the docks associated with this facility were close to these sampling locations.

HPAH releases from these historic sources to Willamette River sediments would have decreased in the 1950s when Western Transportation and Shell Oil stopped operations, and in the 1960s when the settling ponds were filled. Subsequent releases would have been further reduced or eliminated in the 1970s when the property was filled with rock quarry overburden and dredged material.

After plant construction in 1978, Wacker Siltronic would not have contributed any additional HPAHs to the Willamette River sediments from its operations. The only source of HPAHs associated with Wacker Siltronic's past and present operations is diesel fuel stored for use in three emergency generators. All of the diesel fuel is stored in aboveground storage tanks that are integral to each generator. Wacker Siltronic has no record of any spill or leak of diesel fuel from its emergency generators.

Therefore, it is Bridgewater Group's conclusion that no link exists between the HPAHs detected in the Willamette River sediments and past or current operations conducted by Wacker Siltronic.



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## 2-Methylnaphthalene

2-methylnapthalene was detected above the harbor baseline value of 150 ug/kg in six of the seven sediment samples collected off the Wacker Siltronic facility. The highest 2-methylnaphthalene concentrations were found in the same samples that had elevated LPAH and HPAH concentrations.

### *Chemical Background*

2-methylnapthalene is present in coal tar at up to 1.4 percent (14,000 ppm). During distillation of coal tar, it comprises one of the distillate fractions of coal tar creosote. It is reported in material safety data sheets (MSDS) to be present at 1 to 5 percent (10,000-50,000 ppm) in commercial coal tar creosote treating solutions.

Data reported in *Composition of Petroleum Mixtures* indicates that 2-methylnapthalene is also present in No. 2 diesel fuel at an average concentration of 0.89 percent (8,900 ppm).

### *Assessment of Relevance to Wacker Siltronic Site*

When viewed in the context of the total spectrum of PAHs and semivolatile organics detected in the sediments adjacent to the Wacker Siltronic facility, it appears that 2-methylnapthalene came from the same source(s) as the LPAHs and HPAHs detected in river sediments.

As was discussed above, the only material used by Wacker Siltronic that could be a source of 1-methylnaphthalene is diesel fuel. Wacker Siltronic has no records of any releases or spills of diesel fuel from its emergency generators.

Therefore, it is Bridgewater Group's conclusion that no link exists between the 2-methylnapthalene detected in the Willamette River sediments and past or current operations conducted by Wacker Siltronic.

## Carbazole

Carbazole was detected in six of the seven sediment samples above the harbor baseline of 100 ug/kg. The concentrations reported for all of the surface sediment samples were *estimated* concentrations ranging from 170 to 3,400 ug/kg. The highest carbazole concentrations were detected in the three most downstream sampling locations (i.e., SD068, SD069, and SD070).

### *Chemical Background*

Carbazole is a heterocyclic aromatic compound containing a dibenzopyrrole system, and is produced during coal gasification. Coal tar produced at high temperature contains an average of 1.5% (15,000 ppm) carbazole. Several thousand tons of carbazole are produced each year



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from coal tar and crude oil. It is used widely in synthesis of dyes, pharmaceuticals, and plastics.

Carbazole is also one of the 300+ constituents that comprise creosote used for wood preservation. Depending on the fractionation of the creosote solution, carbazole can comprise up to 1 percent of coal tar creosote.

Data reported in *Composition of Petroleum Mixtures* indicates that mono and di-methyl carbazoles are present in no. 2 diesel fuels at less than 0.001 percent by weight.

### *Assessment of Relevance to Wacker Siltronic Site*

Viewed in the context of the total spectrum of PAHs and semivolatile organics detected in the sediments adjacent to the Wacker Siltronic facility, it appears that carbazole came from the same source(s) as the LPAHs and HPAHs.

Therefore, it is Bridgewater Group's conclusion that no link exists between the carbazole detected in the Willamette River sediments to past or current operations conducted by Wacker Siltronic.

## Dibenzofuran

Dibenzofuran was detected in all seven sediment samples off the Wacker Siltronic site above the harbor baseline value of 100 ug/kg, as well as downriver sediment samples SD065 and SD067. The dibenzofuran concentrations are correlated with total LPAHs and HPAHs, indicating that the dibenzofuran in sediments originated from the same source(s).

### *Chemical Background*

Dibenzofuran (diphenylene oxide) is present in coal tar at up to 1 percent (10,000 ppm). During coal tar distillation, it is recovered in the distillate fractions that comprise coal tar creosote. The only reported use of dibenzofuran as a separate distillate is in insecticides.

Data reported in *Composition of Petroleum Mixtures* does not indicate that dibenzofuran is a constituent in No. 2 diesel fuel.

### *Assessment of Relevance to Wacker Siltronic Site*

When viewed in the context of the total spectrum of PAHs and semivolatile organics detected in the sediments adjacent to the Wacker Siltronic facility, it appears that the dibenzofuran came from the same source(s) as the LPAHs and HPAHs.

Furthermore, Wacker Siltronic has never applied insecticides at the facility.



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Therefore, it is Bridgewater Group's conclusion that no link exists between the dibenzofuran detected in the Willamette River sediments to past or current operations conducted by Wacker Siltronic.

## Pentachlorophenol

Pentachlorophenol (PCP) was detected at concentrations of 7.1 and 6.4 ug/kg at sampling locations SD075 and SD077, respectively. These concentrations are less than the harbor baseline value of < 97ug/kg, as listed in Table F-1, Data Evaluation Summary Table, in the Portland Harbor Sediment Management Plan (PHSMP). The baseline value in the PHSMP is inconsistent with the "detect" value listed in Table 1 of DEQ's Strategy Recommendation.

PCP was also detected in upstream sediment samples SD078, SD080, SD081, and SD088 at concentrations ranging from 4.6 to 11 ug/kg. PCP was detected along with other chlorinated herbicides in a suite of samples collected between River Mile 7 and 7.5.

### *Chemical Background*

PCP is one of the most heavily used pesticides in the U.S. It is used primarily as an industrial wood preservative. It is registered for use by the U.S. Environmental Protection Agency (EPA) as an insecticide (termicide), fungicide, herbicides, molluscide, algicide, disinfectant, and as an ingredient in antifouling paint.

Until the mid-1980s, PCP (sodium pentachlorophenate) was also used in sawmills as a mildew/sap-stain control agent, and as an ingredient in consumer wood-preserving formulations, herbicides, and pesticides.

### *Assessment of Relevance to Wacker Siltronic Site*

Bridgewater Group reviewed Wacker Siltronic's chemical use files and found no records indicating that pentachlorophenol was ever used at the site.

As was discussed earlier, PCP was detected twice in 1988 in Wacker Siltronic's combined effluent. Subsequent sampling of the combined effluent over a period of three months did not detect any PCP. The combined effluent outfall is located at the far northwest corner of the property. Given the location of this outfall and the short period of time over which PCP was present in the discharge, it is unlikely that the combined effluent is the source of the PCP detected in sediments.

Soil samples collected by CH2M HILL in 1985 in the portion of the property where a polysilicon plant was proposed for construction found PCP to be present at 35- to 35.6-feet deep at MW-4, 10- to 11.5-feet deep at MW5, and 15- to 16.5-feet deep at MW-6 (CH2M HILL, 1985a). The detection of PCP at these depths is indicative of a historic source prior to the filling of the property. It does not appear that the PCP present in subsurface soils at these locations is the source of PCP in the Willamette River sediments, however, given that PCP was not detected,



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at a detection limit of 0.001 mg/L, in groundwater samples collected from the monitoring wells in 1985.

Therefore, it is Bridgewater Group's conclusion that no link exists between the PCP detected in Willamette River sediments and past or current operations conducted by Wacker Siltronic.

# Pesticides

2,4-D and 2,4-DB were detected above the harbor baseline value of <3.3 ug/kg at SD075 and SD077, the two sediment samples located at the upstream end of the property. The same two pesticides were detected at similar or higher concentrations in the two sediment samples collected upstream of the property: SD078 and SD080. DEQ's *Strategy Recommendation* states that " ....Due to the presence of the former presticide and herbicide manufacturer, Rhone-Poulenc upstream of the Wacker site, it does not appear that the presence of 2,4-D and 2,4-DB in Willamette River sediments is related to the Wacker site."

## *Chemical Background*

There are many forms or derivatives of 2,4-D including esters, amines, and salts. 2,4-D, a chlorinated phenoxy compound, functions as a systemic herbicide and is used to control many types of broadleaf weeds. It is used in cultivated agriculture, in pasture and rangeland applications, forest management, home, garden, and to control aquatic vegetation. It may be found in emulsion form, in aqueous solutions (salts), and as a dry compound. Commercial names for products containing 2,4-D include Aqua-Kleen, Barrage, Lawn-Keep, Malerbane, Planotox, Plantgard, Savage, Salvo, Weedone, and Weedtrine-II. The product Agent Orange, used extensively throughout Vietnam, was about 50% 2,4-D.

Traditionally, Rhone-Poulenc Ag. Co., has been a primary manufacturer of 2,4-D in the U.S.

2,4-DB is 4-(2,4-dichlorophenoxy)butyric acid. Trade names for products containing 2,4-DB include Butoxone, Butyrac, Butirex, Embutone, Embutox, and Venceweed. 2,4-DB may also be found in formulations with other herbicides such as cyanazine, MCPA, benazolin, linuron, and mecoprop.

2,4-DB is a selective systemic herbicide in the phenoxy family. It is used for the control of many annual and perennial broad-leaved weeds in alfalfa, peanuts, soybeans, and other crops. In the plant, the compound changes to 2,4-D and inhibits growth at the tips of stems and roots.

Traditionally, Rhone-Poulenc Ag. Co., has been a primary manufacturer of 2,4-DB in the U.S.



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### *Assessment of Relevance to Wacker Siltronic Site*

Based on review of Wacker Siltronic's records, Bridgewater Group is in agreement with DEQ. The only pesticide used on a regular basis by Wacker Siltronic is Roundup™. This emergent herbicide is used for brush control. It is applied by a licensed applicator service. Therefore, there is no link between the 2,4-D and 2,4-DB present in Willamette River sediments and past or current operations conducted by Wacker Siltronic.

## Phthalates

Bis(2-ethylhexyl)phthalate was detected at one sediment sampling location (i.e., SD075) at a concentration exceeding the harbor baseline value of 390 ug/kg. Bis(2-ethylhexyl)phthalate was not detected above the harbor baseline value immediately upstream or downstream of the property.

### *Chemical Background*

Di(2-ethylhexyl) phthalate (DEHP), commonly called bis (2-ethylhexyl) phthalate, is a colorless, oily liquid with a slight odor. Patented in 1933, it is primarily used as one of several plasticizers in polyvinyl chloride (PVC) resins for fabricating flexible vinyl products. These PVC resins have been used to manufacture teething rings, pacifiers, soft squeeze toys, balls, shower curtains, raincoats, adhesives, polymeric coatings, components of paper and paperboard, defoaming agents, enclosures for food containers, animal glue, surface lubricants, lead-acid battery separators, and other products that must stay flexible for their lifetime. It is also used to manufacture vinyl gloves used for medical examinations and surgery.

As a non-plasticizer, bis(2-ethylhexyl) phthalate is used as a replacement for polychlorinated biphenyls (PCBs) in dielectric fluids for electric capacitors and transformers. It is also used as a solvent in erasable ink, an acaricide for use in orchards, an inert ingredient in pesticides, a component of cosmetic products, vacuum pump oil; and it is used to detect leaks in respirators and to test air filtration systems.

### *Assessment of Relevance to Wacker Siltronic Site*

**DEQ's *Strategy Recommendation* states that Wacker Siltronic uses dioctylphthalate as a plasticizer. This is incorrect. According to Wacker Siltronic, no phthalates are used anywhere in the manufacturing process.**

In 1985, bis(2-ethylhexyl)phthalate was detected in groundwater at two locations (i.e., MW-2 and MW-4) on the portion of the property where a polysilicon plant was proposed for construction. According to North Creek Analytical laboratory, the bis(2-ethylhexyl)phthalate concentrations that were detected are trace levels that could easily be associated with cross-contamination from field sampling equipment or from sample



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handling in the laboratory. Thus, the bis(2-ethylhexyl)phthalate reportedly detected in groundwater may not have been present. Even if it was present, it does not appear to be the source of the bis(2-ethylhexyl)phthalate detected in Willamette River sediments. The monitoring of groundwater elevations between 1986 and 1998 in this area indicates that groundwater flow is to the southeast and east, away from the Willamette River. Bis(2-ethylhexyl)phthalate was not detected in groundwater in any of the four monitoring wells (i.e., MW-3, MW-5, MW-6 and MW-7) located downgradient from MW-2 and MW-4. Thus, the extent of bis(2-ethylhexyl)phthalate in groundwater, if it was present at all, was limited and it did not migrate offsite in groundwater.

It is important to note that sediment sample SD075 is located downstream of a City of Portland storm drain that discharges just downstream of the Railroad Bridge. Bis(2-ethylhexyl)phthalate is a constituent that is commonly found in sediments adjacent to stormwater discharges. Sampling conducted in 1995 at five stormwater discharge locations in the Willamette River found bis(2-ethylhexyl)phthalate to be present at each location (Port of Portland, 1998).

It is Bridgewater Group's conclusion is that there is no link between the bis(2-ethylhexyl)phthalate detected in one sediment sample and past or current operations conducted by Wacker Siltronic.



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**Table 1**
**Constituents Reported by DEQ to Exceed Apparent**
**Portland Harbor Baseline Sediment Values**

| Analyte | Downstream | | Adjacent to Wacker Siltronic Site | | | | | | | Upstream | | Harbor Baseline Maximum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SD065 | SD067 | SD068 | SD069 | SD070 | SD072 | SD072A | SD075 | SD077 | SD078 | SD080 | |
| Metals (mg/kg) | | | | | | | | | | | | |
| Beryllium | 0.7 | 0.7 | 0.65 | 0.7 | 0.7 | 0.6 | 0.6 | ***0.9*** | 0.7 | 0.5 | 0.7 | 0.7 |
| Cobalt | 19 | 17.8 | 18.2 | ***21.3*** | ***20.3*** | 18.4 | ***24.6*** | ***23.9*** | ***21.3*** | 15.4 | 18.3 | 19.7 |
| Iron | 43,100 | 43,800 | 44,100 | ***54,200*** | ***53,000*** | ***51,900*** | ***53,900*** | ***64,500*** | ***58,600*** | 41,400 | 44,200 | 45,000 |
| Manganese | 699 | 624 | 681 | 725 | 638 | 591 | ***863*** | ***909*** | 605 | 487 | 693 | 810 |
| Selenium | 11 | ***17*** | 12 | ***17*** | ***17*** | ***16*** | 14 | ***17*** | 14 | 11 | 14 | 15 |
| Silver | 1.0 | 1.2 | 1.2 | ***1.5*** | 1.4 | 1.3 | 1.3 | ***1.7*** | ***1.6*** | 1.0 | 1.2 | 1.4 |
| Titanium | NA | NA | NA | NA | ***2,840*** | ***2,740*** | ***2,850*** | NA | ***3,200*** | NA | NA | 2075 |
| Vanadium | 107 | ***113*** | 110 | ***136*** | ***132*** | ***125*** | ***136*** | ***152*** | ***147*** | 89.1 | 106 | 112 |
| Zinc | 104 | ***150*** | ***134*** | ***144*** | 117 | 113 | ***145*** | ***120*** | ***124*** | 100 | ***131*** | 118 |
| Organics (µg/kg) | | | | | | | | | | | | |
| 2-Methylnaphthalene | ***11,000*** | ***7,600*** | ***2,700*** | ***210*** | ***530*** | 130 | ***980*** | ***180*** | ***430*** | 24 | 19U | 150 |
| Bis(2-ethylhexyl)phthalate | 200U | 200U | 150 | 76 | 94U | 210 | 260 | ***700*** | 180U | 210 | 260 | 390 |
| Cabazole | ***3,600*** | ***1,800*** | ***1,700J*** | ***3,400J*** | ***2,000EJ*** | 86J | ***660*** | ***170J*** | ***700J*** | 40J | 19U | 100 |
| Dibenzofuran | ***1600*** | ***1300*** | ***700*** | ***1,900*** | ***2,600*** | ***220*** | ***3,600*** | ***340*** | ***160*** | 20 | 19U | 100 |
| Pentachlorophenol | 480UJ | 1,000U | 98UJ | 98UJ | 94UJ | 99UJ | 530U | ***7.1*** | ***6.4*** | ***4.6*** | ***11*** | Detect |
| LPAHs | ***165,600*** | ***112,400*** | ***60,430*** | ***65,680*** | ***70,574*** | ***4,995*** | ***31,500*** | ***13,490*** | ***6,860*** | 425 | 337 | 700 |
| HPAHs | ***268,800*** | ***192,000*** | ***89,800*** | ***58,390*** | ***46,990*** | ***8,630*** | ***18,860*** | ***15,260*** | ***9,060*** | ***3,034*** | 2,134 | 2,400 |
| 2,4-D | NA | NA | NA | NA | NA | NA | NA | ***9*** | ***24*** | ***21*** | ***93*** | <3.3 |
| 2,4-DB | NA | NA | NA | NA | NA | NA | NA | ***19*** | ***13*** | ***23*** | ***130*** | <5 |
| | | | | | | | | | | | | |

Notes: Analyte concentrations shown in ***bold italics*** exceed the apparent Portland Harbor Baseline maximum value for that analyte.

J = The analyte was positively identified and detected: however, the concentration in an estimated value because the result is less than the quantitation limit or quality control criteria were not met.

It should be noted that Table 1 of DEQ's *Strategy Recommendation* did not report the "J" data qualifier. Data in the DEQ table is represented as an actual concentration, when, in fact, it is an estimated concentration.



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**Table 2**
**Comparison of Metals Reported by DEQ to Exceed Apparent Portland Harbor Baseline Sediment Concentrations with Metals Concentrations Detected on Suspended in the Portland Harbor**

| Analyte | Adjacent to Wacker Siltronic Site | | | | | | | Concentration on Suspended Sediments in the Portland Harbor[a] | Concentration on Suspended Sediments in the Portland Harbor[b] |
|---|---|---|---|---|---|---|---|---|---|
| | SD068 | SD069 | SD070 | SD072 | SD07A | SD075 | SD077 | | |
| Metals (mg/kg) | | | | | | | | | |
| Beryllium | 0.65 | 0.7 | 0.7 | 0.6 | 0.6 | ***0.9*** | 0.7 | 1.1 – 3.0 | 1.1 – 1.6 |
| Cobalt | 18.2 | ***21.3*** | ***20.3*** | 18.4 | ***24.6*** | ***23.9*** | ***21.3*** | 21 – 32 | 22 -30 |
| Iron | 44,100 | ***54,200*** | ***53,000*** | ***51,900*** | ***53,000*** | ***64,500*** | ***58,900*** | 47,000 – 66,000 | 52,000 – 66,000 |
| Manganese | 681 | 725 | 638 | 591 | ***863*** | ***909*** | 605 | 1,300 – 4,100 | 800 – 3,700 |
| Selenium | 12 | ***17*** | ***17*** | ***16*** | 14 | ***17*** | 14 | 0.1 – 0.6 | 0.1 – 0.6 |
| Silver | 1.2 | ***1.5*** | 1.4 | 1.3 | 1.3 | ***1.7*** | ***1.6*** | <0.1 - <0.5 | <0.5 – 0.9 |
| Titanium | NA | NA | ***2,840*** | ***2,740*** | ***2,850*** | NA | 3,200 | 5,100 – 7,800 | 5,800 – 8,800 |
| Vanadium | 110 | ***136*** | ***132*** | ***125*** | ***136*** | ***152*** | ***147*** | 130 - 190 | 140 – 180 |
| Zinc | ***134*** | ***144*** | 117 | 113 | ***145*** | 120 | ***124*** | 120 - 180 | 38 – 250 |

Notes: Analyte concentrations shown in ***bold italics*** exceed the apparent Portland Harbor Baseline maximum value for that analyte.

[a] Metal concentrations measured by the USGS at the Willamette River at Portland gaging station (USGS, 1995, 1996, 1998)

b Metal concentrations measured by the USGS at the Willamette River at Portland gaging station, unpublished data for 1995 through 1996 provided by Chauncey Anderson

NA = Not analyzed

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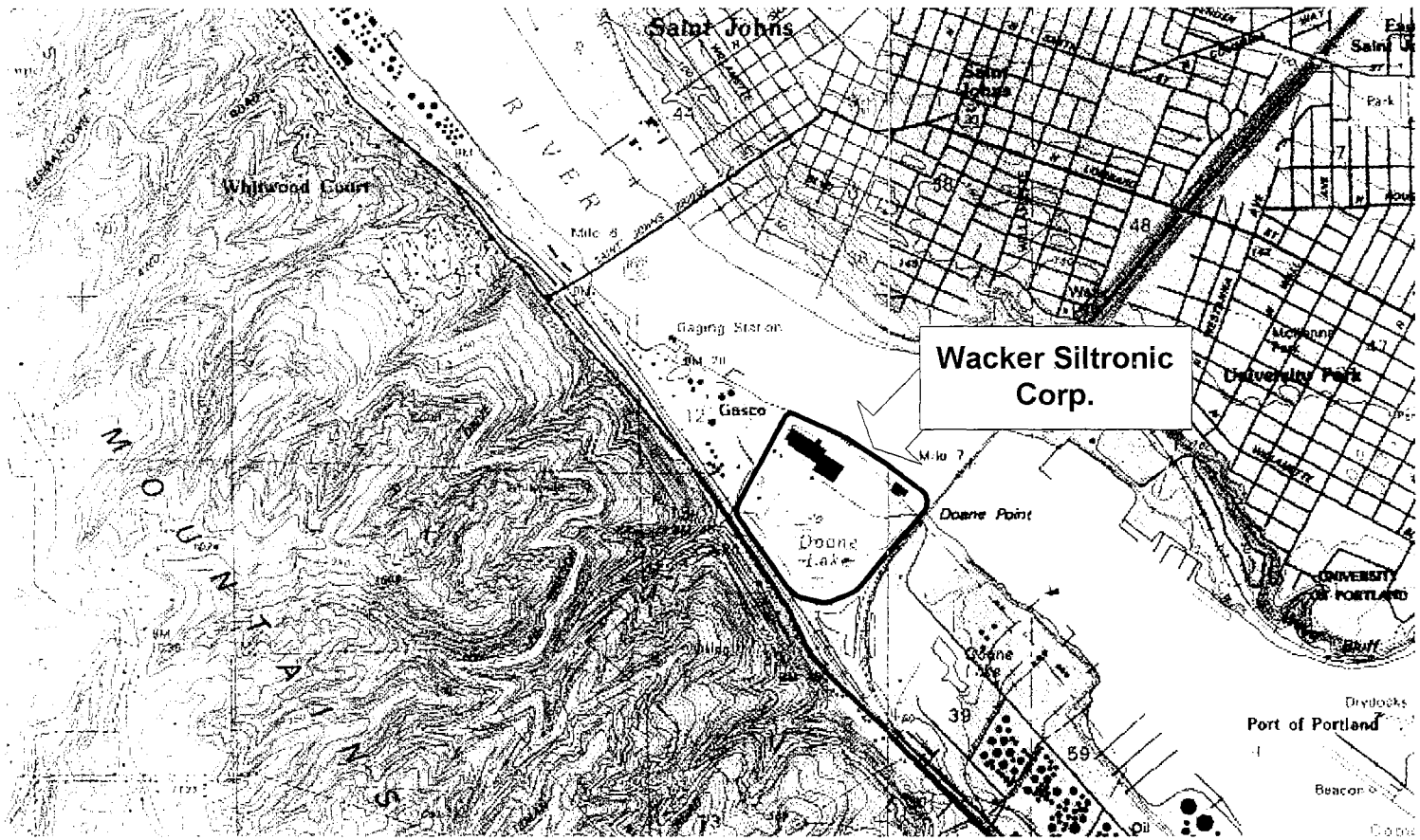
**Table 3**
**Comparison of Sediment Sample Results Collected Near the Wacker Siltronic Site to Potential Source Chemicals**

| Constituent | SD068 (%) | SD069 (%) | SD070 (%) | SD072 (%)[a] | SD072A (%) | SD075 (%) | SD077 (%) | No.2 Diesel and Fuel Oil (%)[a] | Creosote (%)[b] | Coal Tar (%)[c] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semivolatile Organics** | | | | | | | | | | |
| 2-Methylnaphthalene | 0.00027 | 0.000021 | 0.000053 | 0.000013 | 0.000098 | 0.000018 | 0.000043 | 0.68-0.89 | 1-6 | 1.4 |
| Carbazole | 0.00017 | 0.00034 | 0.00020 | 0.0000086J | 0.000066 | 0.000017J | 0.00007J | - | ✓ | 1.5 |
| Dibenzofuran | 0.000070 | 0.00019 | 0.00026 | 0.000022 | 0.00036 | 0.000034 | 0.000016 | - | ✓ | 1.0 |
| **LPAHs** | | | | | | | | | | |
| Naphthalene | 0.000079 | 0.000020 | 0.000051 | 0.000021 | 0.000020 | 0.000035 | 0.00003 | 0.026-0.22 | 1-6 | 10 |
| Acenaphthylene | 0.000074 | 0.000018 | 0.0000064 | 0.0000085 | 0.0000011U | 0.000014 | 0.000014 | 0.006 | ✓ | + |
| Acenaphthene | 0.0015D | 0.00056D | 0.0011D | 0.00015 | 0.00072 | 0.00038D | 0.00024D | 0.018 | 1-6 | 1.4 |
| Fluorene | 0.00049D | 0.00067D | 0.0011D | 0.000096 | 0.00050 | 0.00024D | 0.00014 | 0.086 | ✓ | 2.0 |
| Phenanthrene | 0.0033D | 0.0031D | 0.0040D | 0.00018D | 0.0016D | 0.00055D | 0.00022 | 0.079-0.088 | 5-13 | 5.3 |
| Anthracene | 0.00060D | 0.0022D | 0.0008D | 0.000044 | 0.00031 | 0.00013 | 0.000042 | 0.0028-0.0058 | 1-5 | 1.8 |
| **HPAHs** | | | | | | | | | | |
| Fluoranthene | 0.0020D | 0.0022D | 0.0019D | 0.00015D | 0.00072D | 0.00035D | 0.00017D | 0.0014-0.0059 | ✓ | 3.3 |
| Pyrene | 0.0026D | 0.0017D | 0.0017D | 0.00016D | 0.00066 | 0.00033D | 0.00025D | 0.0029-0.0046 | ✓ | 2.1 |
| Benzo(a)anthracene | 0.00063D | 0.00048D | 0.00029D | 0.00007 | 0.00011 | 0.00015 | 0.000074 | 0.000045-0.000096 | ✓ | + |
| Chrysene | 0.00086D | 0.00063D | 0.00032D | 0.00011 | 0.00015 | 0.00017D | 0.000092 | 0.000045-0.00014 | ✓ | 2.0 |
| Benzo(b)fluoranthene | 0.00039D | 0.00019D | 0.00011D | 0.00008 | 0.000046 | 0.00011 | 0.000070 | 0.000031 | ✓ | + |
| Benzo(k)fluoranthene | 0.00054D | 0.00014 | 0.00012 | 0.000063 | 0.000069 | 0.00011 | 0.000067 | Reported with Benzo(b)fluoranthene | ✓ | + |
| Benzo(a)pyrene | 0.00080D | 0.00024D | 0.00014 | 0.000098 | 0.000066 | 0.00013 | 0.000089 | 0.000021-0.00022 | ✓ | + |
| Indeno(1,2,3-cd)pyrene | 0.00042D | 0.00011 | 0.000052 | 0.000056 | 0.000031 | 0.000073 | 0.000038 | 0.000016 | ✓ | + |
| Dibenz(a,h)anthracene | 0.00015 | 0.000039 | 0.000021 | 0.000016 | 0.000011U | 0.000022 | 0.000014 | - | ✓ | + |
| Benzo(g,h,I)perylene | 0.00059DJ | 0.00011 | 0.000046 | 0.000060 | 0.000034 | 0.000081 | 0.000042J | 0.0000057-0.000012 | ✓ | + |

[a]From *Composition of Petroleum Mixtures – Volume 2*, Total Petroleum Hydrocarbon Criteria Working Group, May 1998.

[b]From material safety data sheet (MSDS), Reilly Industries, P2 Creosote Solution, July 1995. ✓ denotes that constituent was listed on MSDS, but percent composition was not listed.

[c]Chemical Process Industries, R. Norris Shreve, McGraw-Hill Book Company, 3rd Ed, 1967. + denotes that constituent is present but percent composition not listed.




Source: USGS, Linnton and Portland Quadrangles (1990)

N

Approximate Scale: 1" = 2325'

**Figure 1**
Location Map
Wacker Siltronic Corp.

BRIDGEWATER GROUP, INC.

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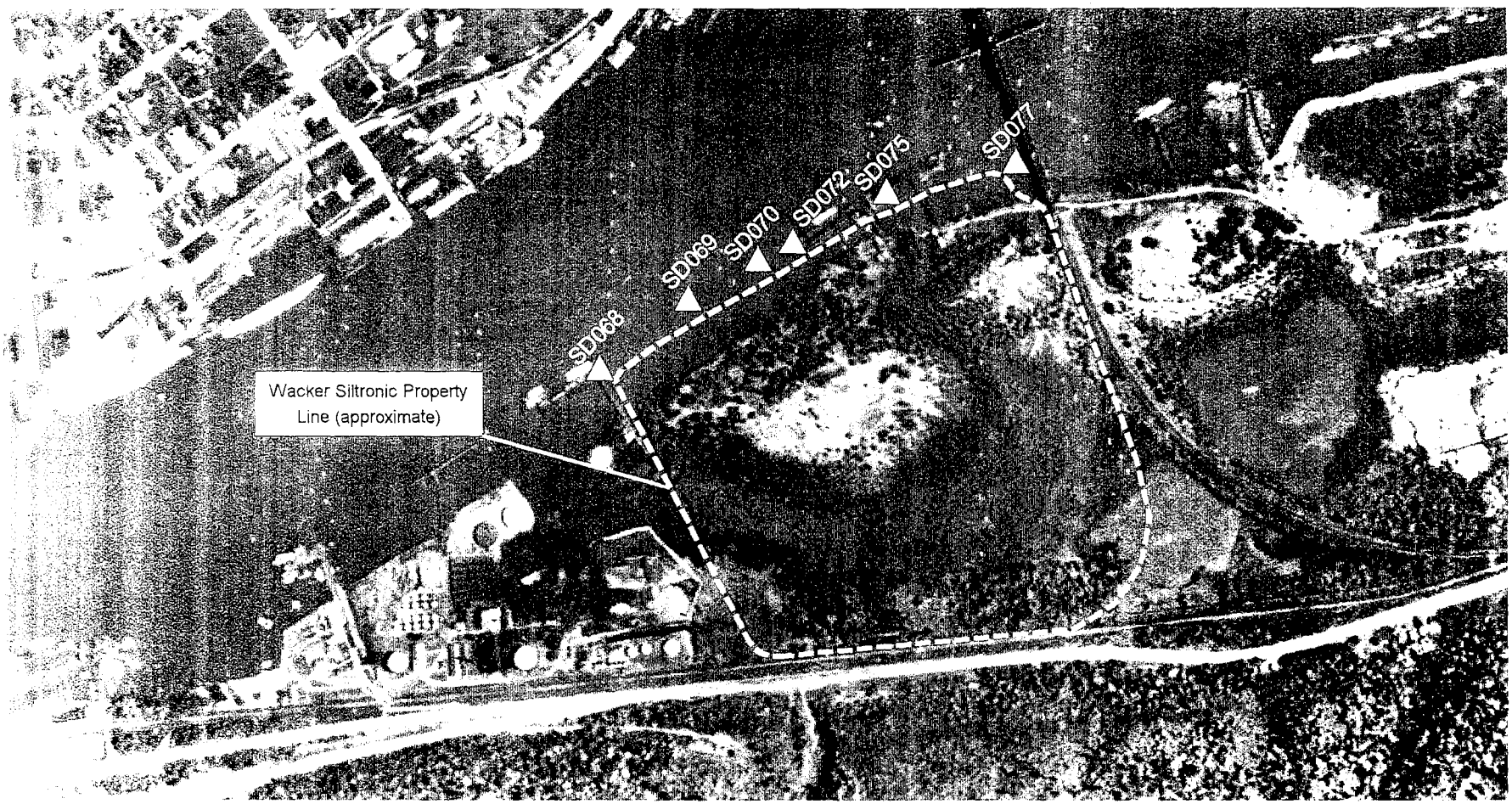


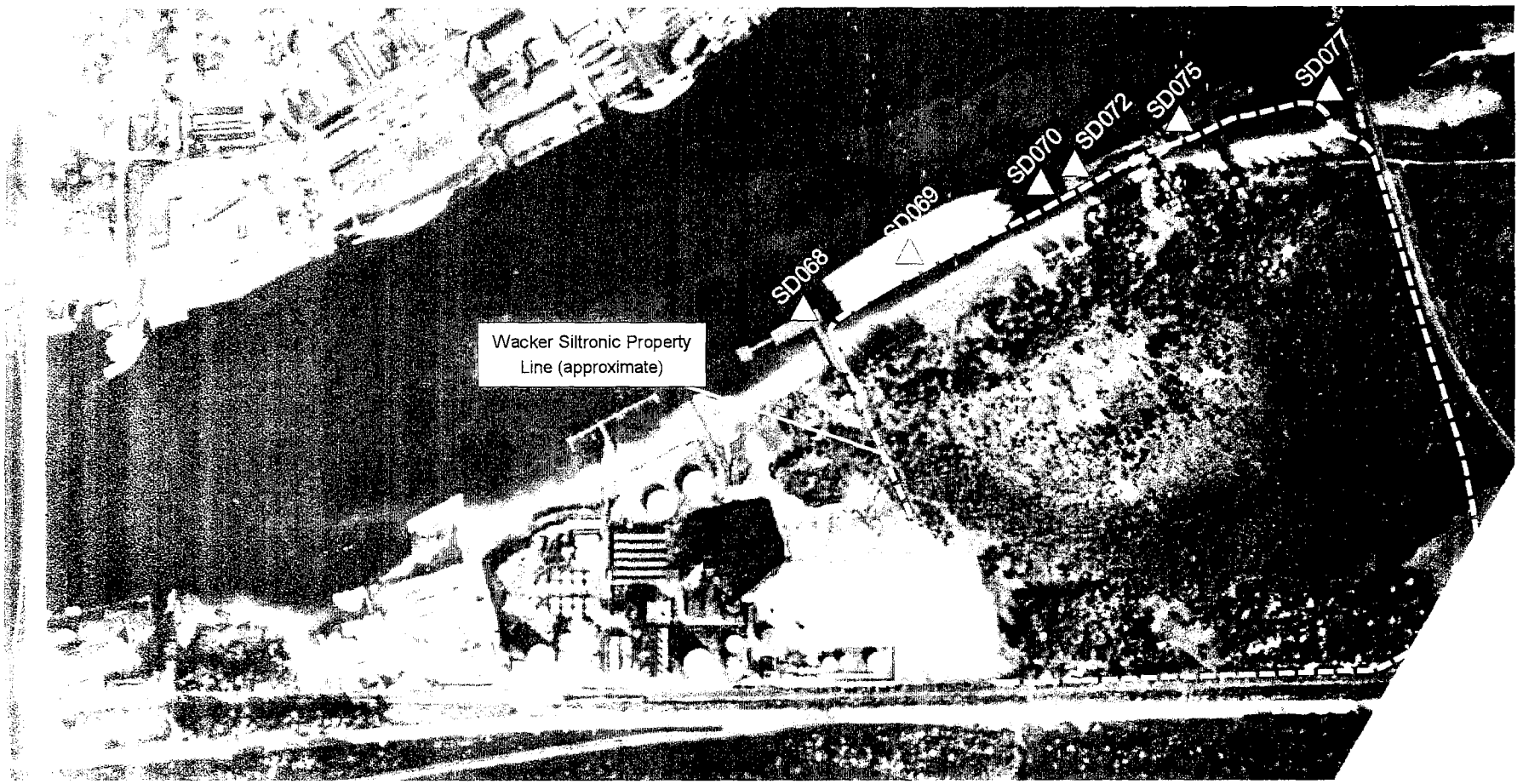

Approximate Location of EPA Sediment Sample Station (SDxxx)

Approximate Scale: 1 inch = 600 feet

**Figure 2**
Historical Aerial Photograph
May 1936

BRIDGEWATER GROUP, INC.

SCOEPA0010847




Approximate Location of EPA
Sediment Sample Station (SDxxx)

Approximate Scale: 1 inch = 600 feet

**Figure 3**
Historical Aerial Photograph
October 1940

BRIDGEWATER GROUP, INC.

SCOEPA0010848

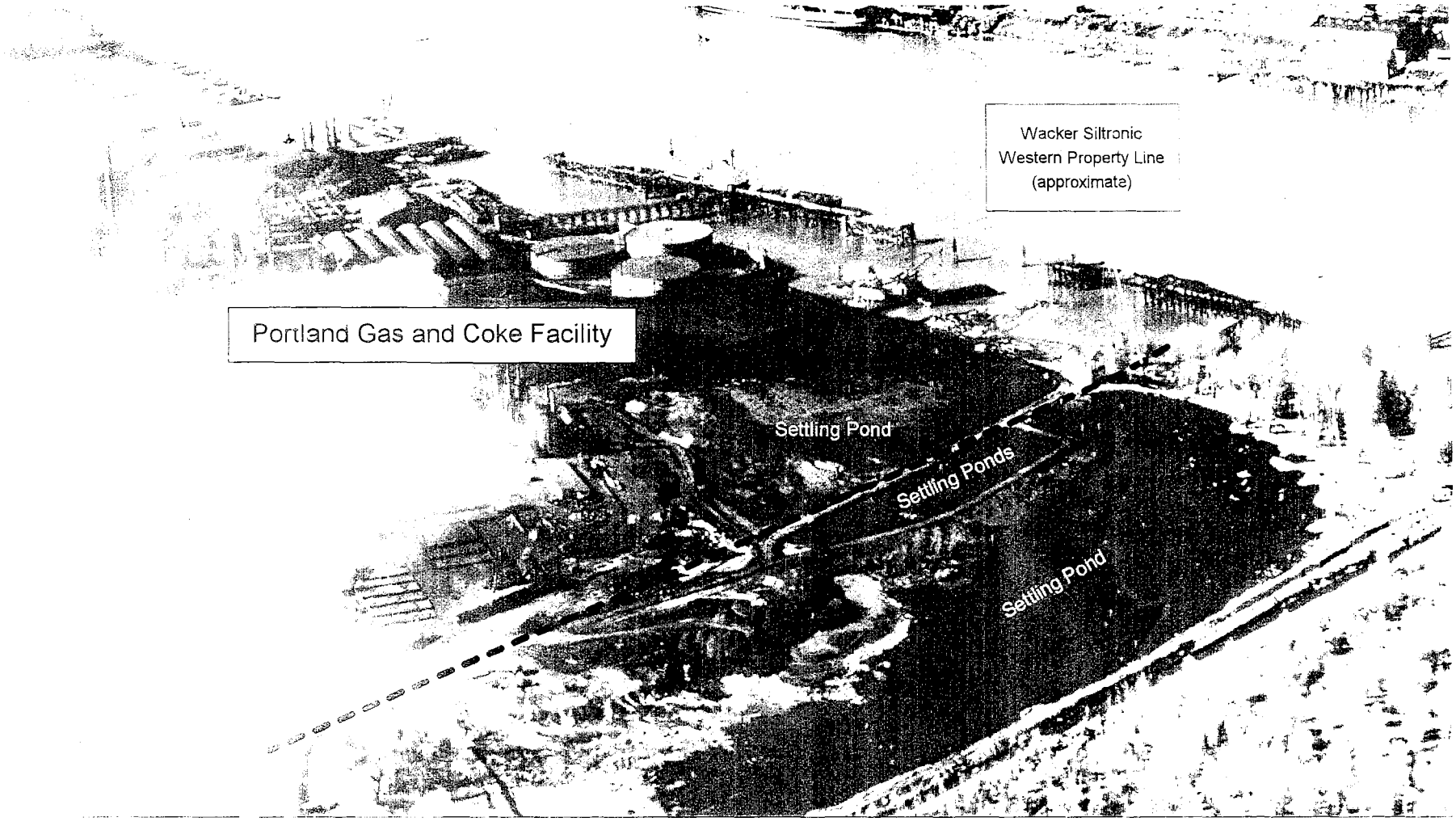



**Figure 4**
Historical Aerial Photograph
April 1952

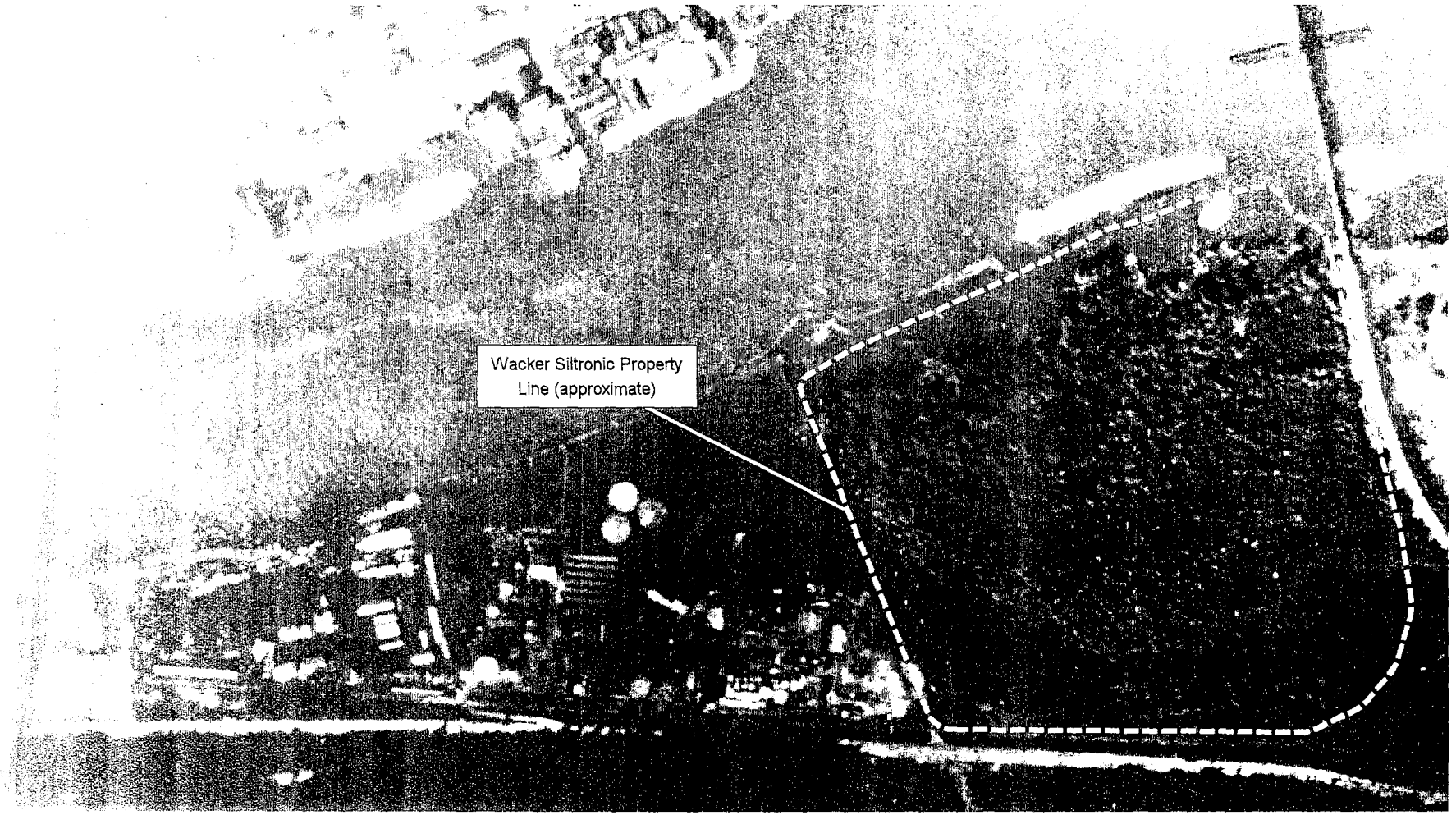
BRIDGEWATER GROUP, INC.

SCOEPA00010849

**Figure 5**
Historical Aerial Photograph
March 1955

BRIDGEWATER GROUP, INC.

SCOEPA00010850



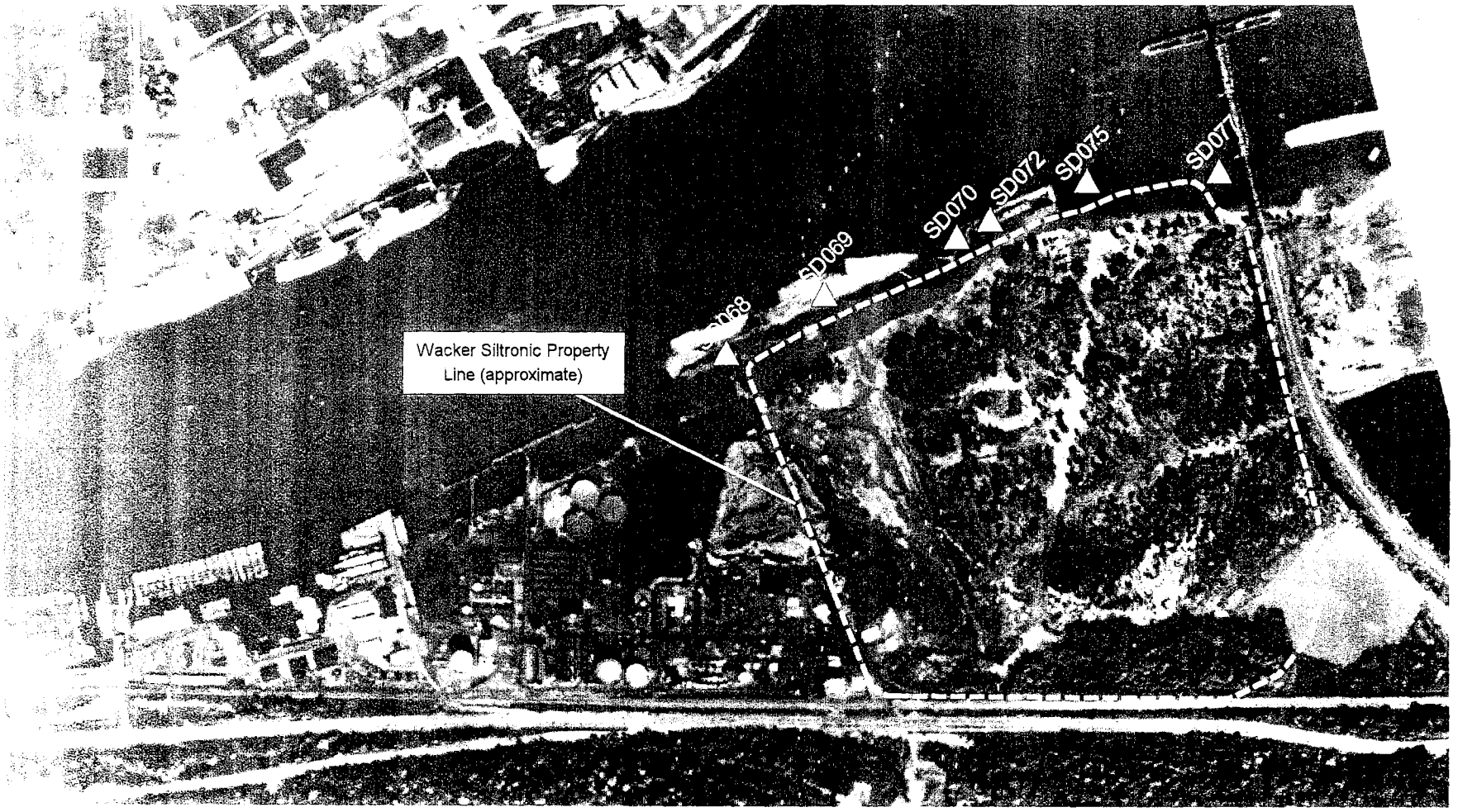

N

Approximate Scale: 1 inch = 600 feet

**Figure 6**
Historical Aerial Photograph
June 1948 Flood

BRIDGEWATER GROUP, INC.

SCOEPA00010851




Approximate Location of EPA
Sediment Sample Station (SDxxx)

Approximate Scale: 1 inch = 600 feet

**Figure 7**
Historical Aerial Photograph
May 1957

BRIDGEWATER GROUP, INC.

SCOEPA00010852

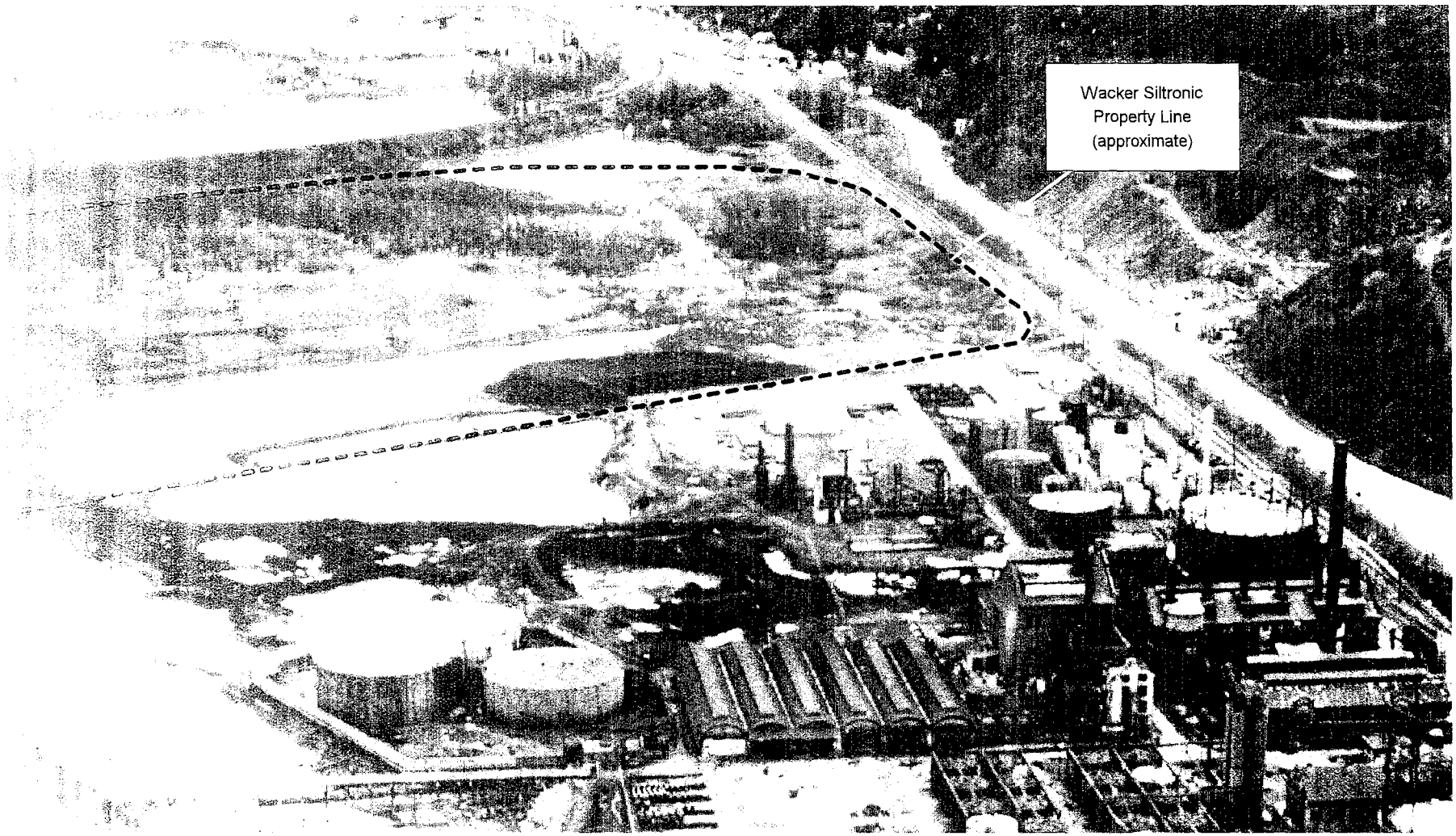
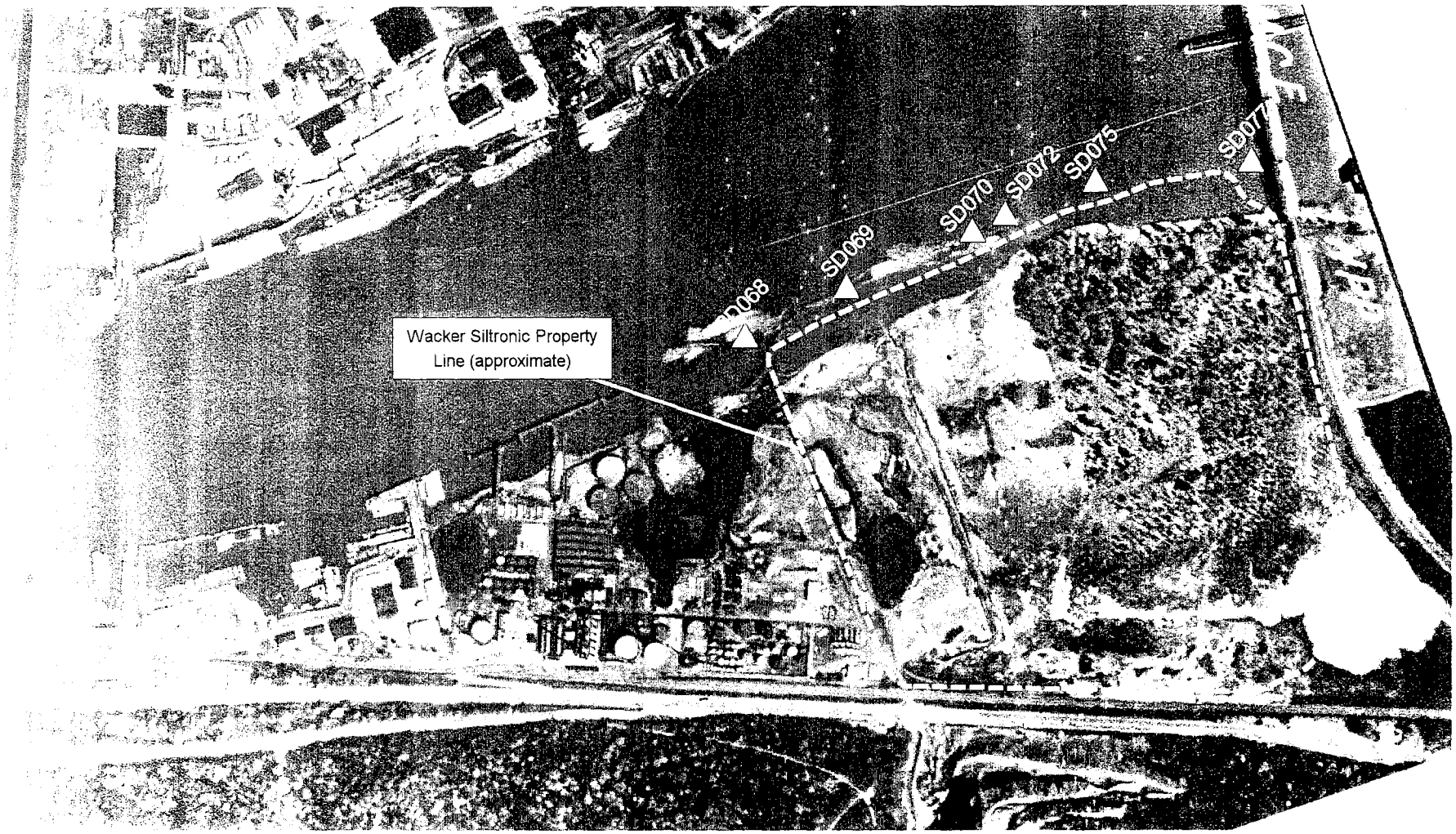



**Figure 8**
Historical Aerial Photograph
March 1961

BRIDGEWATER GROUP, INC.

SCOEPA00010853



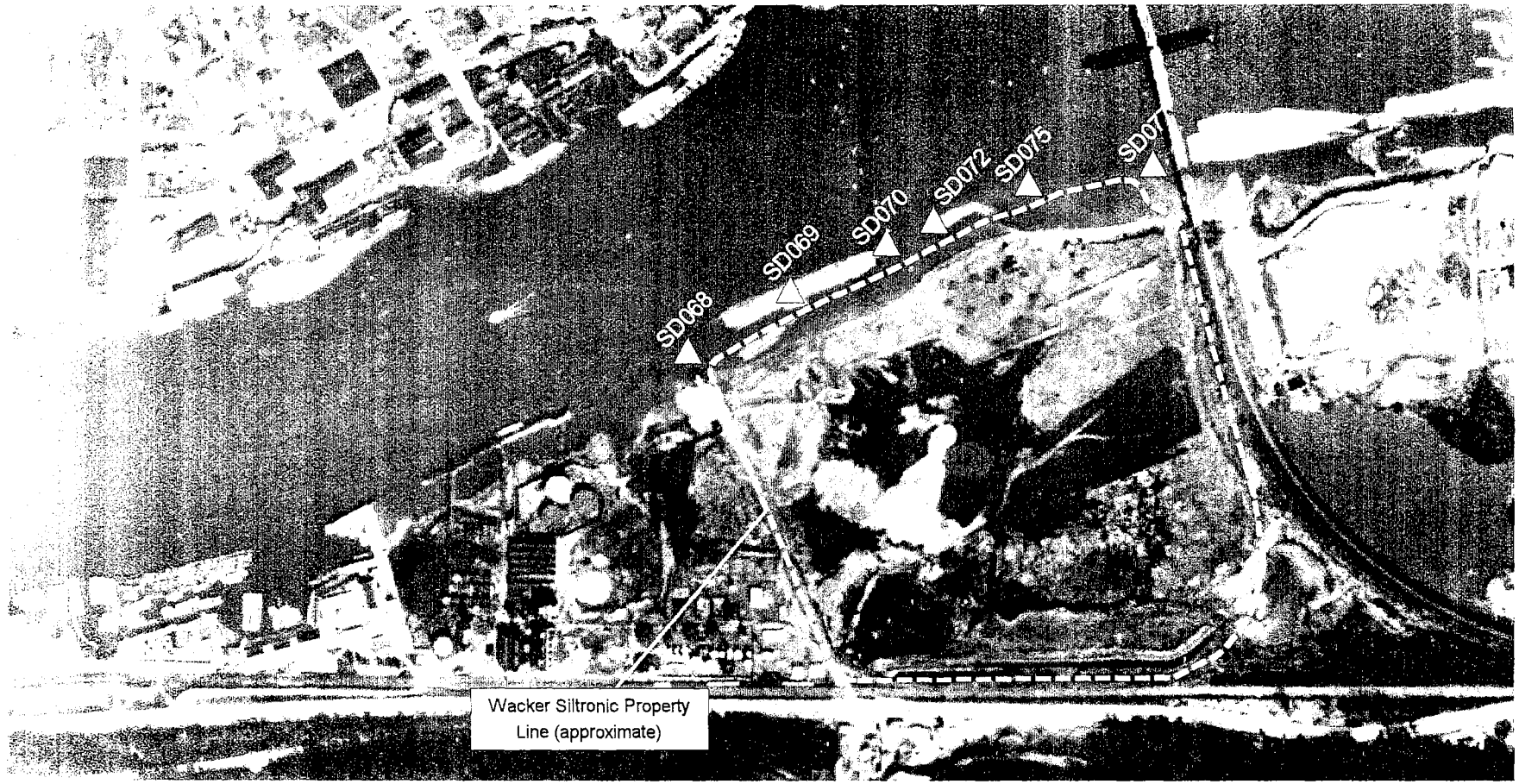

Approximate Location of EPA Sediment Sample Station (SDxxx)

Approximate Scale: 1 inch = 600 feet

**Figure 9**
Historical Aerial Photograph
April 1961

BRIDGEWATER GROUP, INC.

SCOEPA00010854




Approximate Location of EPA
Sediment Sample Station (SDxxx)

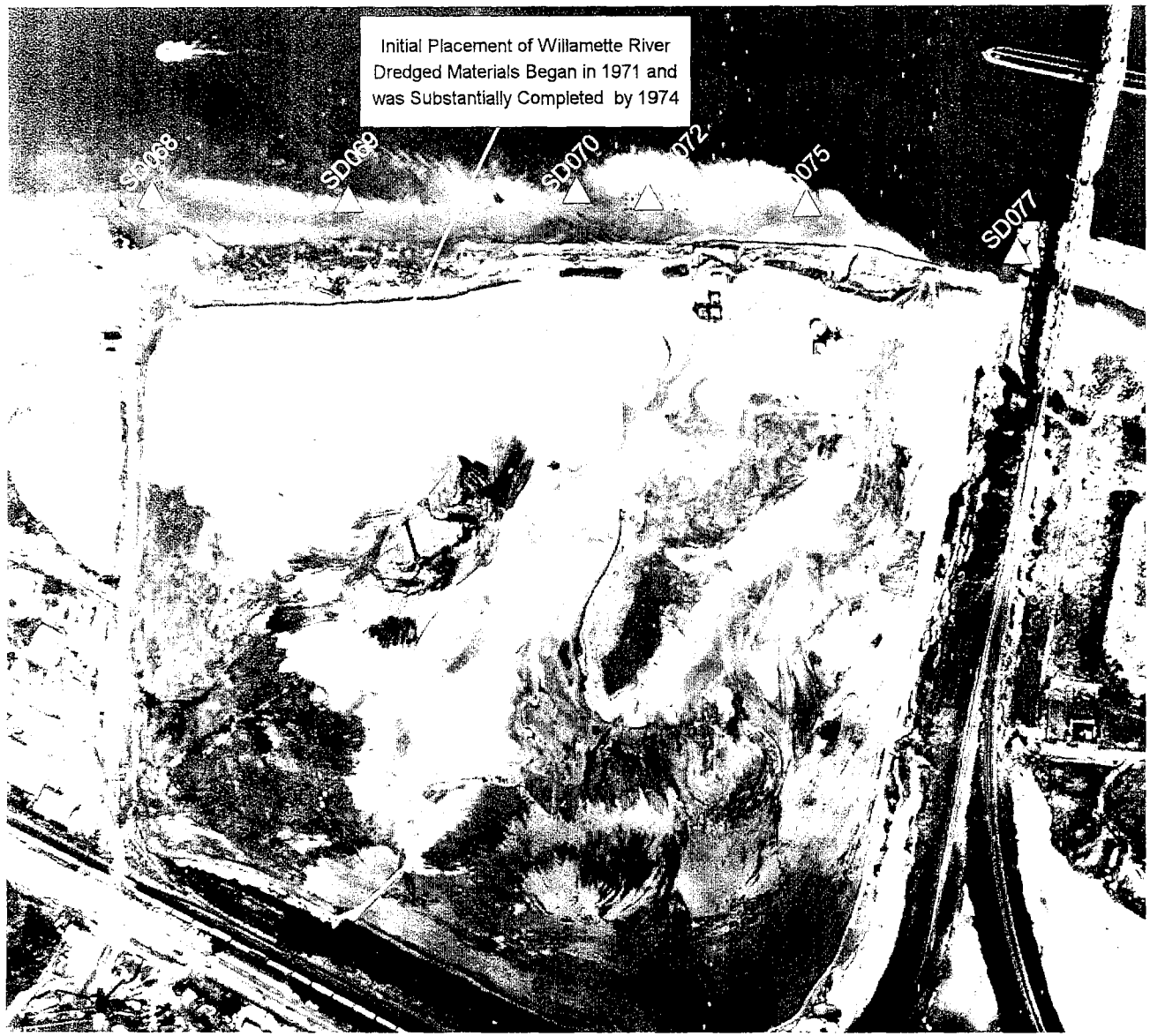
N

Approximate Scale: 1 inch = 600 feet

**Figure 10**
Historical Aerial Photograph
April 1967

BRIDGEWATER GROUP, INC.

SCOEPA00010855




Approximate Location of EPA Sediment Sample Station (SDxxx)

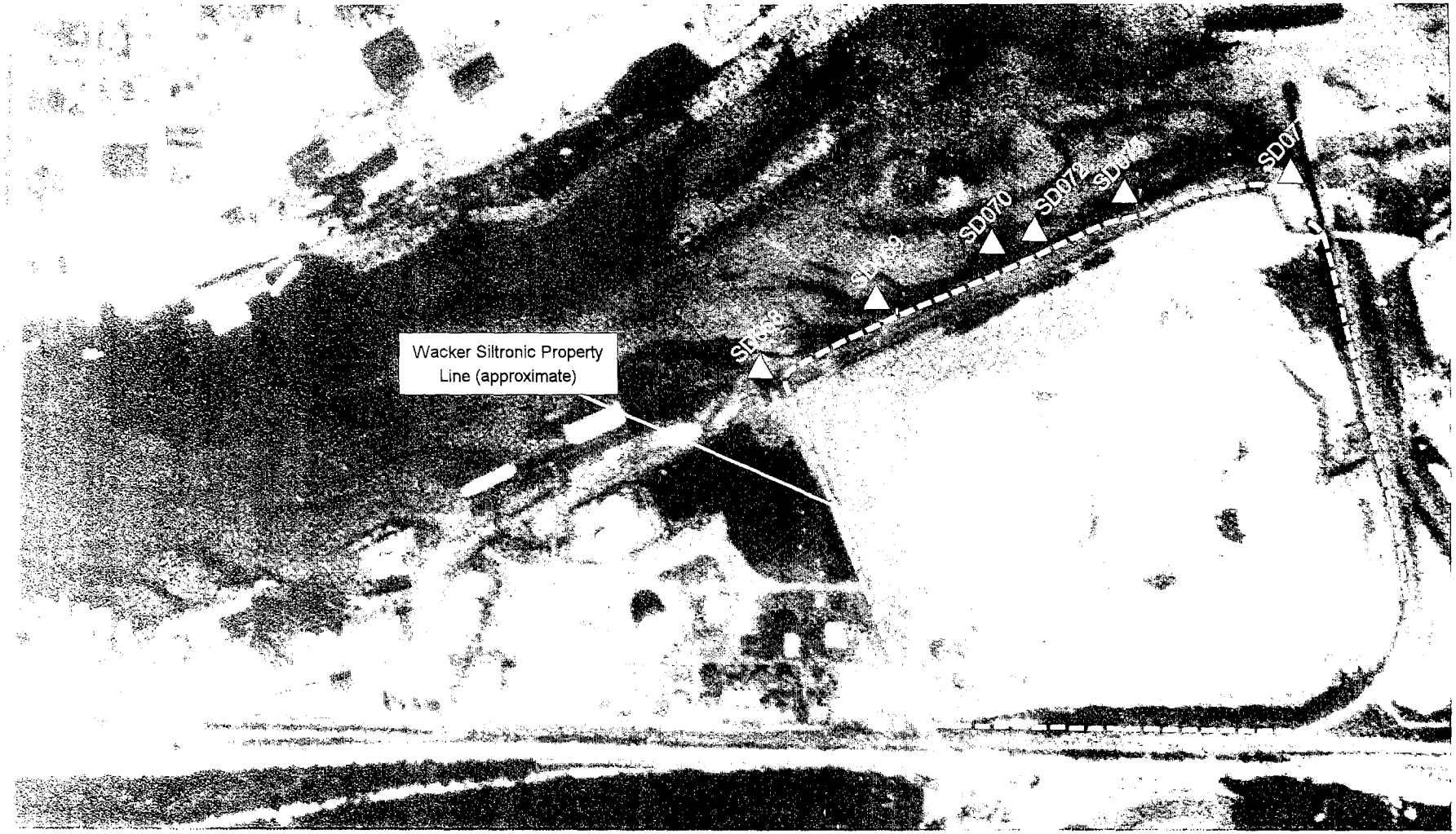
N

Approximate Scale: 1 inch = 420 feet

**Figure 11**
Historical Aerial Photograph
1971

BRIDGEWATER GROUP, INC.

SCOEPA00010856



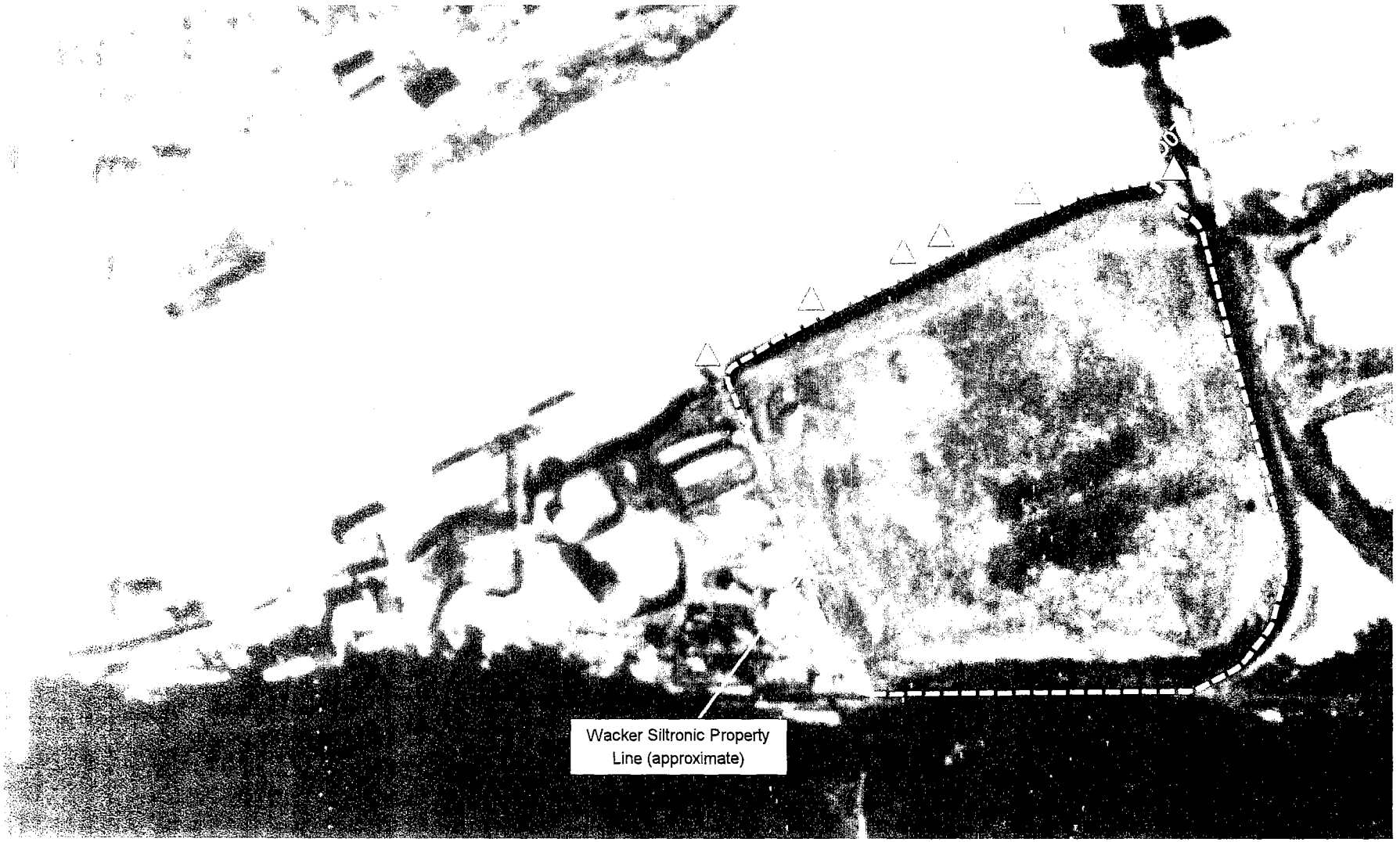

Approximate Location of EPA Sediment Sample Station (SDxxx)

Approximate Scale: 1 inch = 600 feet

**Figure 12**
Historical Aerial Photograph
August 1973

BRIDGEWATER GROUP, INC.

SCOEPA00010857




Approximate Location of EPA
Sediment Sample Station (SDxxx)

Approximate Scale: 1 inch = 600 feet

**Figure 13**
Historical Aerial Photograph
December 1977

BRIDGEWATER GROUP, INC.

SCOEPA00010858

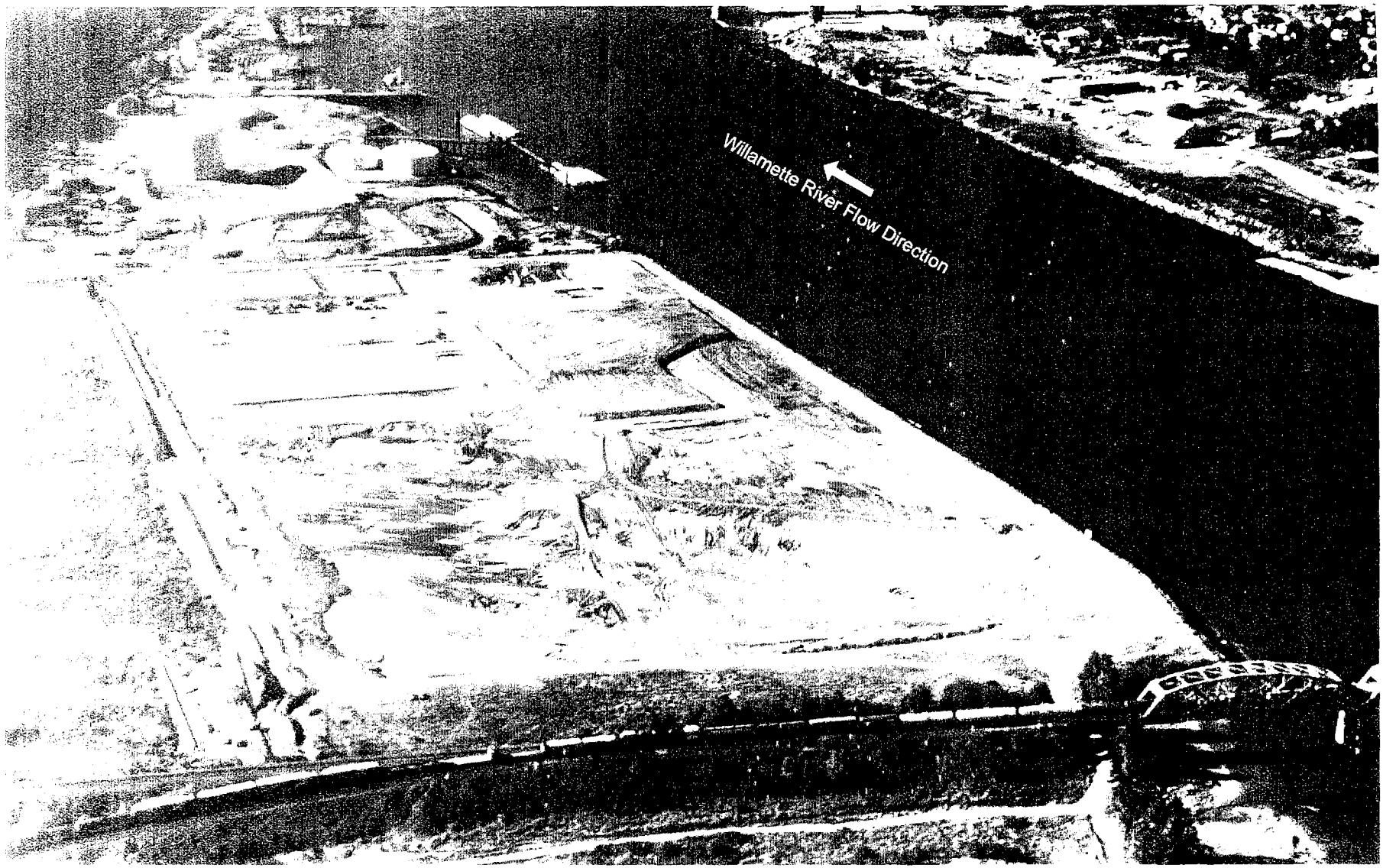



**Figure 14**
Historical Aerial Photograph
October 1978

BRIDGEWATER GROUP, INC.

SCOEPA00010859

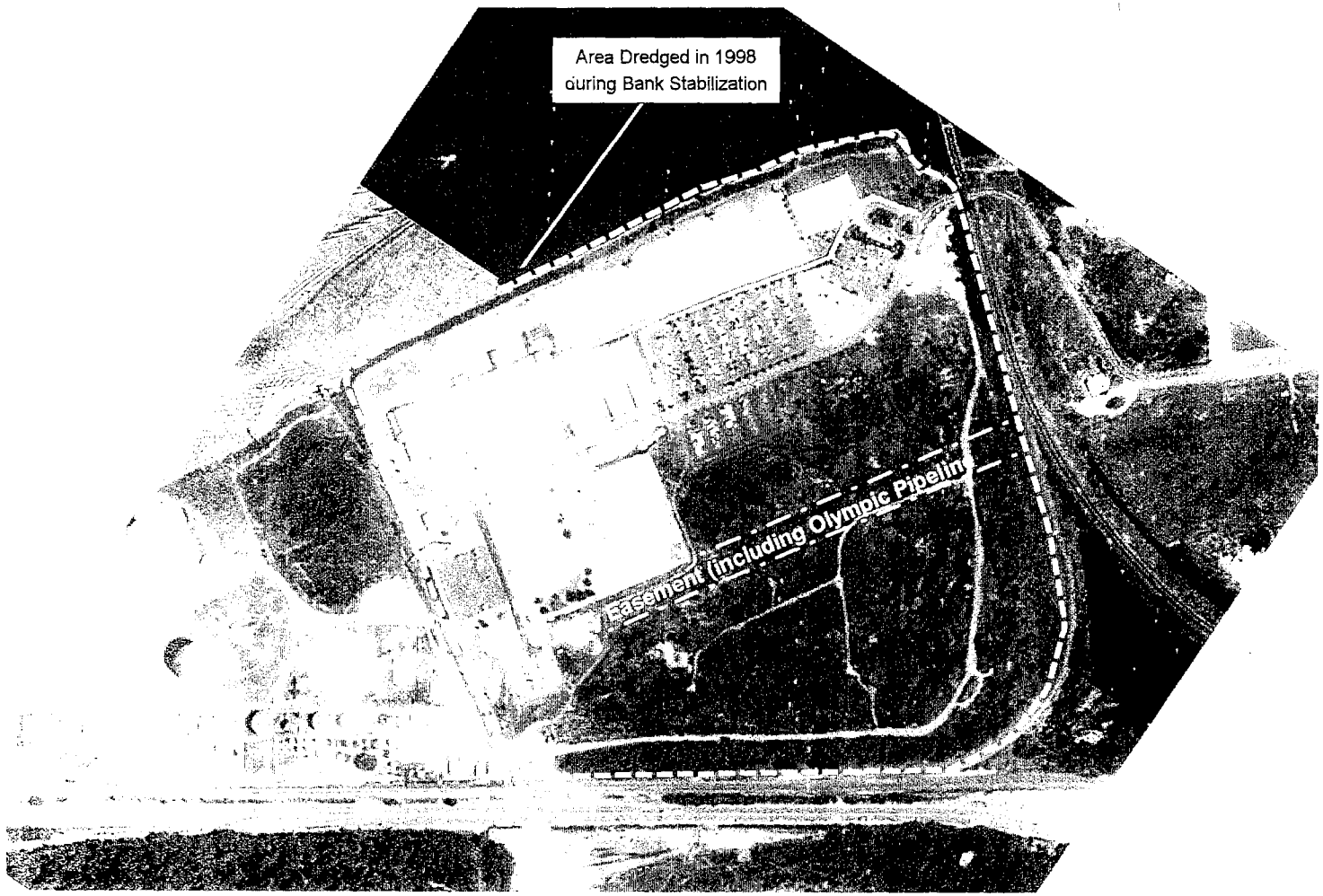
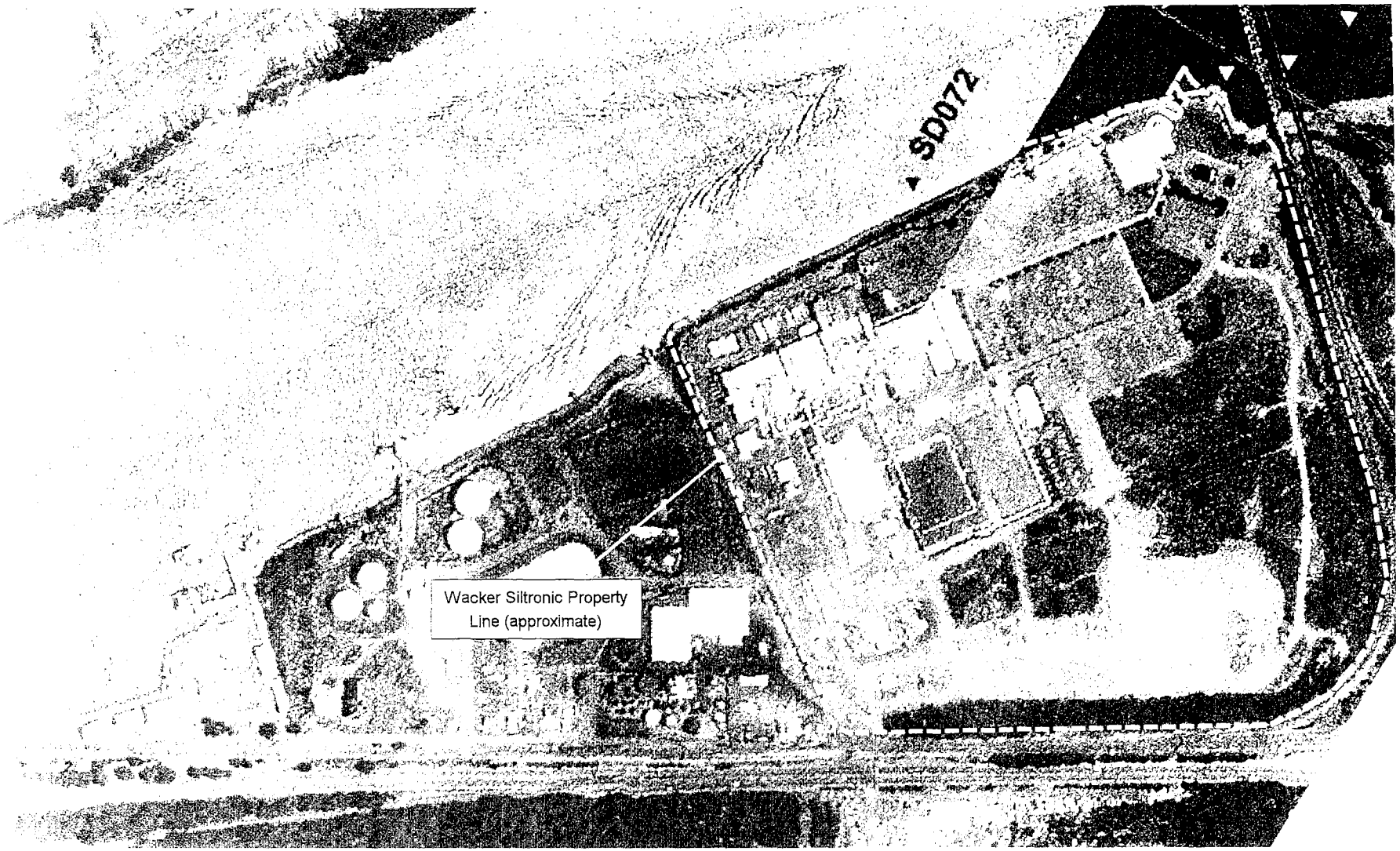



**Figure 15**
Historical Aerial Photo
September 1993

BRIDGEWATER GROUP, INC.

SCOEPA00010860




Source: EPA, May 1998

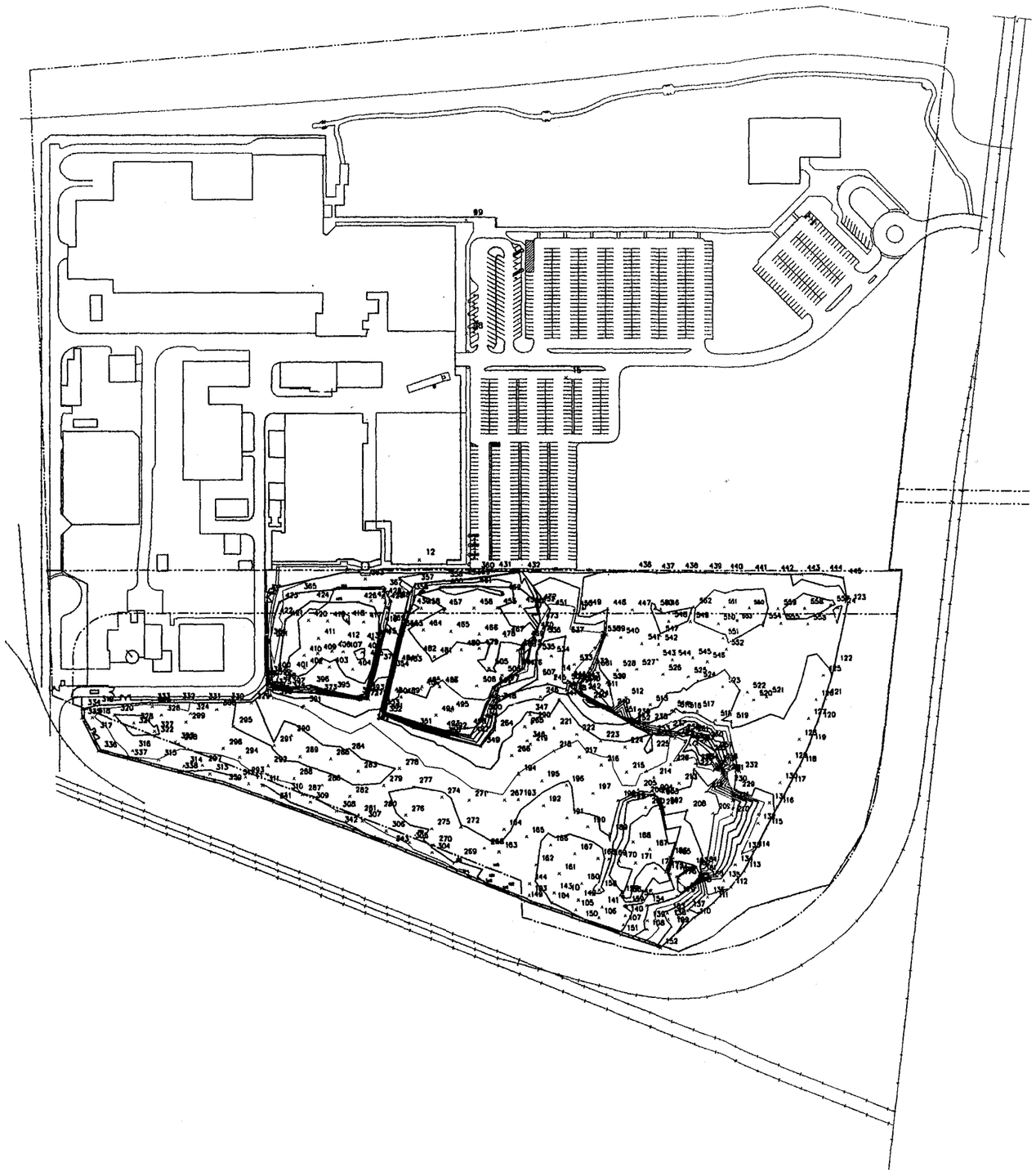
**Figure 16**
Sediment Sample Locations
Portland Harbor Sediment Investigation

BRIDGEWATER GROUP, INC.

SCOEPA00010861

# APPENDIX A – SITE GRADING PLAN

03/13/00



# Site Grading Plan

**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL CONSULTANTS

May 30, 2002

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland OR 97201-4987

HAI Project No. 5237

SUBJECT: Groundwater Elevation Monitoring Plan, Focused Remedial Investigation (RI) Activities; Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. Blischke:

In correspondence dated February 20, 2002 (Ede to Blischke), NW Natural provided a supplemental work plan to address the collection of groundwater elevation data at, and in the immediate vicinity of, the Wacker Siltronic Corporation (Wacker) property. Subsequent to the submittal of this work plan to the Oregon Department of Environmental Quality (DEQ), it was learned that access to non-NW Natural-owned wells at, and in the vicinity of, the site would not be available. As such, in correspondence dated March 15, 2002 (Blischke to Wyatt), the DEQ requested that NW Natural prepare and submit a revised, *implementable* plan for collecting water levels prior to conducting the fourth (and final) groundwater monitoring event at the site, currently scheduled for late June or early July 2002.

Contained herein is a revised groundwater elevation monitoring plan, to be implemented during the final groundwater monitoring event at the site. The proposed groundwater elevation monitoring activities are fully implementable, and with one exception are identical to those activities that have previously been conducted by NW Natural during the October 2001, December 2001, and April 2002 groundwater monitoring events. The exception involves the completion of a continuous short-term (minimum 48-hour) groundwater elevation monitoring event at select NW Natural-owned monitoring wells at, and adjacent to, the Wacker site. Details are provided below.

## 1.0 Routine Water Level Monitoring

NW Natural's access to those Wacker wells that pre-date initiation of source control investigation activities at the site (i.e., wells WS-1 through WS-5, and WS-10), or to any Aventis Crop Science (Aventis) wells, has not been granted. As such, water levels in only those monitoring wells at the Wacker site that are accessible to NW Natural (WS-8-33, WS-8-59, and WS-9-34) will be measured during the remaining groundwater monitoring event at Wacker. These data, in conjunction with data collected during the October 2001, December 2001, and April 2002 groundwater monitoring events, will support evaluation of

seasonal fluctuations in groundwater elevations. As during previous sampling events, these water levels will be collected synchronously with water levels collected from wells located at the adjacent NW Natural, Gasco property. If possible, these data collection activities will be coordinated with area-wide water level monitoring activities potentially conducted by others at nearby Aventis and Atofina wells, as well as those Wacker wells not owned by NW Natural. Further, river stage data will be collected from an established benchmark located at the NW Natural – Gasco site, located immediately downstream of the Wacker property.

The static water levels in the monitoring wells will be measured using a Solinst water level indicator (conductive probe). The water levels will be measured from the north side of the top of the casing.

## 2.0 Short-Term Continuous Water Level Monitoring Test

A minimum 48-hour continuous water level monitoring test will take place at those Wacker wells that are accessible to NW Natural (WS-8-33, WS-8-59, and WS-9-34) and at select NW Natural-Gasco facility wells to evaluate interconnectivity with the river. The objective of the continuous water level monitoring test will be to evaluate the significance of tidal and river stage fluctuations in the Willamette River with regard to groundwater flow direction and hydraulic gradients in the vicinity of the Wacker site. Water levels will be collected electronically on a continuous basis (i.e., every 15 minutes) using pressure transducers / data loggers placed within selected individual wells. Water levels will also be simultaneously recorded in the river to compare to the groundwater levels. River level measurement will be collected at the established monitoring station immediately down-river of Wacker at the NW Natural Gasco facility. In addition to the preceding, site-specific rainfall and barometric pressure data will be collected during the course of the test from an existing weather station located on the adjacent NW Natural Gasco property. Sampling points to be included within the short-term continuous water level monitoring test are identified below, and are included on Figure 1.

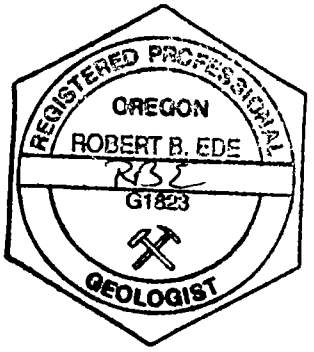
| **Monitoring Point** | **Water-Bearing Zone** |
|---|---|
| WS-8-33 | Surficial Fill |
| WS-8-59 | Alluvial |
| WS-9-34 | Surficial Fill |
| MW-4-56 (Gasco) | Alluvial |
| MW-8-29 (Gasco) | Surficial Fill |
| MW-8-61 (Gasco) | Alluvial |
| Willamette River (Gasco) | - |

If you have any questions regarding this proposal, please do not hesitate to contact me at 503-796-0717.

Sincerely,

Robert Ede, R.G.
Associate

rede@hahnasoc.com




c: Mr. Bob Wyatt, NW Natural
Ms. Patty Dost, Schwabe, Williamson & Wyatt
Mr. Carl Stivers, Anchor Environmental, LLC
Ms. Cathryn Young, Wacker Siltronic Corporation

Willamette River

Former Western Transportation
Docks and Structures
(1930-1950)

SD-062 SD-063 SD-064 SD-065 SD-067 SD-068 SD-069 SD-070 SD-072 SD-075 SD-077

P-1 P-2 P-3 P-4 P-5 P-6 P-7 P-8 P-9 P-10 P-11

WS8-59 WS8-33 WS9-34

MW-2 MW-3 MW-4 MW-5 MW-6 MW-8 MW-9 MW-10 MW-11 MW-12 MW-13 MW-14 MW-15

NW Natural

B-1 B-1-8 B-2-8 B-3 B-3-8 B-4-8 B-5-8 B-32 B-33 B-34 B-35 B-101-8 B-102-8 B-HQ-8 B-SU-8

1981 Chromic / Nitric Acid Spill Location

1984 TCE Spill Location

1997 Caustic Solution Spill Location

WS10-30 location (approximate)

Wacker Siltronic

GP-11 GP-25 GP-26 GP-27 RP-01 RP-06

Utility Easement

Wastewater Treatment Plant Spill Locations

WS-1 WS-2 WS-3 WS-4 WS-5 WS-6 WS-7 W-3-81

RP-03 (abandoned) RP-03R

PZ-02

NW St. Helens Road

N

**LEGEND**

- Site Boundary
- Existing Structure or Feature
- Railroad Tracks
- Proposed Push Probe Boring Location
- Existing Monitoring Well Location
- EPA Sediment Sampe Location
- Select Boring Location (pre-2001)
- Push Probe Boring Location (HAI, 2001)
- Combined Stormwater / Process Effluent Sewer Line
- Stormwater Sewer Line
- Abandoned Utility Line
- Fire Water Line
- Olympic Petroleum Lines (2-14-inch)
- Natural Gas Line (16-inch/10-inch)

Note: Locations are approximate: Survey of 2001 sample locations not finalized

0 250 500
Approximate Scale in Feet

**Figure 1**

**Monitoring Well and Push Probe Location Map**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

**HAHN & ASSOCIATES, INC.**
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717

**May 2002**

**Project No. 5237**

SCOEPA00010867

April 18, 2002

0-61M-10703-0/Task 43

RECEIVED
APR 19 2002
DEPT OF ENVIRONMENTAL QUALITY
NORTHWEST REGION

Eric Blischke
Coordinator, Portland Harbor
Department of Environmental Quality
2020 S.W. 4th Avenue
Portland, Oregon 97201

Dear Mr. Blischke:

**Re: Focused Spring 2002 Groundwater Characterization Event**
**Water Level Measurements**
**RPAC - Portland Site**
**Portland, Oregon**

On behalf of Aventis CropScience (RPAC), AMEC Earth & Environmental, Inc. (AMEC) is providing to the Oregon Department of Environmental (DEQ) the results of water level monitoring at the RPAC Site. RPAC understands that DEQ coordinated a synchronous water level monitoring event among several property owners near the RPAC property and, therefore, RPAC is submitting the RPAC water level monitoring results for DEQ's use and review. The attached water level data will also be submitted in the forthcoming Groundwater Monitoring Report for the Spring 2002 groundwater event.

AMEC collected groundwater level and surface water level information according to the scope and procedures included in the Final Focused Spring 2002 Groundwater Characterization Field Sampling Plan (FSP) dated March 8, 2002, and approved by DEQ in a letter dated March 14, 2002. Water level measurements were collected on April 2 and 3, 2002. AMEC is currently proceeding with groundwater sampling according to the FSP. Please note that the four monitoring wells to be installed at the Wacker property (series RP-07 wells) are scheduled for installation the week of April 15 and, therefore, water level measurements from these wells are not included in this submittal. Following installation of the RP-07 series monitoring wells, water level measurements and groundwater samples will be collected according to the FSP.

AMEC Earth & Environmental, Inc.
7376 SW Durham Road
Portland, Oregon
USA 97224
Tel +1 (503) 639-3400
Fax +1 (503) 620-7892

www.amec.com

K:\10000\10700\10703\Task 43 Groundwater Monitoring\2002 Spring Event\Water Levels to DEQ\DEQ ltr - water level submittal.doc

The attached hard copy table is also provided in Microsoft Excel format on the enclosed compact disk (CD). A figure of monitoring well and staff gauge locations is also attached for your reference. If you have any questions, please call Roger Gresh at (503) 639-3400.

Sincerely,

**AMEC Earth & Environmental, Inc.**

for

Roger Gresh, P.G.
Project Manager

Teresa A.R. Wilson
Project Geologist

Attachments: Table 1 Groundwater Elevations and NAPL Thickness Measurements
Figure 1 Focused Spring 2002 Groundwater Characterization Water Level Measurement Locations

RTG/JF/lp

c: R. Ferguson, Aventis CropScience
J. Benedict, CHBH&L

REGISTERED PROFESSIONAL GEOLOGIST
OREGON
SCOTT KRANZ
No. G1944



SCOEPA00010869

# ATTACHMENTS



SCOEPA00010870

Proposed Location of RP-07 Monitoring Well Cluster.

WILLAMETTE RIVER

WACKER

ATOFINA

SCHITZER

ESCO

GOULD

GATX

METRO

N.W. 61ST AVE.

West Doane Lake

North Doane Lake

Northwest Drainage Pond

84" Concrete Pipe To Willamette River

48" Corrugated Pipe To Northwest Drainage Pond

BNSF

Rte 30

LEGEND

- Collect Water Elevation and NAPL Thickness Measurements
- Property Boundary
- Surface Water Boundary

amec

7376 SW Durham Road
Portland, OR, U.S.A. 97224

| | |
|---|---|
| W.O. | 0-61M-107030T43 |
| DESIGN | TARW |
| DRAWN | BRJ |
| DATE | APRIL 2002 |
| SCALE | 1"=350' |

**FIGURE 1**
**FOCUSED SPRING 2002**
**GROUNDWATER CHARACTERIZATION**
**WATER LEVEL MEASUREMENT LOCATIONS**
**RPAC, PORTLAND SITE**

AMEC DRAWING NO. K:\10000\10700\10703\Task 43 Groundwater Monitoring\2002 Spring Event\FSP\Spring 2002 Water Level Measurement Locations.dwg

# TABLE 1
## Groundwater Elevations and NAPL Thickness Measurements
## Focused Spring 2002 Groundwater Characterization Event, April 2002
## RPAC - Portland Site

| Site ID | Type | Location/Property | Location: x coordinate | Location: y coordinate | Depth to Water (Feet BMP) | Date | Time | Measuring Point Elevation (Feet AMSL) | Groundwater Elevation | LNAPL Thickness (Feet) | DNAPL Thickness (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AL2-17 | Well | RPAC - LAKE AREA | 7625853.2 | 701670.4 | 11.71 | 4/2/2002 | 16:03 | 41.77 | 30.06 | None | None |
| AL2-32 | Well | RPAC - LAKE AREA | 7625880.3 | 701656 | 13.82 | 4/2/2002 | 15:59 | 41.41 | 27.59 | None | None |
| AL2-46 | Well | RPAC - LAKE AREA | 7625861.6 | 701665.6 | 14.08 | 4/2/2002 | 16:05 | 41.77 | 27.69 | None | None |
| AL4-47 | Well | RPAC - LAKE AREA | 7625605.9 | 701768.4 | 12.60 | 4/2/2002 | 15:24 | 40.24 | 27.64 | None | None |
| AL5-19 | Well | RPAC - LAKE AREA | 7625744.9 | 701808.2 | 12.20 | 4/2/2002 | 15:07 | 40.07 | 27.87 | None | None |
| AL5-35 | Well | RPAC - LAKE AREA | 7625738.5 | 701816.9 | 12.50 | 4/2/2002 | 15:09 | 39.54 | 27.04 | None | None |
| AL5-62 | Well | RPAC - LAKE AREA | 7625732.4 | 701825.1 | 12.61 | 4/2/2002 | 15:12 | 39.59 | 26.98 | None | None |
| AL6-96 | Well | RPAC - LAKE AREA | 7625941.2 | 702105.3 | 15.29 | 4/2/2002 | 14:42 | 38.72 | 23.43 | None | None |
| ASW-01A | Well | METRO | 7626802.2 | 700791.6 | 6.16 | 4/2/2002 | 14:15 | 38.81 | 32.65 | None | None |
| ASW-04 | Well | METRO | 7626539.5 | 700840.6 | 6.83 | 4/2/2002 | 14:28 | 40.76 | 33.93 | None | None |
| ASW-05 | Well | METRO | 7626395.202 | 701003.193 | 7.57 | 4/2/2002 | 13:28 | * | NA | None | None |
| ASW-06 | Well | METRO | 7626207.1 | 701185.3 | 6.26 | 4/2/2002 | 13:43 | 40.10 | 33.84 | None | None |
| ASW-08 | Well | METRO | 7626937.7 | 700982.2 | 6.50 | 4/2/2002 | 14:07 | 36.72 | 30.22 | None | None |
| BST2W-61 | Well | RPAC - LAKE AREA | 7625870.5 | 701660.7 | 13.61 | 4/2/2002 | 16:08 | 41.13 | 27.52 | None | None |
| BST5W-74 | Well | RPAC - LAKE AREA | 7625751.1 | 701800.5 | 13.18 | 4/2/2002 | 15:19 | 39.84 | 26.66 | None | None |
| BTB-4A-84 | Well | RPAC - LAKE AREA | 7625792.8 | 702051.7 | 14.94 | 4/2/2002 | 14:55 | 39.50 | 24.56 | None | None |
| BTB-4B-25 | Well | RPAC - LAKE AREA | 7625786.5 | 702041.4 | 9.57 | 4/2/2002 | 14:51 | 39.54 | 29.97 | None | None |
| BTB-4B-55 | Well | RPAC - LAKE AREA | 7625786.5 | 702041.4 | 15.21 | 4/2/2002 | 14:52 | 39.81 | 24.60 | None | None |
| KM-MW-2 | Well | KINDER MORGAN | 7625073.18 | 701633.63 | 23.49 | 4/2/2002 | 09:10 | 50.68 | 27.19 | None | None |
| KM-MW-5 | Well | KINDER MORGAN | 7624986.16 | 701751.74 | 21.99 | 4/2/2002 | 09:14 | 50.78 | 28.79 | None | None |
| MW-01-26 | Well | RPAC - HERBICIDE AREA | 7625867.5 | 700954.5 | 10.57 | 4/2/2002 | 13:38 | 49.89 | 39.32 | None | None |
| MW-01-41 | Well | RPAC - HERBICIDE AREA | 7625861.2 | 700960.5 | 12.71 | 4/2/2002 | 13:40 | 49.53 | 36.82 | None | None |
| MW-01-56 | Well | RPAC - HERBICIDE AREA | 7625856.9 | 700964.4 | 12.96 | 4/2/2002 | 13:42 | 49.70 | 36.74 | None | None |
| MW-01-76 | Well | RPAC - HERBICIDE AREA | 7625878.6 | 700941.1 | 15.51 | 4/2/2002 | 13:36 | 47.70 | 32.19 | None | None |
| MW-02-26 | Well | RPAC - HERBICIDE AREA | 7626028 | 700958.6 | 11.67 | 4/3/2002 | 09:32 | 48.09 | 36.42 | None | None |
| MW-02-46 | Well | RPAC - HERBICIDE AREA | 7626033.4 | 700952.6 | 11.51 | 4/3/2002 | 09:30 | 47.91 | 36.40 | None | None |
| MW-02-62 | Well | RPAC - HERBICIDE AREA | 7626038.2 | 700947.4 | 11.09 | 4/3/2002 | 09:27 | 48.00 | 36.91 | None | None |
| MW-03-27 | Well | RPAC - HERBICIDE AREA | 7626150.1 | 701025.8 | 12.43 | 4/3/2002 | 09:12 | 48.29 | 35.86 | None | None |
| MW-03-49 | Well | RPAC - HERBICIDE AREA | 7626155.8 | 701030.9 | 12.39 | 4/3/2002 | 09:04 | 48.28 | 35.89 | None | None |
| MW-03-68 | Well | RPAC - HERBICIDE AREA | 7626162.2 | 701035 | 12.31 | 4/3/2002 | 09:06 | 48.25 | 35.94 | None | None |
| MW-03-81 | Well | WACKER | 7625335.5 | 703198.3 | 18.41 | 4/2/2002 | 09:41 | 35.54 | 17.13 | None | None |
| MW-03-I | Well | WACKER | 7625304.4 | 703241.6 | 18.94 | 4/2/2002 | 09:33 | 36.43 | 17.49 | None | None |
| MW-03-S | Well | WACKER | 7625301.2 | 703236.6 | 11.86 | 4/2/2002 | 09:36 | 36.35 | 24.49 | None | None |
| MW-04-27 | Well | RPAC - HERBICIDE AREA | 7626025.4 | 701264.7 | 14.81 | 4/3/2002 | 09:52 | 47.53 | 32.72 | None | None |
| MW-04-47 | Well | RPAC - HERBICIDE AREA | 7626031.2 | 701258 | 14.51 | 4/3/2002 | 09:55 | 47.65 | 33.14 | None | None |
| MW-04-63 | Well | RPAC - HERBICIDE AREA | 7626035 | 701250.7 | 14.59 | 4/3/2002 | 09:59 | 48.00 | 33.41 | None | None |
| MW-05-24 | Well | RPAC - HERBICIDE AREA | 7625886.2 | 701462.8 | 7.60 | 4/3/2002 | 10:20 | 37.83 | 30.23 | None | None |



SCOEPA0010872

# TABLE 1
## Groundwater Elevations and NAPL Thickness Measurements
## Focused Spring 2002 Groundwater Characterization Event, April 2002
## RPAC - Portland Site

| Site ID | Type | Location/Property | Location: x coordinate | Location: y coordinate | Depth to Water (Feet BMP) | Date | Time | Measuring Point Elevation (Feet AMSL) | Groundwater Elevation | LNAPL Thickness (Feet) | DNAPL Thickness (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-05-34 | Well | RPAC - HERBICIDE AREA | 7625891.9 | 701457.8 | 7.78 | 4/3/2002 | 10:23 | 37.83 | 30.05 | None | None |
| MW-05-52 | Well | RPAC - HERBICIDE AREA | 7625897.6 | 701452.7 | 10.00 | 4/3/2002 | 10:26 | 37.70 | 27.70 | None | None |
| MW-05-70 | Well | RPAC - HERBICIDE AREA | 7625867.6 | 701464.5 | 10.82 | 4/3/2002 | 10:36 | 38.33 | 27.51 | None | None |
| MW-06-S | Well | WACKER | 7625042.4 | 703062.3 | 11.36 | 4/2/2002 | 10:14 | 36.37 | 25.01 | None | None |
| MW-07-S | Well | WACKER | 7624746.3 | 702935.8 | 12.44 | 4/2/2002 | 10:06 | 37.32 | 24.88 | None | None |
| MW-08-27 | Well | RPAC - HERBICIDE AREA | 7625892.8 | 701277 | 23.25 | 4/9/2002 | 15:30 | 48.23 | 24.98 | 6.63** | None |
| MW-08-46 | Well | RPAC - HERBICIDE AREA | 7625883.4 | 701295 | 16.15 | 4/3/2002 | 10:35 | 48.11 | 31.96 | None | None |
| MW-08-64 | Well | RPAC - HERBICIDE AREA | 7625889.7 | 701288.5 | 15.98 | 4/3/2002 | 10:25 | 47.97 | 31.99 | None | None |
| MW-09-23 | Well | RPAC - HERBICIDE AREA | 7626326.3 | 700942.1 | 12.55 | 4/3/2002 | 08:50 | 47.03 | 34.48 | None | None |
| MW-09-42 | Well | RPAC - HERBICIDE AREA | 7626330.3 | 700938.3 | 13.30 | 4/3/2002 | 08:53 | 47.64 | 34.34 | None | None |
| MW-09-58 | Well | RPAC - HERBICIDE AREA | 7626333.2 | 700931.7 | 12.29 | 4/3/2002 | 08:55 | 46.21 | 33.92 | None | None |
| MW-09-80 | Well | RPAC - HERBICIDE AREA | 7626322.2 | 700946.8 | 12.49 | 4/3/2002 | 08:47 | 46.67 | 34.18 | None | None |
| MW-10-24 | Well | RPAC - INSECTICIDE AREA | 7626485 | 700767.1 | 11.69 | 4/2/2002 | 15:24 | 46.21 | 34.52 | None | None |
| MW-10-44 | Well | RPAC - INSECTICIDE AREA | 7626477.8 | 700773.7 | 12.04 | 4/2/2002 | 15:26 | 46.54 | 34.50 | None | None |
| MW-10-57 | Well | RPAC - INSECTICIDE AREA | 7626470.7 | 700780.8 | 11.95 | 4/2/2002 | 15:28 | 46.66 | 34.71 | None | None |
| MW-11-24 | Well | RPAC - INSECTICIDE AREA | 7626634 | 700606.4 | 9.44 | 4/2/2002 | 14:52 | 44.01 | 34.57 | None | None |
| MW-11-37 | Well | RPAC - INSECTICIDE AREA | 7626639.6 | 700598.6 | 9.14 | 4/2/2002 | 14:54 | 43.80 | 34.66 | None | None |
| MW-11-56 | Well | RPAC - INSECTICIDE AREA | 7626646.4 | 700591.5 | 8.59 | 4/2/2002 | 14:56 | 43.63 | 35.04 | None | None |
| MW-11-79 | Well | RPAC - INSECTICIDE AREA | 7626626.5 | 700615.7 | 8.57 | 4/2/2002 | 14:59 | 44.14 | 35.57 | None | None |
| MW-12-27 | Well | RPAC - INSECTICIDE AREA | 7626272.7 | 700596 | 12.85 | 4/2/2002 | 13:20 | 50.22 | 37.37 | None | None |
| MW-12-41 | Well | RPAC - INSECTICIDE AREA | 7626279.3 | 700587.8 | 12.69 | 4/2/2002 | 13:25 | 50.08 | 37.39 | None | None |
| MW-12-59 | Well | RPAC - INSECTICIDE AREA | 7626285.7 | 700579.9 | 12.14 | 4/2/2002 | 13:26 | 49.58 | 37.44 | None | None |
| MW-12-79 | Well | RPAC - INSECTICIDE AREA | 7626266.6 | 700605.4 | 12.82 | 4/2/2002 | 13:15 | 50.08 | 37.26 | None | None |
| P-07 | Piezometer | RPAC - HERBICIDE AREA | 7625960.462 | 701359.943 | 14.59 | 4/3/2002 | 10:03 | 46.27 | 31.68 | None | None |
| P-10 | Piezometer | RPAC | 7625801.802 | 701388.893 | 9.44 | 4/3/2002 | 09:13 | 40.19 | 30.75 | None | None |
| P-11 | Piezometer | RPAC - HERBICIDE AREA | 7625852.1 | 701523.1 | 9.50 | 4/3/2002 | 09:03 | 39.29 | 29.79 | None | None |
| PP-08 | Piezometer | RPAC - LAKE AREA | 7625560.6 | 701843.3 | 10.26 | 4/2/2002 | 15:29 | 37.76 | 27.50 | None | None |
| PZ-02-40 | Piezometer | RTE 30/ COP ROW | 7624207.6 | 702784.8 | 36.29 | 4/2/2002 | 09:30 | 64.53 | 28.24 | None | None |
| PZ-1-11 | Piezometer | BNSF | 7626583.3 | 700421.9 | 6.46 | 4/2/2002 | 12:55 | 45.28 | 38.82 | None | None |
| RP-01-31 | Well | BNSF | 7626192.5 | 703665.7 | 25.21 | 4/2/2002 | 08:50 | 35.38 | 10.17 | None | None |
| RP-01-51 | Well | BNSF | 7626189.7 | 703662.3 | 25.15 | 4/2/2002 | 08:53 | 35.28 | 10.13 | None | None |
| RP-01-65 | Well | BNSF | 7626185.1 | 703657.9 | 24.95 | 4/2/2002 | 08:56 | 35.00 | 10.05 | None | None |
| RP-02-31 | Well | ATOFINA | 7626667.3 | 703244.5 | 30.41 | 4/2/2002 | 10:15 | 40.12 | 9.71 | None | None |
| RP-02-49 | Well | ATOFINA | 7626661.8 | 703250.7 | 30.15 | 4/2/2002 | 10:17 | 39.83 | 9.68 | None | None |
| RP-02-66 | Well | ATOFINA | 7626657.2 | 703255.3 | 30.41 | 4/2/2002 | 10:20 | 39.70 | 9.29 | None | None |
| RP-03-30R | Well | BNSF | 7624856.4 | 702724.3 | 14.84 | 4/2/2002 | 10:45 | 36.61 | 21.77 | None | None |
| RP-03-52R | Well | BNSF | 7624840.7 | 702723.1 | 17.10 | 4/2/2002 | 10:42 | 36.60 | 19.50 | None | None |



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# TABLE 1
## Groundwater Elevations and NAPL Thickness Measurements
## Focused Spring 2002 Groundwater Characterization Event, April 2002
## RPAC - Portland Site

| Site ID | Type | Location/Property | Location: x coordinate | Location: y coordinate | Depth to Water (Feet BMP) | Date | Time | Measuring Point Elevation (Feet AMSL) | Groundwater Elevation | LNAPL Thickness (Feet) | DNAPL Thickness (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RP-04-16 | Piezometer | BNSF | 7625459.1 | 701934.4 | 9.88 | 4/2/2002 | 15:37 | 33.66 | 23.78 | None | None |
| RP-04-41 | Well | BNSF | 7625465.8 | 701926.5 | 7.37 | 4/2/2002 | 15:41 | 34.10 | 26.73 | None | None |
| RP-05-16 | Piezometer | BNSF | 7625594.7 | 701608.5 | 11.92 | 4/2/2002 | 16:11 | 40.54 | 28.62 | None | None |
| RP-06-30 | Well | BNSF | 7625738.7 | 703482 | 16.60 | 4/2/2002 | 11:03 | 37.10 | 20.50 | None | None |
| RP-06-87 | Well | BNSF | 7625734.6 | 703476.9 | 25.41 | 4/2/2002 | 11:00 | 37.20 | 11.79 | None | None |
| RPW-02 | Well | RPAC - INSECTICIDE AREA | 7626418.2 | 700588.6 | 9.99 | 4/2/2002 | 15:37 | 47.07 | 37.08 | None | None |
| RPW-03 | Well | RPAC - INSECTICIDE AREA | 7626550 | 700721.2 | 9.19 | 4/2/2002 | 15:13 | 43.94 | 34.75 | None | None |
| RPW-05 | Well | RPAC - HERBICIDE AREA | 7625734 | 701204.5 | 15.91 | 4/3/2002 | 09:24 | 49.83 | 33.92 | None | None |
| SG-NDL | Staff Gauge | NORTH DOANE LAKE | 7625168.5 | 702282 | 4.05 | 4/3/2002 | 13:10 | 27.46 | 23.41 | None | None |
| SG-NDP | Staff Gauge | NW DRAINAGE POND | 7624779.93 | 702767.56 | 5.66 | 4/2/2002 | 10:36 | 24.81 | 19.15 | None | None |
| SG-WDL | Staff Gauge | WEST DOANE LAKE | 7625497.9 | 702242.6 | 2.12 | 4/2/2002 | 14:30 | 26.74 | 24.62 | None | None |
| W-03-D | Well | GOULD | 7626410.6 | 702274.3 | 11.82 | 4/2/2002 | 12:08 | 32.47 | 20.65 | None | None |
| W-03-I | Well | GOULD | 7626401.2 | 702273.6 | 8.04 | 4/2/2002 | 12:04 | 32.93 | 24.89 | None | None |
| W-03-S | Well | GOULD | 7626408.2 | 702283.4 | 9.39 | 4/2/2002 | 11:57 | 34.17 | 24.78 | None | None |
| W-04-89 | Well | GOULD | 7626639.1 | 701977.4 | 10.68 | 4/2/2002 | 11:44 | 35.94 | 25.26 | None | None |
| W-04-I | Well | GOULD | 7626623.8 | 701996.9 | 9.05 | 4/2/2002 | 11:31 | 32.52 | 23.47 | None | None |
| W-04-S | Well | GOULD | 7626634.8 | 701966.8 | 6.85 | 4/2/2002 | 11:34 | 32.57 | 25.72 | None | None |
| W-06-B | Well | RPAC - LAKE AREA | 7625721.9 | 701553.5 | 12.40 | 4/2/2002 | 15:59 | 39.96 | 27.56 | None | None |
| W-06-D | Well | RPAC - LAKE AREA | 7625721.5 | 701544.1 | 9.65 | 4/2/2002 | 16:02 | 41.10 | 31.45 | None | None |
| W-06-S | Well | RPAC - LAKE AREA | 7625728.3 | 701552.6 | 10.10 | 4/2/2002 | 15:57 | 39.55 | 29.45 | None | None |
| W-08 | Well | RPAC - LAKE AREA | 7625548.3 | 702140.4 | 8.32 | 4/2/2002 | 14:25 | 35.87 | 27.55 | None | None |
| W-08-26 | Well | RPAC - LAKE AREA | 7625553.9 | 702141.2 | 9.71 | 4/2/2002 | 14:20 | 38.66 | 28.95 | None | None |
| W-08-74 | Well | RPAC - LAKE AREA | 7625551.3 | 702147.6 | 12.54 | 4/2/2002 | 14:22 | 38.77 | 26.23 | None | None |
| W-09 | Well | RPAC - LAKE AREA | 7625599.7 | 702482.4 | 7.30 | 4/2/2002 | 14:11 | 34.88 | 27.58 | None | None |
| W-09-116 | Well | RPAC - LAKE AREA | 7625596.4 | 702465.4 | 17.26 | 4/2/2002 | 14:08 | 38.12 | 20.86 | None | None |
| W-09-86 | Well | RPAC - LAKE AREA | 7625601 | 702460.4 | 17.60 | 4/2/2002 | 14:04 | 38.54 | 20.94 | None | None |
| W-10 | Well | PUMP STATION | 7625912.5 | 703183.7 | 18.62 | 4/2/2002 | 09:11 | 31.99 | 13.37 | None | None |
| W-11-B | Well | ESCO | 7625949 | 702792.3 | 26.46 | 4/2/2002 | 10:39 | 41.33 | 14.87 | None | None |
| W-11-D | Well | ESCO | 7625950.3 | 702782.3 | 25.95 | 4/2/2002 | 10:43 | 40.09 | 14.14 | None | None |
| W-11-I | Well | ESCO | 7625950.3 | 702782.3 | 25.78 | 4/2/2002 | 10:41 | 40.28 | 14.50 | None | None |
| W-11-S | Well | ESCO | 7625948.8 | 702772.3 | 9.70 | 4/2/2002 | 10:45 | 40.90 | 31.20 | None | None |
| W-12-D | Well | ESCO | 7626093.7 | 702364.1 | 20.76 | 4/2/2002 | 10:58 | 41.63 | 20.87 | None | None |
| W-12-I | Well | ESCO | 7626093.7 | 702364.1 | 20.62 | 4/2/2002 | 11:02 | 41.66 | 21.04 | None | None |
| W-12-S | Well | ESCO | 7626086.5 | 702373.1 | 11.79 | 4/2/2002 | 10:55 | 41.41 | 29.62 | None | None |
| W-15-D | Well | METRO | 7626631 | 701454.2 | 11.34 | 4/2/2002 | 13:59 | 40.53 | 29.19 | None | None |
| W-15-I | Well | METRO | 7626631 | 701454.2 | 10.68 | 4/2/2002 | 13:57 | 40.72 | 30.04 | None | None |
| W-15-S | Well | METRO | 7626622.9 | 701462.4 | 10.82 | 4/2/2002 | 13:55 | 40.82 | 30.00 | None | None |

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# TABLE 1
## Groundwater Elevations and NAPL Thickness Measurements
## Focused Spring 2002 Groundwater Characterization Event, April 2002
## RPAC - Portland Site

| Site ID | Type | Location/Property | Location: x coordinate | Location: y coordinate | Depth to Water (Feet BMP) | Date | Time | Measuring Point Elevation (Feet AMSL) | Groundwater Elevation | LNAPL Thickness (Feet) | DNAPL Thickness (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| W-16-31 | Well | SCHNITZER | 7626965 | 701634 | 6.80 | 4/2/2002 | 11:47 | 33.70 | 26.90 | None | None |
| W-16-D | Well | SCHNITZER | 7626954.6 | 701648.8 | 10.18 | 4/2/2002 | 11:52 | 35.44 | 25.26 | None | None |
| W-16-I | Well | SCHNITZER | 7626954.6 | 701648.8 | 10.10 | 4/2/2002 | 11:50 | 35.42 | 25.32 | None | None |
| W-16-S | Well | SCHNITZER | 7626949.9 | 701653.3 | 7.11 | 4/2/2002 | 11:54 | 35.07 | 27.96 | None | None |
| W-18-D | Well | UPGRADIENT | 7625753.3 | 700727.9 | 18.41 | 4/2/2002 | 08:55 | 55.70 | 37.29 | None | None |
| W-18-I | Well | UPGRADIENT | 7625770.1 | 700727.6 | 16.89 | 4/2/2002 | 08:50 | 54.73 | 37.84 | None | None |
| W-18-S | Well | UPGRADIENT | 7625765.8 | 700734.3 | 16.32 | 4/2/2002 | 08:52 | 55.23 | 38.91 | None | None |
| W-19-D | Well | ATOFINA | 7626363.1 | 703467.2 | 24.42 | 4/2/2002 | 09:59 | 35.12 | 10.70 | None | None |
| W-19-I | Well | ATOFINA | 7626348.5 | 703475 | 24.85 | 4/2/2002 | 09:55 | 35.34 | 10.49 | None | None |
| W-19-S | Well | ATOFINA | 7626357.7 | 703470.9 | 24.63 | 4/2/2002 | 09:58 | 35.20 | 10.57 | None | None |

Notes:

| | |
|---|---|
| BMP | Below Measuring Point |
| NA | Not Applicable |
| AMSL | Above Mean Sea Level, in City of Portland (COP) datum |
| LNAPL | Light Non-Aqueous-Phase Liquid |
| DNAPL | Dense Non-Aqueous-Phase Liquid |
| * | Survey data not available |
| ** | An estimated NAPL thickness of 8.5 feet and a depth to water of 23.14 feet BMP were recorded on April 3, 2002, using an electronic water level probe; this monitoring well was re-measured using an interface probe on April 9, 2002, with results as indicated in this table. |

Note: Groundwater Elevations have not been adjusted for potential displacement by LNAPL/DNAPL. NAPL was measured within bailers retrieved from monitoring wells, on well sounding equipment, and/or through the use of an interface probe. This is considered to approximate the thickness of NAPL in the monitoring well. The NAPL thickness measured within bailers retrieved from monitoring wells does not represent the actual thickness of NAPL in the formation.

SCOEPA00010875

**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL CONSULTANTS

January 15, 2002

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland OR 97201-4987

HAI Project No. 5237

SUBJECT: December 2001 Progress Report for Remedial Investigation (RI) Activities, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. Blischke:

Hahn and Associates, Inc. (HAI) has prepared this Progress Report summarizing RI work activities that have occurred relating to the Wacker Siltronic Corporation (Wacker) property during the month of December 2001. RI field activities are being conducted as per the approved *Final Focused Remedial Investigation (RI) Work Plan*[1] (RI Work Plan) prepared for the site. This Progress Report has been prepared as per an Order (DEQ No. ECVC-NWR-00-27) issued jointly to both NW Natural and Wacker by the Oregon Department of Environmental Quality (ODEQ), dated October 4, 2000.

As per the referenced Order, monthly progress reports are to be prepared by the 15th day of each month, with the reporting to continue for the duration of the project.

**Summary of Activities in December 2001**

The second quarterly groundwater monitoring event associated with the three monitoring wells installed in September 2001 at the Wacker property (WS-8-33, WS-8-59, and WS-9-34) was conducted by HAI on December 12 and 13, 2001. These sampling activities were conducted synchronously with sampling activities conducted at the adjacent NW Natural property. Although proposed in the Work Plan, water levels from select Rhone-Poulenc wells were not collected during the December sampling event at Wacker since access to these wells has not yet been received from the well owner (Rhone-Poulenc) or the right-of-way owner (Burlington Northern Santa Fe Railroad). Otherwise, all sampling activities were conducted in accordance with the ODEQ-approved RI Work Plan.

Due to the identification of significant trichloroethene (TCE) and vinyl chloride concentrations at a depth of 100 feet bgs at the P-2 push probe location (as reported in the November 2001 Progress Report), the contaminant conceptual model for the site has changed from that presented during the September 7, 2001 scoping of monitoring well locations and depths. In light of the TCE and vinyl chloride-driven changes to the conceptual model, a meeting with NW Natural and the ODEQ was conducted on December

[1] Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1, 2001.

21, 2001 such that options for completion of focused RI activities at the site could be discussed and evaluated. During this meeting, issues including the source for the TCE-related impacts were discussed, as were options for dividing the responsibility for completion of remaining investigations at the site. Due to the identified TCE impacts, it was agreed that installation of the originally proposed up-gradient well cluster (WS-10) should be postponed until such a time that the well cluster could be incorporated into additional TCE-related investigations at the site.

To account for delays associated with lack of site access, a second 60-day extension for completion of fieldwork was granted by the ODEQ in correspondence dated December 21, 2001 (Blischke to Wyatt). This 60-day extension moves the target completion date for Phase I RI field activities to February 22, 2002.

**Anticipated Activities in January and February 2002**

As required by ODEQ Order No. ECVC-NWR-00-27, as modified by the extensions granted within correspondence dated October 23, 2001 and December 21, 2001 (Mr. Eric Blischke to Mr. Bob Wyatt), site characterization activities are to be completed 240 days from receipt of Work Plan approval. With approval of the RI Work Plan by the ODEQ on June 26, 2001, this equates to a Phase I field work completion date of February 22, 2002.

Remaining Phase I RI tasks to be completed at the site include: 1) completion of aquifer slug tests on select newly installed monitoring wells; 2) development and implementation of a plan for conducting a continuous short-term (48 hours) groundwater elevation monitoring event; and 3) an inspection and survey of the base of the drainage ditch located immediately west and south of the Wacker property. Tasks 1 and 2 are scheduled for completion in late January or early February 2002.

Tasks 3 will require receipt of access approval from the Burlington Northern and Santa Fe Railroad Company (BNSF), the owner of the right-of-way through which the ditch runs. Access to the BNSF property was officially requested in correspondence dated November 16, 2001. BNSF has not yet granted NW Natural access to their property.

If the foregoing report is acceptable to the ODEQ, there is no need to respond.

Sincerely,

Robert Ede, R.G.
Associate

c: Mr. Bob Wyatt, NW Natural
Ms. Patty Dost, Schwabe, Williamson & Wyatt
Mr. Carl Stivers, Anchor Environmental, L.L.C.
Ms. Cathryn Young, Wacker Siltronic Corporation



SCOEPA00010877

**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL MANAGEMENT

December 13, 2001

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland OR 97201-4987

HAI Project No. 5237

SUBJECT: November 2001 Progress Report for Remedial Investigation (RI) Activities, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. Blischke:

Hahn and Associates, Inc. (HAI) has prepared this Progress Report summarizing RI work activities that have occurred relating to the Wacker Siltronic Corporation (Wacker) property during the month of November 2001. RI field activities are being conducted as per the approved *Final Focused Remedial Investigation (RI) Work Plan*[1] (RI Work Plan) prepared for the site. This Progress Report has been prepared as per an Order (DEQ No. ECVC-NWR-00-27) issued jointly to both NW Natural and Wacker by the Oregon Department of Environmental Quality (ODEQ), dated October 4, 2000.

As per the referenced Order, monthly progress reports are to be prepared by the 15th day of each month, with the reporting to continue for the duration of the project.

**Summary of Activities in November 2001**

A November 20, 2001 *Data Package for Focused Remedial Investigation* which includes all boring logs, well construction logs, and all available soil and water analytical testing data related to investigatory activities completed at the site to date was submitted to the ODEQ in correspondence dated November 26, 2001 (Mr. Rob Ede to Mr. Eric Blischke).

As described within the November 26, 2001 cover letter to the *Data Package for Focused Remedial Investigation*, due to an initial laboratory reporting error, finalized data had one significant revision relative to those data submitted to the ODEQ in a September 5, 2001 *Preliminary Data Package*. The revision was related to groundwater sample –318, collected from a depth interval of 96 to 100 feet below ground surface (bgs) at the P-2 boring location. As reported in the finalized laboratory data, concentrations of trichloroethene (TCE) and vinyl chloride in groundwater at this location were updated from a preliminarily reported "non-detect" to instead being reported as being present at concentrations of 11,200 parts per billion (ppb), and 720 ppb, respectively.

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[1] Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1, 2001.

As previously described in correspondence dated October 9, 2001 (Mr. Rob Ede to Mr. Eric Blischke), due to concerns regarding the construction of well WS-8-59, Wacker has refused NW Natural property access with regard to installation of the WS-10 series wells. The WS-10 series wells were originally proposed for installation during the week of September 12, 2001 up-gradient of the WS-8 series wells in the immediate vicinity of the former trichloroethene (TCE) spill / soil removal area.

With regard to the above-referenced issue related to the construction of well WS-8-59, in correspondence dated November 20, 2001 (Mr. Eric Blischke to Mr. Bob Wyatt), the ODEQ provided their determination that all wells (including well WS-8-59) were installed in a manner consistent with the ODEQ-approved RI Work Plan.

To account for the delay associated with loss of site access, a 60-day extension for completion of fieldwork was granted by the ODEQ in correspondence dated October 23, 2001 (Blischke to Wyatt). This 60-day extension moves the target completion date for RI field activities to December 24, 2001, from the originally scheduled completion date of October 24, 2001.

**Anticipated Activities in December 2001 and January 2002**

The second quarterly groundwater monitoring event associated with the three monitoring wells installed in September 2001 at the Wacker property (WS-8-33, WS-8-59, and WS-9-34) will be conducted by HAI during December 2001. These sampling activities will be conducted synchronously with sampling activities conducted at the adjacent NW Natural property. Although proposed in the Work Plan, water levels from select Rhone-Poulenc wells will not be collected during the December sampling event at Wacker since access to these wells had not yet been received from the well owner (Rhone-Poulenc) or the right-of-way owner (Burlington Northern Santa Fe Railroad). Otherwise, all sampling activities will be conducted in accordance with the ODEQ-approved RI Work Plan.

As required by ODEQ Order No. ECVC-NWR-00-27, as modified within correspondence dated October 23, 2001 (Mr. Eric Blischke to Mr. Bob Wyatt), site characterization activities are to be completed 120 days from receipt of Work Plan approval, with a 60-day extension. With approval of the RI Work Plan by the ODEQ on June 26, 2001, this equates to a field work completion date of December 24, 2001.

Remaining RI activities to be completed at the site include: 1) installation of remaining monitoring wells (WS-10 series) on the Wacker property; 2) completion of aquifer slug tests on select newly installed monitoring wells; 3) development and implementation of a plan for conducting a continuous short-term (48 hours) groundwater elevation monitoring event; 4) development of a long-term (1 year) quarterly monitoring plan for newly installed monitoring wells at the Wacker site; and 5) an inspection and survey of the base of the drainage ditch located immediately west and south of the Wacker property.

Completion of Tasks 1 through 4 above are contingent upon receipt of Wacker access for the installation of remaining monitoring wells, while completion of Task 5 will require



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receipt of access approval from the Burlington Northern and Santa Fe Railroad Company, the owner of the right-of-way through which the ditch runs.

Timing with regard to receipt of site access is unknown at this time. Further, due to the identification of significant TCE and vinyl chloride concentrations at a depth of 100 feet bgs at the P-2 location, the contaminant conceptual model for the site has changed from that which was in-place during the September 7, 2001 scoping of necessary monitoring well locations and depths. In light of the TCE and vinyl chloride-driven changes to the conceptual model, it is anticipated that a meeting with NW Natural and the ODEQ will occur during December 2001 such that options for completion of focused RI activities at the site may be discussed and evaluated.

Due to the delays associated with receipt of property access (needed from Wacker, as well as from the Burlington Northern Railroad, and Rhone Poulenc, Inc.), as well as the need to meet with ODEQ to discuss options regarding completion of RI activities in light of the revised conceptual model for the site, it is clear that an additional extension for completion of RI field activities, beyond the current December 24, 2001 deadline, will be needed.

If the foregoing report is acceptable to the ODEQ, there is no need to respond.

Sincerely,

Robert Ede, R.G.
Associate

rede@hahnasoc.com

c: Mr. Bob Wyatt, NW Natural
Mr. Richard Bach, Stoel Rives LLP
Mr. Carl Stivers, Anchor Environmental, L.L.C.
Ms. Cathryn Young, Wacker Siltronic Corporation



SCOEPA00010880

**Wacker Siltronic Corporation**

7200 NW Front Avenue, MS 30
Portland, Oregon 97210-3676
Phone: (503) 219-7406

# FACSIMILE TRANSMITTAL SHEET

**DATE:** December 17, 2001

**TO:** Chris Reive
Tarlow Jordan & Schrader

**PHONE:** (503) 598-5544
**FAX:** (503) 598-7373

**FROM:** Cathryn Young

**PHONE:** (503) 219-7406
**FAX:** (503) 219-7599

**TO:** Kathi Futornick
Limno-Tech, Inc.

**PHONE:** (503) 248-1768
**FAX:** (503) 248-1959

**NUMBER OF PAGES (including this page): 4**

**MESSAGE:**

November 2001 progress report for RI activities on WSC property from Hahn & Associates dated December 13, 2001.

**********
*** TX REPORT ***
**********

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**Wacker Siltronic Corporation**

7200 NW Front Avenue, MS 30
Portland, Oregon 97210-3676
Phone: (503) 219-7406

# FACSIMILE TRANSMITTAL SHEET

**DATE:** December 17, 2001

**TO:** Chris Reive
Tarlow Jordan & Schrader

**PHONE:** (503) 598-5544
**FAX:** (503) 598-7373

**FROM:** Cathryn Young

**PHONE:** (503) 219-7406
**FAX:** (503) 219-7599

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November 2001 progress report for RI activities on WSC property from Hahn & Associates dated December 13, 2001.

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| TX/RX NO | 3358 |
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| CONNECTION ID | |
| ST. TIME | 12/17 17:24 |
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| PGS. SENT | 4 |
| RESULT | OK |

**Wacker Siltronic Corporation**

7200 NW Front Avenue, MS 30
Portland, Oregon 97210-3676
Phone: (503) 219-7406

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**NUMBER OF PAGES (including this page): 4**

**MESSAGE:**

November 2001 progress report for RI activities on WSC property from Hahn & Associates dated December 13, 2001.

**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL CONSULTANTS

November 26, 2001

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland OR 97201-4987

HAI Project No. 5237

SUBJECT: *Data Package for Focused Remedial Investigation, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon*, dated November 20, 2001

Dear Mr. Blischke:

On behalf of NW Natural, Hahn and Associates, Inc. (HAI) is submitting four copies of a data package containing a summary of investigatory results available to date for focused Remedial Investigation (RI) activities completed at the above-referenced Wacker Siltronic Corporation (Wacker) property. Specifically, this data package contains a summary of all presently available soil, groundwater, and surface water data obtained at the site as part of focused RI activities, as well as soil and well construction logs. Also included within this data package is a copy of a GeoPotential Report documenting results of the geophysical survey conducted along the riverbank at the Wacker property.

With regard to the summarized soil and water quality data provided within the enclosed data package, it is of note that these data have been summarized from finalized laboratory data reports that have undergone the laboratory's full quality control (QC) review process. As such, in limited instances, the reported analyte concentrations have changed from those that were included within the September 5, 2001 *Preliminary Groundwater Data* package previously submitted to DEQ. As you recall, the September 5, 2001 preliminary data summary was necessary to facilitate decisions regarding the location and depth of monitoring wells so that installation activities could take place during the Wacker facility shut-down that occurred during the week of September 10, 2001.

The only change of significance involves sample –318, a groundwater sample collected across a depth interval of 96 to 100 feet below ground surface (bgs) at the P-2 boring location. As described within the attached correspondence from the analytical laboratory, preliminary results for sample –318 were provided to HAI before the volatile organic compound (VOC) results were input into the preliminary laboratory report. The result was the draft reporting of all VOCs for this sample as being non-detect. The final laboratory-validated results are summarized within the enclosed data package. The finalized results are substantially different than those reported in the September 5, 2001 Preliminary Data Summary Report, with 11,200 parts per billion trichloroethene (TCE) and 720 ppb vinyl chloride having been identified in this sample. The significance of these detections alters the site contaminant conceptual model from that discussed during our meeting of September 7, 2001. It may be advantageous to schedule a meeting to discuss these results, and to consider options for completion of the focused RI activities at the site.

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Please call me at 503-796-0717 should you have any questions or wish to discuss the enclosed data package.

Sincerely,

Robert Ede, R.G.
Associate

rede@hahnasoc.com

c: Mr. Bob Wyatt, NW Natural
Ms. Sandra Hart, NW Natural, w/out enclosure
Mr. Richard Bach, Stoel Rives LLP
Mr. Carl Stivers, Anchor Environmental, LLC
Ms. Cathryn Young, Wacker Siltronic Corporation

# *Environmental Services Laboratory, Inc.*

E S L

*17400 SW Upper Boones Ferry Road, Suite 270 • Portland, OR 97224 • (503) 670-8520*


Mr. Rob Ede
Hahn and Associates
434 N.W. Sixth Avenue, Suite 203
Portland, Oregon 97209

Keith Hunter
Environmental Services Laboratory, Inc.
17400 SW Upper Boones Ferry Road, Suite 270
Portland, Oregon 97224

Mr. Rob Ede,

In reference to Wacker Sample –318 (lab I.D. 0108183-04A), mentioned in your fax dated October 24, 2001. I have reviewed the history of the reporting process and discovered that certain events took place explaining the discrepancy between the faxed result and the final result for this sample.

The data for this sample was incomplete and faxed prematurely on October 16, 2001 by our project manager. The sample had been created in our database, in other words, space was provided to enter the data for this sample into the appropriate fields, but the data had not yet been entered. This was a rare situation where the analyst was either interrupted while entering data, and the preliminary report was generated, or the analyst created the sample planning to enter the data on the following day. As a rule, analysts prepare the database for data entry only when sample results are complete and ready to enter at that time. This is the reason that no positive hits were reported for this sample in the faxed copy.

Also, contributing to this problem was the lack of the preliminary report cover letter that should have been faxed along with the preliminary data for this sample. I apologize for this series of inefficiencies on the part of our laboratory and assure you that I have spoken to the appropriate personnel to prevent this type of situation from reoccurring.

I have also reviewed the final report and the raw analytical data for this sample and believe the final report to be accurate and complete. Please do not hesitate to contact me if there is anything further that can be done to assist you with this project.

Sincerely,

Keith Hunter

PORTLAND (503) 254-3334 | ATLANTA (770) 840-8232 | BOSTON (781) 793-0800 | CHICAGO (847) 928-2600 | HOUSTON (281) 219-0356 | MIAMI (305) 592-1544 | SACRAMENTO (916) 929-2200 | SAN FRANCISCO (650) 777-9910 | SANTA ROSA (707) 665-3888

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INVOICE TO: Hahn and Associates, Inc.

CUSTOMER P.O.# / REFERENCE #: Proj. 5237

| SHIPPER NAME / PHONE | RECEIVER NAME / PHONE |
|---|---|
| Mr. Rob Ede 503 796-0717 | Ms. Cathryn Young |
| COMPANY: HAHN & ASSOCIATES | COMPANY: Wacker Siltronic Corp. |
| ADDRESS: 434 NW 6TH AVE. #203 | ADDRESS: Mail Stop 30<br>7200 NW Front Ave. |
| CITY/STATE: PORTLAND OR ZIP CODE: 97209 | CITY/STATE: Portland OR ZIP CODE: 97210-3676 |

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**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL CONSULTANTS

November 16, 2001

Staubach Global Services, Inc.
Attn: Permit Services
5650 N. Riverside Drive, Suite 101
Fort Worth, Texas 76137

HAI Project No. 5237

Subject: Environmental Access to Burlington Northern Sante Fe Railway Property, Portland, Oregon

Dear Sir or Madam:

Hahn and Associates, Inc. (HAI), on behalf of NW Natural, is completing focused Remedial Investigation (RI) activities at the Wacker Siltronic Corporation (Wacker) property, 7200 NW Front Avenue, Portland, Oregon. As part of these RI activities, NW Natural will be conducting survey activities as well as collecting quarterly groundwater elevation measurements at select monitoring wells. All RI activities are being conducted with oversight from Mr. Eric Blischke with the Oregon Department of Environmental Quality (ODEQ).

In order to provide better control with regard to groundwater flow direction, NW Natural requires access to select wells located in the immediate vicinity of the Wacker property (Figures 1 and 2). Specific wells of interest, as depicted on the attached figure (Figure 2), include wells within the PZ-02, RP-01, RP-03R, and RP-06 monitoring well clusters. As these wells are located on Burlington Northern Santa Fe Railway (BNSF) property, HAI, on behalf of NW Natural is requesting access to BNSF property for the purpose of collecting groundwater elevation measurements. Approval for specific use of the wells from the well owner (Rhone-Poulenc, Inc.) is similarly being obtained.

Access to the previously cited wells would be restricted to a one-time elevation survey (to tie into the surveyed elevations of wells within the Wacker well network), as well as to collect depth to groundwater measurements (only) during three future water level-measurement events to occur between December 2001 and December 2002.

Access to the cited wells will typically require less than one-half day, with depth to water measurements being made at each well location up to three times during this one-half day. Depth to water will be measured with a stainless steel conductive probe that is decontaminated with a detergent solution wash followed by a potable and deionized water rinse prior to insertion into any well. No investigative-derived wastes will be left on any property associated with the above-identified wells.

In addition to the above, property access to a drainage ditch located on BNSF property between the BNSF rail line and the Wacker property will be necessary such that the elevation of the base of the ditch may be surveyed. The survey work should take approximately one to two days to complete, and is tentatively scheduled to occur in December 2001. The purpose of the survey is to facilitate an evaluation of possible groundwater-surface water interaction associated with the drainage ditch. Details regarding the survey activities for this drainage ditch are provided in Section 9.2.4 of the RI Work Plan (attached).

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Enclosed please find a completed Application for Environmental Access Permit, along with the BNSF processing fee of $250. Figures depicting the location for the proposed work activities (Figures 1 and 2), as well as applicable portions of the ODEQ-approved RI Work Plan describing the proposed work activities, are similarly enclosed.

I look forward to hearing from you and am hopeful that an agreement may be reached that will allow access for the above-stated purpose. Thank you for your assistance and cooperation, and you may call me at 503-796-0717 if you would like to discuss this request in more detail.

Sincerely,

Robert Ede, R.G.

c: Robert J. Wyatt, NW Natural
Eric Blischke, ODEQ, NW Region
Richard D. Bach, Stoel Rives LLP
Cathryn Young, Wacker Siltronic Corporation

attachments



SCOEPA00010890

# ***ENVIRONMENTAL ACCESS PROCESS INSTRUCTIONS***

## How to apply for a permit:

In an effort to effectively facilitate the permit process, BNSF has partnered with Staubach Global Services who is committed to provide professional Real Estate Services. This web site is intended to provide you with all the information you should need to apply for a permit to access BNSF's property through Staubach.

Complete the application, print and mail with the following:

- The **$250.00** (non-refundable) **processing fee**, check made payable to The Burlington Northern and Santa Fe Railway Company. BNSF requires the processing fee be sent with the application, or it will be *returned*.
- **Two sets of drawings** of the area to be occupied. (Include: streets, distance from tracks and streets, mileposts if available and any distinguishing land marks.)
- **List of specific items for which you are testing.**

**TO:** **Staubach Global Services**
**Permits Department**
**5650 N. Riverside Drive, Suite 101**
**Fort Worth, Texas 76137**

If the information is not complete or is incorrect, it will delay the permit process. Please ensure all information is accurate, as each change will add $250 to the processing fee.

## Permit Process:

1. Once received by Staubach, the application and drawing will be forwarded to the engineering firm to prepare the Exhibit A drawings for the contract. **This process takes approximately 10 to 15 working days.**

2. When the Exhibit A is completed, information will be forwarded to the local BNSF Roadmaster for approval. If sampling groundwater or installing monitoring wells, information will also be sent to the specific BNSF Manager of Environmental Remediation for approval. Once approved, a contract will be prepared and two (2) copies will be forwarded to you for original signature.

3. Once received by your office, forward the signed contracts (2 copies with original signatures), along with the appropriate **payment and Certificates of Insurance (as required by the contract)** to Staubach Global Services Permits Department.

4. The final contracts, with original signatures, are presented to the Permits Manager for execution **provided ALL certificates and payments are received**.

5. Once the contract is executed, one original will be returned for your files.

6. Prior to commencing any work on the Premises, Licensee shall complete and shall require its contractor (all parties who will be working on the site) to complete the safety training



SCOEPA00010891

program at Internet Website *http://www.contractororientation.com*. This training must be completed no more than one year in advance of Licensee's entry on the Premises.

7. The cover letter for the executed contract will list the Roadmaster's name and phone number. **You will need to contact the Roadmaster five (5) days prior to beginning work.**

## Costs:

Average cost for an Environmental Access permit is $500.00 for sampling only and an additional $1,000.00 for installation of monitoring wells.

Please be advised the average time period for completion of this process is 45 to 60 days from the time that the application is received. Every effort will be made to complete this process in a timely manner.

## Insurance Requirements:

Licensee shall furnish to Staubach an acceptable certificate of insurance to reflect the following coverage has been secured:

- **Commercial General Liability Insurance**. Contractual liability with a combined single limit of a minimum of $1,000,000 each occurrence and an aggregate limit of at least $2,000,000.

- **Business Automobile Insurance**. Combined single limit of at least $1,000,000 per occurrence.

- **Workers Compensation and Employers Liability insurance** Employers' Liability with limits of at least $500,000 each accident, $500,000 by disease policy limit, $500,000 by disease each employee.

- **Railroad Protective Liability insurance** with coverage of at least $2,000,000 per occurrence and $6,000,000 in the aggregate.

- Severability of interest and naming Licensor and Staubach Global Services, Inc. as additional insureds shall be indicated on the certificate of insurance above (excluding Workers Compensation and if applicable, Railroad Protective).

**Please note:** These limits are subject to change at any time without notice. An Agreement will be provided to you which contains details concerning insurance requirements.



SCOEPA00010892

BNSF

# THE BURLINGTON NORTHERN AND SANTA FE RAILWAY COMPANY□

Return to : Staubach Global Services, Inc.
Attn: Permit Services
5650 N. Riverside Drive, Suite 101
Fort Worth, TX 76137

## APPLICATION FOR ENVIRONMENTAL ACCESS PERMIT

Name: NW Natural (Or Permit Holder) Date: November 14 20 01

State of Incorporation Oregon

Address: 220 NW 2nd Avenue
Portland, Oregon 97209

Contact Name: Mr. Robert Wyatt Tele: (503) 226-4211 x 5425

Station: Portland (Nearest City) County: Multnomah State: Oregon

Line Segment: _____ Milepost: _____
(If you have the above information, please complete.)

Is the work to be performed within 50 feet of a railroad track? _____ Yes XXXXX No

Total Cost of Project <$5,000

Percentage of project done within 50 feet of tracks: ZERO

How may feet from the track will the work be performed? 75 to 125

Area To Occupy: 4,000 Feet By 50 Feet

Purpose: To survey location/elevation of drainage ditch between BNSF rail line and Wacker Siltronic Corporation property (7200 NW Front Avenue). To obtain depth to water measurements from existing wells in same area on BNSF property. Wells are maintained by Rhone-Poulenc, Inc. See attached.

Time Period: December 7, 2001 (Date from) December 31, 2002 (Date to)

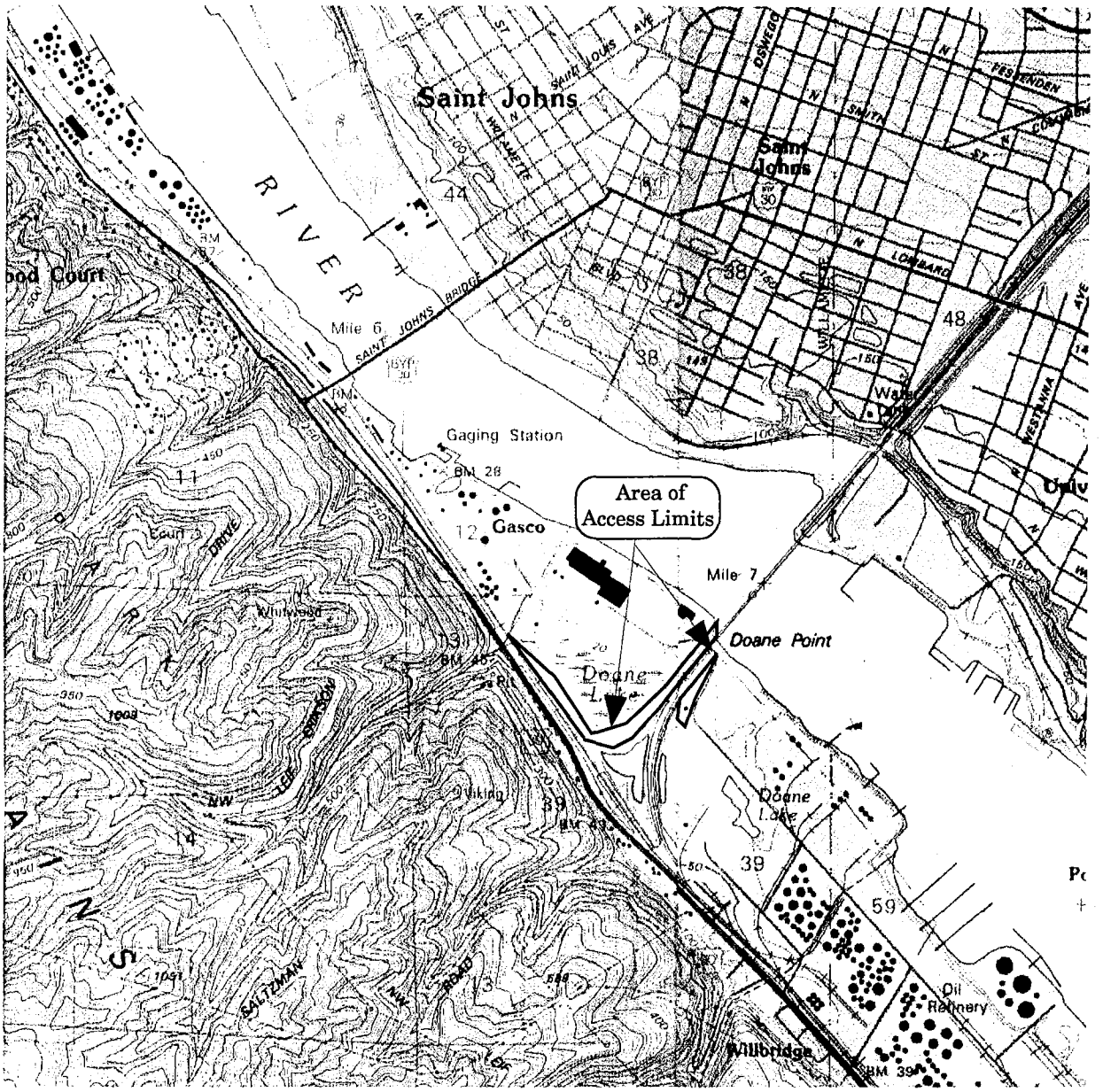
The cost of the Environmental Access permit is $500.00 for sampling purposes and $1,000.00 more for placement of monitoring wells, due when the Permit has been signed by the Permittee and is ready to be returned for execution. Also, Railroad Protective Insurance is required when work is within 50-feet of the track. This insurance will be offered when the Permit draft is sent. **APPLICANT IS REQUIRED TO PROVIDE COPY OF PROPOSED WORK PLAN.**

SIGNATURE: _____ PRINT NAME Robert J. Wyatt 11-6-01

TITLE: Environmental Compliance Specialist DATE:

If you would like a confirmation of receipt of your application e-mailed to you, please PRINTt your e-mail address:

_____




Note: Base Map from Linnton (1990) and Portland (1990), Oregon, USGS 7.5-Minute Quadrangles

| | | | |
|---|---|---|---|
| Project No. 5237<br>October 2001 | **HAHN AND ASSOCIATES**<br>**INCORPORATED**<br>ENVIRONMENTAL MANAGEMENT<br>434 NW SIXTH AVENUE, SUITE 203<br>PORTLAND, OREGON 97209<br>(503) 796-0717 | **LOCATION MAP**<br>BNSF Railway Environmental Access<br>Adjacent to 7200 NW Front Avenue<br>Portland, Oregon | **FIGURE**<br>**1** |

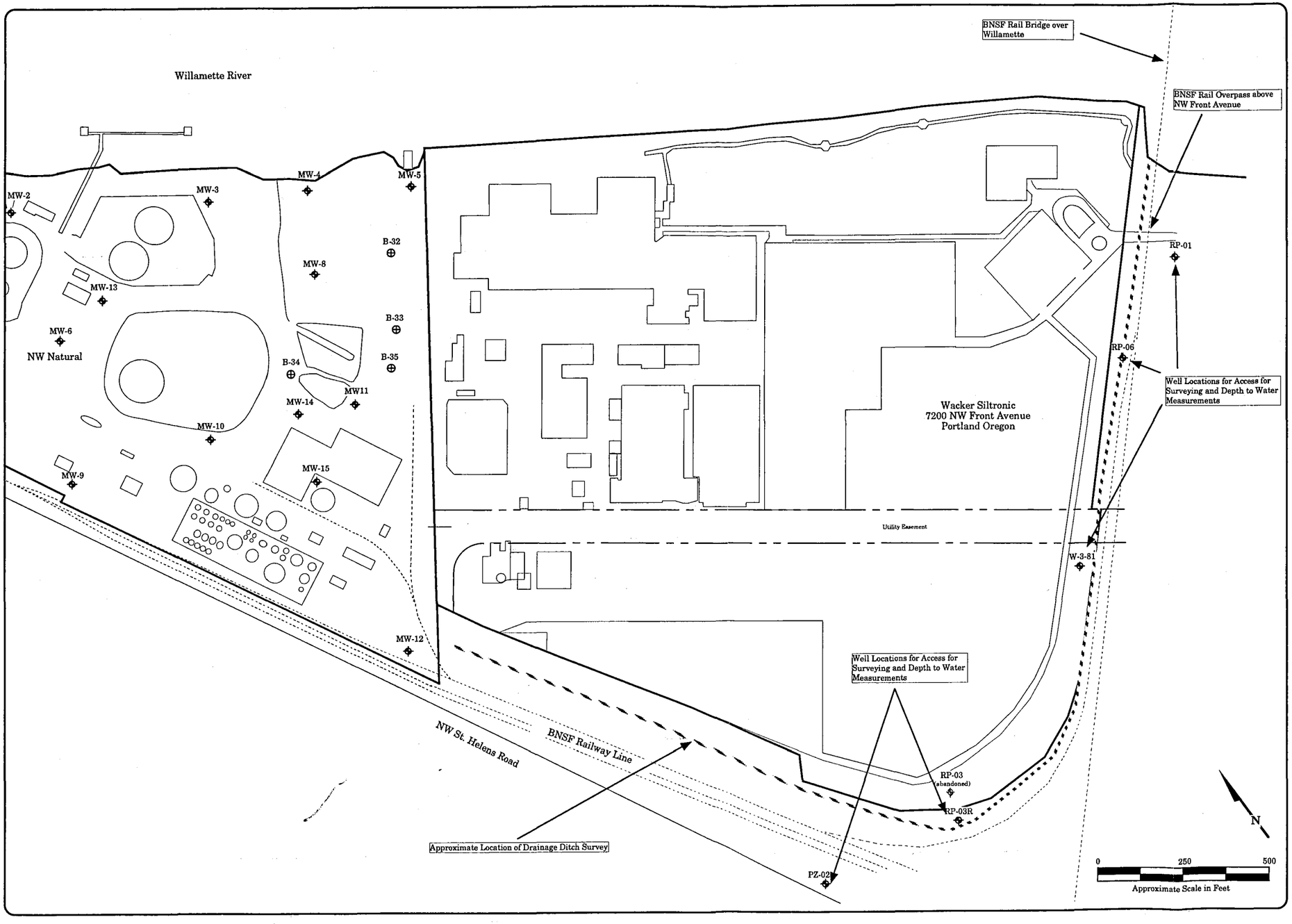



**Figure 2**

**BNSF Railway Environmental Access**

Property adjacent to:
7200 NW Front Avenue
Portland, Oregon

**HAHN & ASSOCIATES, INC.**
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717

**November 2001**

**Project No. 5237**

SCOEPA00010895

# FINAL
# FOCUSED
# REMEDIAL INVESTIGATION
# WORK PLAN

Wacker Siltronic Corporation Property
7200 NW Front Avenue
Portland, Oregon

June 1, 2001

Prepared for:

NW Natural
Portland, Oregon

Prepared by:

Hahn and Associates, Inc.
Portland, Oregon

HAI Project No. 5237

SCOEPA00010896

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G Focused Remedial Investigation Sampling and Analysis Plan, Wacker Siltronic Property
H Site Health and Safety Plan for Remedial Investigation, Wacker Siltronic Property




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with regard to groundwater elevation and flow direction, necessary for an evaluation of potential contaminant flux into the river.

Currently, it is anticipated that each of the five anticipated well clusters will consist of two wells, one screened within the Surficial Fill WBZ, and the second screened within the upper Alluvial Sand WBZ. This conceptual well installation plan will be modified, as necessary to meet the RI objectives, based on actual site conditions encountered during the push probe investigatory activities.

Groundwater samples collected from each of the monitoring wells will initially be analyzed for the full suite of COIs, as well as other parameters (i.e., cations and anions) that may be deemed helpful with regard to evaluating groundwater flux to the river.

### 9.2.4 Location and Elevation Survey / Off-Site Ditch Evaluation

Following installation of the monitoring wells, the locations and elevations of the new monitoring wells will be surveyed to the City of Portland datum by an Oregon Registered Professional Land Surveyor. The ground surface elevation will also be surveyed at each location. The top of casing elevations will measured to an accuracy of 0.01 feet, and the locations of the monitoring wells will be measured to an accuracy of 1.0 feet. The locations and ground surface elevations of all other soil borings, well points, and sampling points will also be surveyed.

Further, the location and elevation of the off-site drainage ditch present along the railroad right-of-way to the west and south of the site will be surveyed. Surface elevation measurements of the base of the ditch will be made along the length of the ditch adjacent to the Wacker property at approximate 500 foot intervals. At the time of the survey, the banks of the ditch will be visually inspected for the presence of groundwater seeps. Locations of seeps, if any, will be included within the survey.

### 9.2.5 Groundwater Monitoring

Monitoring of static water levels in the monitoring wells will be performed on a quarterly basis to gather information on seasonal fluctuations of the water table and hydraulic gradients. River stage data will also be collected at the same time to determine hydraulic continuity with the Willamette River. Water levels at the Wacker site will be collected synchronously with water level collection activities at the adjacent NW Natural site, as well as within Rhone-Poulenc wells RP-01, RP-03, and RP-06 (assuming access is provided to the Rhone-Poulenc wells), such that overall groundwater flow direction across the site can best be determined. Further, water levels within the Willamette River, as well as within select monitoring wells on the Wacker property, will undergo continuous monitoring for a period of at least 48 hours in order to evaluate tidal influences on the hydrogeologic system at Wacker. A specific proposal for this short term continuous monitoring event will be included as part of the groundwater monitoring plan, described below.



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**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL CONSULTANTS

November 15, 2001

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland, OR 97201-4987

HAI Project No. 5237

SUBJECT: October 2001 Progress Report for Remedial Investigation (RI) Activities, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. Blischke:

Hahn and Associates, Inc. (HAI) has prepared this Progress Report summarizing RI work activities that have occurred relating to the Wacker Siltronic Corporation (Wacker) property during the month of October 2001. RI field activities are being conducted as per the approved *Final Focused Remedial Investigation (RI) Work Plan*[1] (RI Work Plan) prepared for the site. This Progress Report has been prepared as per an Order (DEQ No. ECVC-NWR-00-27) issued jointly to both NW Natural and Wacker by the Oregon Department of Environmental Quality (ODEQ), dated October 4, 2000.

As per the referenced Order, monthly progress reports are to be prepared by the 15th day of each month, with the reporting to continue for the duration of the project. This is the thirteenth monthly Progress Report for this project.

**Summary of Activities in October 2001**

A Data Summary Package which includes boring logs, well construction logs, soil and groundwater analytical testing data related to push probe boring P-3 and the WS-8 series monitoring wells was submitted to the ODEQ in correspondence dated October 5, 2001 (Mr. Rob Ede to Mr. Eric Blischke). The Data Package was provided to facilitate the resolution of a contention from Wacker that well WS-8-59, a well that was installed by NW Natural on the Wacker property in September 2001, was not installed in accordance with protocols established within the ODEQ-approved RI Work Plan. As you may recall, Wacker's contention regarding inappropriate well design was expressed in correspondence dated September 25, 2001 (Mr. Christopher Reive to Mr. Dick Bach).

Due to the above issue, and as previously described in correspondence dated October 9, 2001 (Mr. Rob Ede to Mr. Eric Blischke), Wacker has refused NW Natural property access with regard to installation of the WS-10 series wells. The WS-10 series wells were originally proposed for installation during the week of September 12, 2001 up-gradient of the WS-8

[1] Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1, 2001.

series wells in the immediate vicinity of the former trichloroethene (TCE) spill / soil removal area.

To account for the delay associated with loss of site access, a 60-day extension for completion of fieldwork was granted by the ODEQ in correspondence dated October 23, 2001 (Blischke to Wyatt). This 60-day extension moves the target completion date for RI field activities to December 24, 2001, from the originally scheduled completion date of October 24, 2001.

Sampling activities associated with the three monitoring wells installed on September 2001 at the Wacker property (WS-8-33, WS-8-59, and WS-9-34) were conducted by HAI on October 8 and 9, 2001. These sampling activities were conducted synchronously with sampling activities conducted at the adjacent NW Natural property. Although proposed in the Work Plan, water levels from select Rhone-Poulenc wells were not collected during the initial sampling event at Wacker since access to these wells had not yet been received from the well owner (Rhone-Poulenc) or the right-of-way owner (Burlington Northern Santa Fe Railroad). Otherwise, all sampling activities were conducted in accordance with the ODEQ-approved RI Work Plan. Additionally, locations and elevations of push probe borings and newly constructed monitoring wells at Wacker were surveyed by NW Natural surveyors on October 9, 2001.

**Anticipated Activities in November and December 2001**

As required by ODEQ Order No. ECVC-NWR-00-27, as modified within correspondence dated October 23, 2001 (Mr. Eric Blischke to Mr. Bob Wyatt), site characterization activities are to be completed 120 days from receipt of Work Plan approval, with a 60-day extension. With approval of the RI Work Plan by the ODEQ on June 26, 2001, this equates to a field work completion date of December 24, 2001.

Remaining RI activities to be completed at the site include: 1) installation of the WS-10 series monitoring wells; 2) completion of aquifer slug tests on select newly installed monitoring wells; 3) development and implementation of a plan for conducting a continuous short-term (48 hours) groundwater elevation monitoring event; 4) development of a long-term (1 year) quarterly monitoring plan for newly installed monitoring wells at the Wacker site; and 5) an inspection and survey of the base of the drainage ditch located immediately west and south of the Wacker property.

Completion of Tasks 1 through 4 above are contingent upon receipt of Wacker access for the installation of the WS-10 series monitoring wells. Timing with regard to receipt of site access is unknown at this time, however soil boring and monitoring well construction information requested by Wacker in an effort to resolve the access issue were provided in a Data Summary Package dated October 5, 2001, a copy of which was provided to Wacker. Completion of Task 5 above will require receipt of access approval from the Burlington Northern and Santa Fe Railroad Company, the owner of the right-of-way through which the ditch runs. This access has not yet been received.



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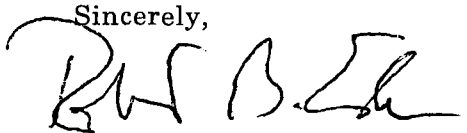
Once the remaining WS-10 series wells are installed at the Wacker property, then slug testing will be conducted and a plan for continuous short-term water level testing, as well as long term (1 year) groundwater monitoring, will be submitted to the ODEQ. Actions necessary to obtain access to key off-site wells for long-term groundwater elevation monitoring are underway with Rhone-Poulenc, Inc. and with the Burlington Northern Santa Fe Railroad Company.

In the meantime, it is anticipated that a Data Package containing boring logs and well construction details, as well as a summary of all available soil, groundwater, and surface water data, will be available for submittal to the ODEQ in November 2001. A Data Package summarizing results of the October 2001 sampling of the WS-8 and WS-9 series wells was provided to ODEQ in correspondence dated November 6, 2001 (Mr. Rob Ede to Mr. Eric Blischke). Finally, the next groundwater sampling event at Wacker (second quarterly event) is scheduled for completion in December 2001.

Depending on the timing for receipt of access from Wacker, as well as from the Burlington Northern Railroad, and Rhone Poulenc, Inc., it is possible that an additional extension for completion of RI field activities will be needed.

If the foregoing report is acceptable to the ODEQ, there is no need to respond.

Sincerely,



Robert Ede, R.G.
Associate

rede@hahnasoc.com

c: Mr. Bob Wyatt, NW Natural
Mr. Richard Bach, Stoel Rives LLP
Mr. Carl Stivers, Anchor Environmental, L.L.C.
Ms. Cathryn Young, Wacker Siltronic Corporation



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**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL CONSULTANTS

November 6, 2001

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland OR 97201-4987

HAI Project No. 5237

SUBJECT: Data Summary – WS-8 cluster and WS-9-34 wells, Focused Remedial Investigation, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. Blischke:

On behalf of NW Natural, Hahn and Associates, Inc. (HAI) is submitting the enclosed summary of groundwater quality data resulting from the October 2001 sampling of monitoring wells WS-8-33, WS-8-59, and WS-9-34, all installed by NW Natural at the referenced property in mid-September. All sampling activities were conducted in accordance with the Oregon Department of Environmental Quality-approved *Final Focused Remedial Investigation Work Plan*[1] .

As indicated by the enclosed data, analytical results of groundwater samples collected from monitoring wells WS-8-33, WS-8-59, and WS-9-34 correlate closely with previously submitted (Ede to Blischke, October 5, 2001) analytical results of groundwater samples collected from temporary well points installed at the same locations (borings P-3 and P-5) in August 2001. The preceding correlation suggests that all groundwater data resulting from the August push probe borings are likely highly representative of actual groundwater conditions across the riverfront portion of the site.

With the availability of the enclosed data, NW Natural at this time is looking forward to written concurrence from the ODEQ that all monitoring well construction work associated with wells WS-8-33, WS-8-59, and WS-9-34 was completed in accordance with the above-referenced ODEQ-approved RI Work Plan.

Please call me at 503-796-0717 should you have any questions or wish to discuss the enclosed data summary.

Sincerely,

Robert Ede, R.G.
Associate
rede@hahnasoc.com

[1] Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1, 2001.



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c: Mr. Bob Wyatt, NW Natural
Mr. Richard Bach, Stoel Rives LLP
Mr. Carl Stivers, Anchor Environmental, LLC
Ms. Cathryn Young, Wacker Siltronic Corporation



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**TABLE 1**
**Summary of Analytical Results for Groundwater Samples: Monitoring Wells**
**Detected Volatile Organic Compounds by EPA Method 8260**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Well Number | HAI Sample Number | Sample Date | Screen Interval | Analytical Results – ug/l (ppb) VOCs by EPA Method 8260 | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Aromatic VOCs (AVOCs) | | | | | | | | | Halogenated VOCs (HVOCs) | | | | | | | |
| | | | (feet bgs) | Benzene | Ethylbenzene | Toluene | Xylene | Naphthalene | Chlorobenzene | 1,2-DCB | 1,3-DCB | 1,4-DCB | 1,1-DCE | cis-1,2-DCE | trans-1,2-DCE | TCE | Vinyl Chloride | Other VOCs | Total AVOCs | Total HVOCs |
| WS-8-33 | 5237-011009-107 | 9-Oct-01 | 23-33 | **107.** | 27.9 | ND> 10. | ND> 20. | **841.** | ND> 10. | ND> 10. | ND> 10. | ND> 10. | ND> 10. | ND> 10. | ND> 10. | ND> 10. | ND> 12. | 1,2,4-TMB = 18.8 | 994.7 | ND |
| WS-8-59 | 5237-011008-104 | 8-Oct-01 | 49-59 | 14.7 | ND> 1. | ND> 1. | ND> 2. | 38.9 | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | 251. | ND> 1. | ND> 1. | 92.4 | ND | 53.6 | 343.4 |
| (duplicate) | 5237-011008-105 | | | 21.4 | ND> 1. | 2.02 | ND> 2. | 49.9 | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | 345. | ND> 1. | ND> 1. | 129. | ND | 73.3 | 474. |
| WS-9-34 | 5237-011008-102 | 8-Oct-01 | 24-34 | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 5. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| Quality Control Samples | | | | | | | | | | | | | | | | | | | | |
| Trip Blank | 5237-011008-101 | 8-Oct-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 5. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| Water EB | 5237-011008-103 | 8-Oct-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 5. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | acetone = 149 | 149. | ND |
| Trip Blank | 5237-011009-106 | 9-Oct-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 2. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND | ND |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | 71. [3] | 29,000. [3] | 200,000. [3] | # | 620. [4] | 21,000. [3] | 17,000. [3] | 2,600. [3] | 2,600. [3] | # | 11,600. [4] | 140,000. [3] | 81. [2] | 525. [3] | # | # | # |

Note:
# = not established
AVOCs = aromatic volatile organic compounds
bgs = below ground surface
DCB = dichlorobenzene
DCE = dichloroethene
EB = equipment blank
EPA = U.S. Environmental Protection Agency
HVOCs = halogenated volatile organic compounds
ND = not detected above detection limit indicated
ppb = parts per billion
TCE = trichloroethene
TMB = trimethylbenzene
ug/l = micrograms/liter
VOCs = volatile organic compounds

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC
4 = Reference Level based on Lowest Observable Health Effect Level for Freshwater, as provided within NOAA Screening Quick Reference Tables, updated September 1999
**Bold** = Detected above lowest identified AWQC



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**TABLE 2**
**Summary of Preliminary Analytical Results for Groundwater Samples: Monitoring Wells**
**Polynuclear Aromatic Hydrocarbons by EPA Method 8270 SIM**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| PAHs by EPA Method 8270 (SIM) | | | | Analytical Results ug/l (ppb) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Carcinogenic PAHs | | | | | | | Non-carcinogenic PAHs | | | | | | | | | |
| Well Number | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Benzo (a) anthracene | Benzo (b) fluoranthene | Benzo (k) fluoranthene | Benzo (a) pyrene | Chrysene | Dibenzo (ah) anthracene | Indeno (1,2,3-cd) pyrene | Acenaphthene | Acenaphthylene | Anthracene | Benzo (ghi) perylene | Fluoranthene | Fluorene | Naphthalene | Phenanthrene | Pyrene | Total PAHs |
| WS-8-33 | 5237-011009-107 | 9-Oct-01 | 23-33 | **0.55** | **0.19** | ND> 0.1 | **0.27** | **0.6** | ND> 0.1 | 0.11 | 98.7 | 1.17 | 8.42 | 0.15 | 7.83 | 32.5 | 485. | 85. | 7.65 | 728.1 |
| WS-8-59 | 5237-011008-104 | 8-Oct-01 | 49-59 | **0.25** | ND> 0.1 | ND> 0.1 | ND> 0.1 | **0.29** | ND> 0.1 | ND> 0.1 | 18.5 | 0.38 | 4.2 | ND> 0.1 | 5.8 | 7.9 | 22.7 | 31.8 | 6.4 | 98.2 |
| (duplicate) | 5237-011008-105 | | | **0.2** | ND> 0.1 | ND> 0.1 | ND> 0.1 | **0.24** | ND> 0.1 | ND> 0.1 | 18.9 | 0.39 | 4.1 | ND> 0.1 | 5.5 | 7.9 | 22.5 | 29.8 | 6.3 | 95.8 |
| WS-9-34 | 5237-011008-102 | 8-Oct-01 | 24-34 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | 2.07 | 0.15 | ND> 0.1 | ND> 0.1 | 0.36 | 0.18 | 0.45 | ND> 0.1 | 0.38 | 3.6 |
| Quality Control Samples | | | | | | | | | | | | | | | | | | | | |
| Trip Blank | 5237-011008-101 | 8-Oct-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND |
| Water EB | 5237-011008-103 | 8-Oct-01 | NA | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND> 0.1 | ND |
| Trip Blank | 5237-011009-106 | 9-Oct-01 | NA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | 0.049 [3] | 0.049 [3] | 0.049 [3] | 0.049 [3] | 0.049 [3] | 0.049 [3] | 0.049 [3] | 2,700. [2] | # | 110,000. [3] | # | 370. [3] | 14,000. [3] | 620. [4] | # | 11,000. [3] | # |

Note:
# = not established
bgs = below ground surface
EB = equipment blank
EPA = U.S. Environmental Protection Agency
ND = not detected above detection limit indicated
PAHs = polynuclear aromatic hydrocarbons
ppb = parts per billion
ug/l = micrograms per liter

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC
4 = Reference Level based on Lowest Observable Health Effect Level for Freshwater, as provided within NOAA Screening Quick Reference Tables, updated September 1999
**Bold** = Detected above lowest identified AWQC

**TABLE 3**
**Summary of Preliminary Analytical Results for Groundwater Samples: Monitoring Wells**
**Detected Semi-Volatile Organic Compounds by EPA Method 8270C**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| SVOCs by EPA Method 8270 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Well Number | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Carbazole | Dibenzofuran | 2-Methylnaphthalene | PAHs |
| WS-8-33 | 5237-011009-107 | 9-Oct-01 | 23-33 | 14.7 | 4.26 | 59.2 | See Table 2 |
| WS-8-59 | 5237-011008-104 | 8-Oct-01 | 49-59 | ND> 4. | ND> 2. | 6.74 | See Table 2 |
| (duplicate) | 5237-011008-105 | | | ND> 4. | ND> 2. | 7.17 | See Table 2 |
| WS-9-34 | 5237-011008-102 | 8-Oct-01 | 24-34 | ND> 4. | ND> 2. | ND> 2. | See Table 2 |
| Quality Control Samples | | | | | | | |
| Trip Blank | 5237-011008-101 | 8-Oct-01 | NA | - | - | - | See Table 2 |
| Water EB | 5237-011008-103 | 8-Oct-01 | NA | ND> 4. | ND> 2. | ND> 2. | See Table 2 |
| Trip Blank | 5237-011009-106 | 9-Oct-01 | NA | - | - | - | See Table 2 |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | # | # | # | # |

Note:

bgs = below ground surface
EB = equipment blank
EPA = U.S. Environmental Protection Agency
ND = Not detected above detection limit indicated

1 = Ambient Water Quality Criteria (EPA 822-Z-99-001)

PAHs = polynuclear aromatic hydrocarbons
ppb = parts per billion
ug/l = micrograms/liter
# = not established



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**TABLE 4**
**Summary of Preliminary Analytical Results for Groundwater Samples: Monitoring Wells**
**Metals and Cyanide**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

| Well Number | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Analytical Results – mg/l (ppm) Total Metals by EPA Methods 6010, 200.7 and/or 7000 Series | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Antimony | Arsenic | Barium | Cadmium | Chromium | Cobalt | Copper | Iron | Lead |
| WS-8-33 | 5237-011009-107 | 9-Oct-01 | 23-33 | ND> 0.003 | **0.0063** | 0.184 | ND> 0.001 | 0.0069 | 0.0041 | **0.0264** | 117. | **0.0082** |
| WS-8-59 | 5237-011008-104 | 8-Oct-01 | 49-59 | ND> 0.003 | ND> 0.005 | 0.153 | ND> 0.001 | ND> 0.005 | ND> 0.001 | 0.0055 | 49.6 | ND> 0.005 |
| (duplicate) | 5237-011008-105 | | | ND> 0.003 | ND> 0.005 | 0.142 | ND> 0.001 | ND> 0.005 | ND> 0.001 | 0.0037 | 47. | ND> 0.005 |
| WS-9-34 | 5237-011008-102 | 8-Oct-01 | 24-34 | ND> 0.003 | ND> 0.005 | 0.246 | ND> 0.001 | ND> 0.005 | 0.0281 | 0.0074 | 33.9 | ND> 0.005 |
| Quality Control Samples | | | | | | | | | | | | |
| Trip Blank | 5237-011008-101 | 8-Oct-01 | NA | - | - | - | - | - | - | - | - | - |
| Water EB | 5237-011008-103 | 8-Oct-01 | NA | ND> 0.003 | ND> 0.005 | ND> 0.005 | ND> 0.001 | ND> 0.005 | ND> 0.001 | ND> 0.001 | 0.0417 | ND> 0.005 |
| Trip Blank | 5237-011009-106 | 9-Oct-01 | NA | - | - | - | - | - | - | - | - | - |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | 4.3 [3] | 0.00014 [3] | # | 0.002 [2] | 0.011 [2] | # | 0.009 [2] | # | 0.003 [2] |

Note: # = not established
bgs = below ground surface
EB = equipment blank
EPA = U.S. Environmental Protection Agency
mg/l = milligrams/liter
ND = not detected above detection limit indicated
ppm = parts per million

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC

**Bold** = Detected above lowest identified AWQC

**TABLE 4**
**Summary of Preliminary Analytical Results for Groundwater Samples: Monitoring Wells**
**Metals and Cyanide**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Well Number | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Analytical Results – mg/l (ppm) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Total Metals by EPA Methods 6010, 200.7 and/or 7000 Series | | | | | | | | EPA Method 335.2 | SM 4500 |
| | | | | Magnesium | Manganese | Nickel | Selenium | Silver | Titanium | Vanadium | Zinc | Total Cyanide | Amenable Cyanide |
| WS-8-33 | 5237-011009-107 | 9-Oct-01 | 23-33 | 27.2 | 5.07 | 0.0039 | ND> 0.005 | ND> 0.0019 | 0.766 | 0.0397 | 0.0496 | ND> 0.02 | ND> 0.02 |
| WS-8-59 | 5237-011008-104 | 8-Oct-01 | 49-59 | ND> 0.05 | 2.85 | ND> 0.003 | ND> 0.005 | ND> 0.0019 | 0.564 | 0.0233 | 0.0307 | **0.468** | ND> 0.02 |
| (duplicate) | 5237-011008-105 | | | ND> 0.05 | 2.84 | ND> 0.003 | ND> 0.005 | ND> 0.0019 | 0.448 | 0.0173 | 0.0236 | **0.456** | ND> 0.02 |
| WS-9-34 | 5237-011008-102 | 8-Oct-01 | 24-34 | 53.3 | 4.31 | ND> 0.003 | ND> 0.005 | ND> 0.0019 | 0.0055 | ND> 0.001 | 0.0055 | **0.14** | ND> 0.02 |
| Quality Control Samples | | | | | | | | | | | | | |
| Trip Blank | 5237-011008-101 | 8-Oct-01 | NA | - | - | - | - | - | - | - | - | - | - |
| Water EB | 5237-011008-103 | 8-Oct-01 | NA | 0.0775 | ND> 0.005 | ND> 0.003 | ND> 0.005 | ND> 0.0019 | ND> 0.001 | ND> 0.005 | ND> 0.005 | ND> 0.02 | - |
| Trip Blank | 5237-011009-106 | 9-Oct-01 | NA | - | - | - | - | - | - | - | - | - | - |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | # | # | 0.052 [2] | 0.005 [2] | 0.003 [2] | # | # | 0.12 [2] | 0.005 [2] | |

Note: # = not established
bgs = below ground surface
EB = equipment blank
EPA = U.S. Environmental Protection Agency
mg/l = milligrams/liter
ND = not detected above detection limit indicated
ppm = parts per million

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC

**Bold** = Detected above lowest identified AWQC

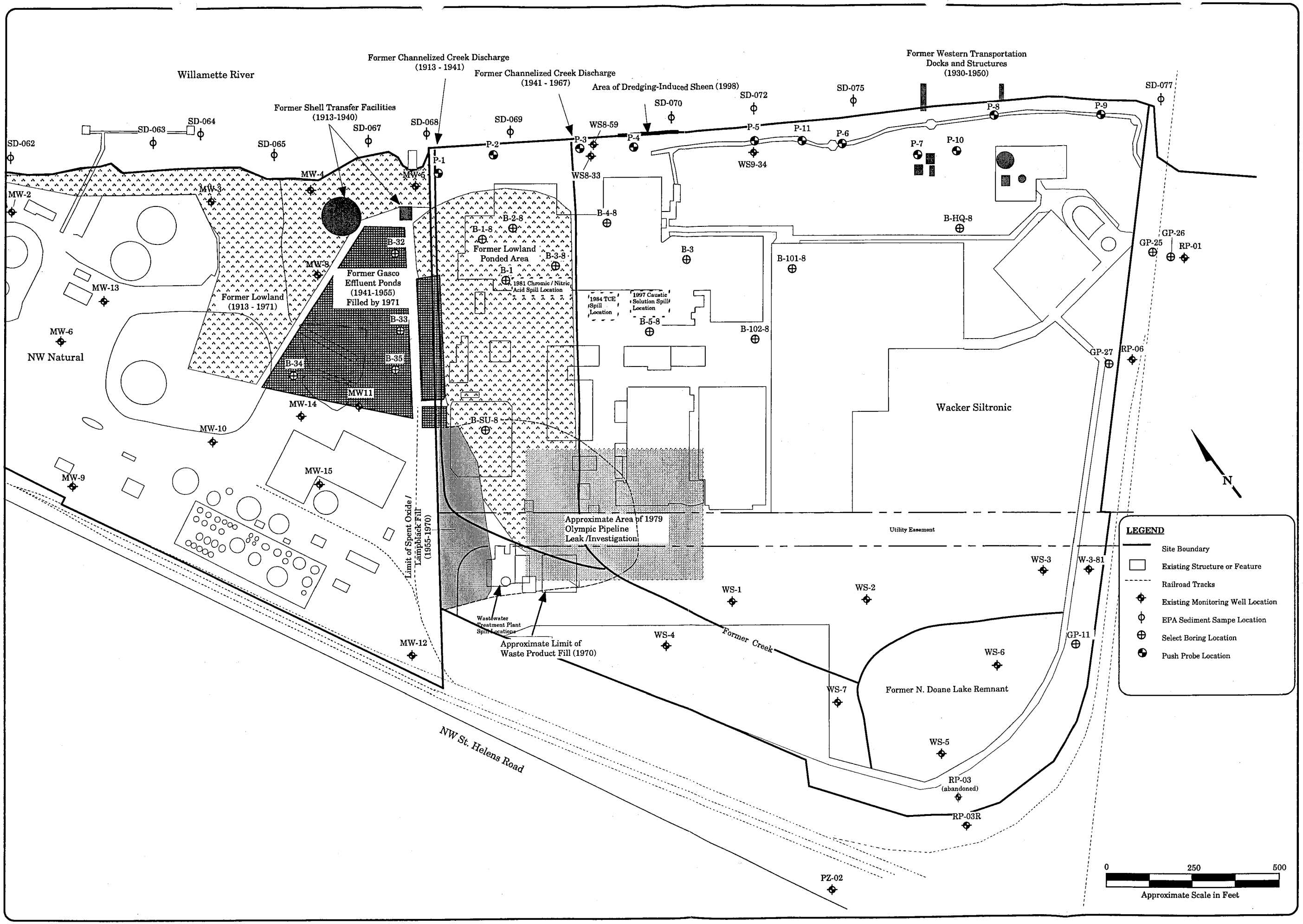


**Figure 1**

**Monitoring Well and Push Probe Location Map**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon


**HAHN & ASSOCIATES, INC.**
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717


**August 2001**

**Project No. 5237**

SCOEPA00010911

Oregon
John A. Kitzhaber, M.D., Governor

Department of Environmental Quality
Northwest Region
2020 SW Fourth Avenue
Suite 400
Portland, OR 97201-4987
(503) 229-5263 Voice
TTY (503) 229-5471

October 23, 2001

Mr. Bob Wyatt
Northwest Natural
220 NW Second Avenue
Portland, OR 97209

Re: Upgradient Monitoring Well Installation
Wacker Siltronic Corporation Property

Dear Bob:

As you are aware, due to site access and drill rig accessibility issues, the two upgradient monitoring wells at the Wacker Siltronic Corporation Property (Wacker) site could not be installed during the Phase I Remedial Investigation (RI) as expected. As a result, RI characterization activities will not be completed before October 24, 2001 as required under the terms of the Oregon Department of Environmental Quality (DEQ) Order No. ECVC-NWR-00-27 issued jointly to Northwest Natural and Wacker Siltronic Corporation. However, given the extenuating circumstances, DEQ grants a 60-day extension for the installation, development, and sampling of the upgradient monitoring wells.

Upon review of the groundwater data received to date, DEQ believes that it is appropriate to install the upgradient monitoring wells at a location near or downgradient from known or suspected sources of petroleum contamination. DEQ recommends installing the upgradient monitoring wells in the vicinity of the former channelized creek and former ponded lowland area. DEQ acknowledges the physical constraints on monitoring well locations resulting from operations and structures at the Wacker site. DEQ recommends a meeting between DEQ and representatives of Wacker Siltronic Corporation and Northwest Natural at the Wacker site to finalize monitoring well locations.

Please contact me once you have returned from vacation at (503) 229-5648 to schedule a meeting time or if you have any questions regarding this matter.

Sincerely,

Eric L. Blischke
Project Manager
Voluntary Cleanup and Portland Harbor Section



SCOEPA00010912

cc: Mike Rosen, NWR/DEQ
Rod Struck, NWR/DEQ
Angie Obery, WR/DEQ (Eugene)
Cathryn Young, Wacker Siltronic Corporation

**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL CONSULTANTS

October 15, 2001

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland OR 97201-4987

HAI Project No. 5237

SUBJECT: September 2001 Progress Report for Remedial Investigation (RI) Activities, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. Blischke:

Hahn and Associates, Inc. (HAI) has prepared this Progress Report summarizing RI work activities that have occurred relating to the Wacker Siltronic Corporation (Wacker) property during the month of September 2001. RI field activities are being conducted as per the approved *Final Focused Remedial Investigation (RI) Work Plan*[1] prepared for the site. This Progress Report has been prepared as per an Order (DEQ No. ECVC-NWR-00-27) issued jointly to both NW Natural and Wacker by the Oregon Department of Environmental Quality (ODEQ), dated October 4, 2000.

As per the referenced Order, monthly progress reports are to be prepared by the 15th day of each month, with the reporting to continue for the duration of the project. This is the twelfth monthly Progress Report for this project.

**Summary of Activities in September 2001**

With the completion of groundwater and soil sampling activities associated with the push probe boring component of the RI in August, and the receipt of analytical results from this investigation in early September, a meeting with representatives of NW Natural and the ODEQ was conducted on September 7, 2001 such that locations and depths of proposed monitoring wells could be agreed upon. Expedited ODEQ approval of proposed monitoring well locations was provided via this meeting in order to facilitate completion of well installation activities during the week of September 10, 2001, a time-frame requested by Wacker since it would coincide with a shut-down of Wacker's crystal growing plant. As agreed in the meeting, five monitoring wells would be constructed at the Wacker site at locations depicted on Figure 1. Of these five wells, three (WS-8-33, WS-8-59, and WS-9-34) were to be constructed along the riverfront, while two (WS-10 series wells) were to be constructed up-gradient of the WS-8 series wells in the immediate vicinity of the former trichloroethene (TCE) spill / soil removal area.

---

[1] Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1, 2001.

Monitoring wells WS-8-33 and WS-8-59 were installed on September 12, while well WS-9-34 was installed on September 13, 2001. As previously described in correspondence dated October 9, 2001 (Ede to Blischke), Wacker refused NW Natural access with regard to installation of the WS-10 series wells. Wells WS-8-33, WS-8-59, and WS-9-34 underwent development with a submersible pump on September 19, 2001.

**Anticipated Activities in and October and November 2001**

As required by ODEQ Order No. ECVC-NWR-00-27, site characterization activities are to be completed 120 days from receipt of Work Plan approval. With approval of the RI Work Plan by the ODEQ on June 26, 2001, this equates to a field work completion date of October 24, 2001.

The initial round of water level measurements and groundwater sampling activities from the WS-8 and WS-9 series wells were completed on October 8 and October 9, 2001. This sampling event was conducted such that it coincided with water level measurements and sampling activities at the adjacent Gasco site. Although proposed in the Work Plan, water levels from select Rhone-Poulenc wells was not conducted during the initial sampling event at Wacker since access to these wells had not yet been received from the well owner (Rhone-Poulenc) or the right-of-way owner (Burlington Northern Railroad).

Remaining RI activities to be completed at the site include: 1) installation of the WS-10 series monitoring wells; 2) completion of aquifer slug tests on select newly installed monitoring wells; 3) development and implementation of a plan for conducting a continuous short-term (48 hours) groundwater elevation monitoring event; 4) development of a long-term (1 year) quarterly monitoring plan for newly installed monitoring wells at the Wacker site; and 5) an inspection and survey of the base of the drainage ditch located immediately west and south of the Wacker property.

Completion of Tasks 1 through 4 above are contingent upon receipt of Wacker access for the installation of the WS-10 series monitoring wells. Timing with regard to receipt of site access is unknown at this time, however soil boring and monitoring well construction information requested by Wacker in an effort to resolve the access issue were provided in a Data Summary Package dated October 5, 2001, a copy of which was provided to Wacker. Completion of Task 5 above will require receipt of access approval from Burlington Northern Railroad, the owner of the right-of-way through which the ditch runs. This access has not yet been received.

Once the remaining WS-10 series wells are installed at the Wacker property, then slug testing will be conducted and a plan for continuous short-term water level testing, as well as long term (1 year) groundwater monitoring, will be submitted to the ODEQ.

The delay in obtaining access to the Wacker property will preclude NW Natural from meeting the October 24, 2001 deadline for completion of RI Field activities. Under these circumstances, and as previously requested in correspondence dated October 9, 2001 (Ede to Blischke), it is respectfully requested that deadlines be extended as necessary to



SCOEPA00010915

compensate for these delays. In the meantime, it is anticipated that a Data Package containing boring logs and well construction details, as well as a summary of all available soil, groundwater, and surface water data, will be available for submittal to the ODEQ by October 19, 2001.

If the foregoing report is acceptable to the ODEQ, there is no need to respond.

Sincerely,

Robert Ede, R.G.
Sr. Project Manager

rede@hahnasoc.com

c: Mr. Bob Wyatt, NW Natural
Mr. Richard Bach, Stoel Rives LLP
Mr. Carl Stivers, Anchor Environmental, L.L.C.
Ms. Cathryn Young, Wacker Siltronic Corporation



SCOEPA00010916

**********
*** TX REPORT ***
**********

TRANSMISSION OK

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| TX/RX NO | 3058 |
| CONNECTION TEL | 95035987373 |
| CONNECTION ID | |
| ST. TIME | 10/19 14:04 |
| USAGE T | 00'34 |
| PGS. SENT | 4 |
| RESULT | OK |

**Wacker Siltronic Corporation**

7200 NW Front Avenue
Portland, Oregon 97210
Phone: (503) 243-2020
Fax: (503) 219-7599 Central Engineering

# FACSIMILE TRANSMITTAL SHEET

**TO:** **Chris Reive**
**Jordan Schrader**

**FROM:** **Cathryn Young**

**FAX No:** **(503) 598-7373**

**DATE:** **October 19, 2001**

**NUMBER OF PAGES (including this page): 4**

**MESSAGE/SPECIAL INSTRUCTIONS:**

Re: Northwest Natural

Hahn and Associates September 2001 Progress Report follows.

**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL CONSULTANTS

October 5, 2001

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland OR 97201-4987

HAI Project No. 5237

SUBJECT: Data Summary Package - Boring P-3 and WS-8 Well Cluster Location, Focused Remedial Investigation (RI) Activities; Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. Blischke:

As we discussed during our meeting of October 2, 2001, attached please find a Data Summary Package which includes boring logs, well construction details, soil and groundwater analytical testing data related to push probe boring P-3 and the WS-8 series monitoring wells. These borings / wells were recently installed on the Wacker Siltronic Corporation (Wacker) property as part of ongoing Remedial Investigation (RI) activities being conducted by NW Natural as provided within the Oregon Department of Environmental Quality-approved *Final Focused Remedial Investigation Work Plan*[1] (RI Work Plan). Analytical data and logs for other borings installed at the Wacker site will be included within a forthcoming RI Progress Report.

As you are aware, in correspondence dated September 25, 2001 (Mr. Christopher Reive to Mr. Dick Bach), Wacker raised concerns regarding the appropriateness of well construction/design for well WS-8-59, a well that was installed at the Wacker property on September 12, 2001 and was developed on September 19, 2001. As we agreed during our meeting, and for the reasons summarized below, these concerns are unfounded.

The purpose of this Data Package is to provide information to support our contention that well WS-8-59 was properly installed. The dissemination of this information is especially important since Wacker's environmental consultant (Limno-Tech, Inc.) was not present during the collection of lithologic or contaminant field-screening data from P-3, the exploratory boring installed on August 20, 2001 at the WS-8 location. Contaminant field screening and lithological data from the P-3 boring were used to determine well construction methodology and design for wells WS-8-33 and WS-8-59, both installed within approximately 10 feet of this boring.

To summarize, Wacker's contention, as expressed within the referenced letter of September 25, 2001, is that well WS-8-59 was installed in a manner that violated the ODEQ-approved RI Work Plan. Specifically, Wacker contends that a permanent large diameter surface casing should have been installed through the zone of impacted soil and into the

[1] Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1, 2001.

underlying silt unit. Because a surficial casing was not installed at the WS-8-59 well location, Wacker contends that contaminants could be carried downward from the Surficial Sand water-bearing zone (WBZ), through the semi-confining silt layer, and into the "previously unimpacted" Alluvial Sand WBZ. As a result, Wacker has requested that well WS-8-59 be replaced and has denied access to NW Natural for the purpose of installing the WS-10-series wells, to be constructed up-gradient of the WS-8 well cluster location.

The approved RI Work Plan provides specific criteria to be used in determining whether a monitoring well should be installed with permanent large diameter surface casing. These criteria are summarized as follows:

- If a well is to be installed through oil product or dense non-aqueous phase liquid (DNAPL)

AND

- The well will extend through a silt confining unit into an underlying zone with no known contamination.

The intent of the preceding criteria is to provide an additional safeguard to prevent the mobilization of oil product or DNAPL from one water-bearing zone to another during the well installation process.

As is evident based on review of the attached boring logs / data, the preceding criteria did not indicate use of a large diameter surface casing at well WS-8-59 was required, nor would its use be technically justified. A review of the attached boring logs and data indicate the following:

- Discolored soil with a petroleum odor was found to be present as shallow as 13 feet below ground surface (bgs) at push probe boring P-3, with patchy discontinuous zones of discoloration and odor extending through the Surficial Fill WBZ to the top of the Silt Unit, encountered at a depth of 32.5 feet bgs. Although sheens were observed by the sheen test (dropping disaggregated soil into water) no visible oil product was observed on any soil. The Silt Unit separates the Surficial Fill WBZ from the underlying Alluvial Sand WBZ. Although stained soils were present above the Silt Unit, no oil product, tar, or DNAPL, were identified above the Silt Unit at P-3.

- Groundwater quality data collected from push probe boring P-3 identified the presence of 104 parts per billion (ppb) benzene and 933 ppb naphthalene within the Surficial Fill WBZ, while lesser concentrations were identified within the underlying Alluvial Sand WBZ. The solubility limits for benzene and naphthalene in water (at 25° C) are 1,780,000 ppb and 31,700 ppb, respectively. The maximum benzene and naphthalene concentrations identified at P-3 represent approximately 0.006% and 3%, respectively, of the solubility limit for these compounds. Had oil product been present in the immediate vicinity of the P-3 / WS-8-59 location, then concentrations of these constituents would have been identified

at concentrations closer to their solubility limits, with 10% being a general minimum cut-off for considering the possibility of nearby oil product or DNAPL.

- The Wacker correspondence references the apparent generation of stained soil cuttings to a depth of 50 feet bgs during the installation of well WS-50. Wacker appears to be placing significance on the fact that stained drill cuttings may have been generated to this depth.

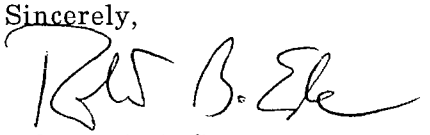
  The generation of stained drill cuttings while advancing the augers across a depth interval of 18.5 to 50 feet bgs during the installation of well WS-8-59 is not unusual since stained soils were found to extend from 13 feet to 32.5 feet bgs at the P-3 location. Due to the delay resulting from the need for soils to work their way up the auger flights as the augers advance in depth, stained soils encountered at 32 feet bgs could reasonably be expected to reach the surface by the time the augers had advanced to 50 feet bgs or even deeper, depending on drilling conditions. Therefore, it does not appear reasonable to conclude that stained soils were actually generated at depths greater than 32 feet bgs.

- The correspondence also implies significance to a silt layer that was encountered in the 55 to 60 foot depth range. It is noted that although the Alluvial Sand WBZ is typically predominantly composed of sand, silt layers of variable thicknesses and depths are present within this unit. These silt layers have not been found to be continuous across the study area, nor have they been identified as significant confining or semi-confining layers. The presence of these silt layers within a screened interval for an Alluvial Sand WBZ well is not interpreted as resulting in the connection of two individual water bearing zones.

For the reasons described above, there was no need to include a large diameter surface casing in the design of well WS-8-59. With the availability of the attached boring logs / data tables, it is anticipated that Wacker will understand that the integrity of well WS-8-59 is not in question.

If you have any questions regarding the enclosed data, please do not hesitate to contact me at 503-796-0717.

Sincerely,



Robert Ede, R.G.
Associate

rede@hahnasoc.com

c: Mr. Bob Wyatt, NW Natural
Mr. Richard Bach, Stoel Rives LLP
Mr. Carl Stivers, Anchor Environmental, LLC
Ms. Cathryn Young, Wacker Siltronic Corporation
Mr. Rodney Struck, ODEQ Northwest Region

# DATA PACKAGE FOR
# BORING P-3 AND WS-8 SERIES WELLS

Focused Remedial Investigation
Wacker Siltronic Corporation Property
7200 NW Front Avenue
Portland, Oregon

October 5, 2001

Prepared for:

NW Natural
Portland, Oregon

Prepared by:

Hahn and Associates, Inc.
Portland, Oregon

HAI Project No. 5237

SCOEPA00010922

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1 Push Probe and Monitoring Well Location Map

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B Soil Boring Log P-3A

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D Monitoring Well Construction Log: WS-8-59




SCOEPA00010923

**TABLE 1**
**Summary of Analytical Results for Groundwater Samples: Temporary Well Point P-3**
**Detected Volatile Organic Compounds by EPA Method 8260**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Well Point Location | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Analytical Results – ug/l (ppb) VOCs by EPA Method 8260 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Aromatic VOCs (AVOCs) | | | | | | Halogenated VOCs (HVOCs) | | | | | |
| | | | | Benzene | Ethylbenzene | Toluene | Xylene | 1,2,4-TMB | Naphthalene | cis-1,2-DCE | TCE | Vinyl Chloride | Total AVOCs | Total HVOCs |
| P-3 | 5237-010821-321 | 21-Aug-01 | 28.5-32.5 | **104.** | 29.9 | ND> 10. | 22.3 | 23.6 | **933.** | ND> 10. | ND> 10. | ND> 12. | 1,089.2 | ND |
| | 5237-010821-323 | 21-Aug-01 | 55-59 | 23.6 | ND> 10. | ND> 10. | ND> 10. | ND> 1 | 53.7 | 312. | ND> 10. | 212. | 77.3 | 524. |
| | 5237-010821-325 | 21-Aug-01 | 96-100 | 21.5 | ND> 1. | ND> 1. | ND> 1. | ND> 1 | 5.82 | 5.99 | ND> 1. | 21.2 | 27.3 | 27.2 |
| Quality Control Samples | | | | | | | | | | | | | | |
| Trip Blank | 5237-010802-302 | 2-Aug-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 1 | ND> 2. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND |
| Trip Blank | 5237-010809-303 | 9-Aug-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 1 | ND> 2. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND |
| Trip Blank | 5237-010815-308 | 15-Aug-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 1 | ND> 2. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND |
| Trip Blank | 5237-010816-315 | 16-Aug-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 1 | ND> 2. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND |
| Trip Blank | 5237-010821-322 | 21-Aug-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 1 | ND> 2. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND |
| Trip Blank | 5237-010822-326 | 22-Aug-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 1 | ND> 2. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND |
| Water EB | 5237-010816-319 | 16-Aug-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 1 | ND> 2. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND |
| Soil EB | 5237-010821-324 | 21-Aug-01 | NA | ND> 1. | ND> 1. | ND> 1. | ND> 2. | ND> 1 | ND> 2. | ND> 1. | ND> 1. | ND> 1.2 | ND | ND |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | 71. [3] | 29,000. [3] | 200,000. [3] | # | # | 620. [4] | 11,600. [4] | 81. [3] | 525. [3] | # | # |

Note:
# = not established
AVOCs = aromatic volatile organic compounds
bgs = below ground surface
DCE = dichloroethene
EB = equipment blank
EPA = U.S. Environmental Protection Agency
HVOCs = halogenated volatile organic
ND = not detected above detection lim
ppb = parts per billion
ug/l = micrograms/liter
VOCs = volatile organic compounds
TCE = trichloroethene
TMB = trimethylbenzen

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC
4 = Reference Level based on Lowest Observable Health Effect Level for Freshwater, as provided within NOAA Screening Quick Reference Tables, updated September 1999
**Bold** = Detected above lowest identified AWQC



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**TABLE 2**
**Summary of Analytical Results for Groundwater Samples: Temporary Well Point P-3**
**Polynuclear Aromatic Hydrocarbons by EPA Method 8270 SIM or 8270C**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| PAHs by EPA Method 8270 (SIM) | | | | Analytical Results ug/l (ppb) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Carcinogenic PAHs | | | | | | | Non-carcinogenic PAHs | | | | | | | | | | |
| Well Point Location | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Benzo (a) anthracene | Benzo (b) fluoranthene | Benzo (k) fluoranthene | Benzo (a) pyrene | Chrysene | Dibenzo (ah) anthracene | Indeno (1,2,3-cd) pyrene | Acenaphthene | Acenaphthylene | Anthracene | Benzo (ghi) perylene | Fluoranthene | Fluorene | Naphthalene | Phenanthrene | Pyrene | Total PAHs |
| P-3 | 5237-010821-321 | 21-Aug-01 | 28.5-32.5 | **4.2** | **2.12** | ND> 2. | **4.23** | **5.34** | ND> 2. | ND> 2. | 62. | ND> 2. | 19.1 | 2.51 | 26.8 | 43. | 214. | 88.3 | 28. | 499.6 |
| | 5237-010821-323 | 21-Aug-01 | 55-59 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | 3.41 | ND> 2. | ND> 2. | ND> 2. | 2.48 | ND> 2. | 4.72 | 8.69 | 2.45 | 21.8 |
| | 5237-010821-325 | 21-Aug-01 | 96-100 | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | 7.56 | ND> 2. | 2.94 | ND> 2. | 5.55 | 3.95 | 12. | 22.8 | 5.41 | 60.2 |
| Quality Control Samples | | | | | | | | | | | | | | | | | | | | | |
| Trip Blank | 5237-010821-322 | 21-Aug-01 | NA | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND |
| Water EB | 5237-010816-319 | 16-Aug-01 | NA | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND |
| Soil EB | 5237-010821-324 | 21-Aug-01 | NA | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND> 2. | ND |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | 0.049 [3] | 0.049 [3] | 0.049 [3] | 0.049 [3] | 0.049 [3] | 0.049 [3] | 0.049 [3] | 2,700. [2] | # | 110,000. [3] | # | 370. [3] | 14,000. [3] | 620. [4] | # | 11,000. [3] | # |

Note:
# = not established
bgs = below ground surface
EB = equipment blank
EPA = U.S. Environmental Protection Agency
ND = not detected above detection limit indicated
PAHs = polynuclear aromatic hydrocarbons
ppb = parts per billion
ug/l = micrograms per liter

**1** = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
**2** = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
**3** = Reference Level based on Human Fish Consumption Criteria of AWQC
**4** = Reference Level based on Lowest Observable Health Effect Level for Freshwater, as provided within NOAA Screening Quick Reference Tables, updated September 1999
**Bold** = Detected above lowest identified AWQC


SCOEPA00010925

**TABLE 3**
**Summary of Analytical Results for Groundwater Samples: Temporary Well Point P-3**
**Detected Semi-Volatile Organic Compounds by EPA Method 8270C**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| SVOCs by EPA Method 8270 | | | | Analytical Results ug/l (ppb) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Point Location | HAI Sample Numbers | Sample Date | Screen Interval (feet bgs) | Bis 2-ethyl hexyl phthalate | | Butyl benzyl phthalate | | Carbazole | | Dibenzofuran | | Diethyl phthalate | | Bis (2-chloroisopropyl)ether | | 2-Methylnaphthalene | | PAHs |
| P-3 | 5237-010821-321 | 21-Aug-01 | 28.5-32.5 | ND> | 2. | ND> | 2. | 56.5 | | 6.29 | | ND> | 2. | ND> | 2. | 82.8 | | See Table 2 |
| | 5237-010821-323 | 21-Aug-01 | 55-59 | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | See Table 2 |
| | 5237-010821-325 | 21-Aug-01 | 96-100 | 5.57 | | 3.64 | | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | 3.21 | | See Table 2 |
| Quality Control Samples | | | | | | | | | | | | | | | | | | |
| Trip Blank | 5237-010821-322 | 21-Aug-01 | NA | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | See Table 2 |
| Water EB | 5237-010816-319 | 16-Aug-01 | NA | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | ND> | 2. | 8.1 | B | ND> | 2. | See Table 2 |
| Soil EB | 5237-010821-324 | 21-Aug-01 | NA | ND> | 2. | ND> | 2. | ND> | 4. | ND> | 2. | ND> | 2. | ND> | 2. | ND> | 2. | See Table 2 |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | 5.9 | [3] | 5,200. | [3] | # | | # | | 120,000. | [3] | 170,000. | [3] | # | | # |

Note:
bgs = below ground surface
EB = equipment blank
EPA = U.S. Environmental Protection Agency
ND = Not detected above detection limit indicated
PAHs = polynuclear aromatic hydrocarbons
ppb = parts per billion
ug/l = micrograms/liter
# = not established

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consu
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC
B = Analyte detected in the associated Method Blank

**TABLE 4**
**Summary of Analytical Results for Groundwater Samples: Temporary Well Point P-3**
**Metals, Cyanide, and Chloride**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

| Well Point Location | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Analytical Results – mg/l (ppm) Dissolved Metals by EPA Methods 6010, 200.7 and/or 7000 Series | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Antimony | Arsenic | Barium | Cadmium | Chromium | Cobalt | Copper | Iron | Lead | |
| P-3 | 5237-010821-321 | 21-Aug-01 | 28.5-32.5 | ND> 0.003 | **0.016** | 0.172 | ND> 0.001 | ND> 0.001 | ND> 0.001 | 0.001 | 100. | ND> 0.005 | |
| | 5237-010821-323 | 21-Aug-01 | 55-59 | ND> 0.003 | ND> 0.005 | 0.126 | ND> 0.001 | 0.003 | 0.007 | 0.002 | 40.4 | ND> 0.005 | |
| | 5237-010821-325 | 21-Aug-01 | 96-100 | ND> 0.003 | ND> 0.005 | 0.101 | ND> 0.001 | 0.002 | 0.005 | 0.002 | 46.5 | ND> 0.005 | |
| Quality Control Samples | | | | | | | | | | | | | |
| Trip Blank | 5237-010821-322 | 21-Aug-01 | NA | ND> 0.003 | ND> 0.005 | ND> 0.002 | ND> 0.001 | ND> 0.002 | ND> 0.001 | 0.001 | 0.033 | ND> 0.005 | |
| Water EB | 5237-010816-319 | 16-Aug-01 | NA | ND> 0.005 | ND> 0.005 | ND> 0.002 | ND> 0.002 | ND> 0.005 | ND> 0.005 | ND> 0.005 | 0.086 | ND> 0.005 | |
| Soil EB | 5237-010821-324 | 21-Aug-01 | NA | ND> 0.003 | ND> 0.005 | ND> 0.002 | ND> 0.002 | ND> 0.002 | ND> 0.001 | ND> 0.001 | 0.02 | ND> 0.005 | |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | 4.3 [3] | 0.00014 [3] | # | 0.002 [2] | 0.011 [2] | # | 0.009 [2] | # | 0.003 [2] | |

Note: # = not established
bgs = below ground surface
EB = equipment blank
EPA = U.S. Environmental Protection Agency
mg/l = milligrams/liter
ND = not detected above detection limit indicated
ppm = parts per million

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC
**Bold** = Detected above lowest identified AWQC

Updated: 10/5/01 RBE


SCOEPA00010927

**TABLE 4**
**Summary of Preliminary Analytical Results for Groundwater Samples: Temporary Well Points**
**Metals, Cyanide, and Chloride**

Source Control Evaluation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Well Point Location | HAI Sample Number | Sample Date | Screen Interval (feet bgs) | Analytical Results – mg/l (ppm) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Dissolved Metals by EPA Methods 6010, 200.7 and/or 7000 Series | | | | | | | | EPA Method 9010 | EPA Method 300 |
| | | | | Magnesium | Manganese | Nickel | Selenium | Silver | Titanium | Vanadium | Zinc | Cyanide | Chloride |
| P-3 | 5237-010821-321 | 21-Aug-01 | 28.5-32.5 | 24.6 | 5.06 | 0.007 | ND> 0.005 | ND> 0.002 | 0.046 | 0.005 | 0.005 0.017 | **0.65** | 7. |
| | 5237-010821-323 | 21-Aug-01 | 55-59 | 59.6 | 0.771 | 0.03 | ND> 0.005 | ND> 0.002 | 0.107 | 0.005 | 0.078 | **0.45** | 2. |
| | 5237-010821-325 | 21-Aug-01 | 96-100 | 41.7 | 2.06 | 0.039 | ND> 0.005 | ND> 0.002 | 0.059 | 0.003 | 0.173 | **0.498** | 9.5 |
| Quality Control Samples | | | | | | | | | | | | | |
| Trip Blank | 5237-010821-322 | 21-Aug-01 | NA | ND> 0.025 | ND> 0.025 | ND> 0.003 | ND> 0.005 | ND> 0.002 | ND> 0.001 | ND> 0.001 | 0.009 | **0.022** | |
| Water EB | 5237-010816-319 | 16-Aug-01 | NA | ND> 0.05 | ND> 0.005 | ND> 0.003 | ND> 0.005 | ND> 0.005 | 0.002 | ND> 0.001 | 0.003 | ND> 0.02 | 23.8 |
| Soil EB | 5237-010821-324 | 21-Aug-01 | NA | ND> 0.025 | ND> 0.005 | ND> 0.003 | ND> 0.005 | ND> 0.002 | ND> 0.001 | ND> 0.001 | ND> 0.006 | ND> 0.02 | ND> 0.5 |
| Ambient Water Quality Criteria (AWQC) for Surface Water [1] | | | | # | # | 0.052 [2] | 0.005 [2] | 0.003 [2] | # | # | 0.12 [2] | 0.005 [2] | # |

Note: # = not established
bgs = below ground surface
EB = equipment blank
EPA = U.S. Environmental Protection Agency
mg/l = milligrams/liter
ND = not detected above detection limit indicated
ppm = parts per million

1 = Reference Level indicated is the lowest guidance value provided in the Ambient Water Quality Criteria (EPA 822-Z-99-001) based on Fresh Acute, Fresh Chronic (Aquatic Life Protection) and Fish Consumption Only (Human Health Protection)
2 = Reference Level based on Aquatic Fresh Chronic Criteria of AWQC
3 = Reference Level based on Human Fish Consumption Criteria of AWQC
**Bold** = Detected above lowest identified AWQC

Updated: 10/5/01 RBE


SCOEPA00010928

**TABLE 5**
**Summary Of Analytical Results for Soil Samples: Boring P-3**
**TPH, BTEX, Total PAHs, and Cyanide**

Source Control Evaluation
Focused Remedial Investigation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Soil Sample Number | Sample Number | Sample Date | Depth (feet bgs) | Field Observation | | | | | | Analytical Results mg/kg (ppm) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Northwest Method | | | | | EPA Method 8270 PAHs | | EPA Method 8260 Volatile Aromatics | | | | | | EPA Method 336 |
| | | | | | | | | | | TPH-HCID | | | TPH-Dx | | | | | | | | | | |
| | | | | Dis-coloration | Odor | Sheen by Sheen Test | Lamp Black | Oil | Tar | Gasoline | Diesel | Oil | Diesel | Oil | Carcinogenic PAHs | Total PAHs | Benzene | Toluene | Ethylbenzene | Xylenes | Total BTEX | Total Cyanide |
| P-3 | 5237-010820-152 | 20-Aug-01 | 6.5 | | | | | | | | | | ND> 22 | 100. | - | - | - | - | - | - | - | ND> 0.02 |
| | 5237-010820-155 | 20-Aug-01 | 17.0 | X | X | X | | | | ND>2,150 | Detect | ND>10,800 | **1,120.** | **613.** | 1,115. | 7,308. | ND> 0.5 | ND> 0.5 | 3.36 | 6.68 | 10.04 | 13,900. |
| | 5237-010820-159 | 20-Aug-01 | 35.5 | | | | | | | | | | ND> 29 | 106. | - | - | - | - | - | - | - | - |
| Reference Levels[1] | | | | | | | | | | # | # | # | 500. | 500. | # | # | 2. | 80. | 100. | # | # | # |

Note: BTEX = benzene, toluene, ethylbenzene, and xylenes
EPA = U.S. Environmental Protection Agency
mg/kg = milligrams/kilogram
ND = not detected above detection limit indicated
PAHs = polynuclear aromatic hydrocarbons
ppm = parts per million
TPH = total petroleum hydrocarbons
**Bold** = Detected above Reference Standard

[1] = TPH standards based on the ODEQ UST Level 2 Soil Cleanup Standards (OAR 340-122-335); Other standards based on lowest guidance value provided in the NOAA Screening Quick Reference Tables for Freshwater Sediments (Rev. September 1999) based on Threshold Effects Level, Probable Effects Level, and Upper Effects Threshold

**TABLE 6**
**Summary of Analytical Results for Soil Samples: Boring P-3**
**Detected Volatile Organic Compounds by EPA Method 8260**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Soil Sample Location | HAI Sample Number | Sample Date | Sample Depth | Analytical Results - mg / kg (ppm) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | VOCs by EPA Method 8260 mg/kg (ppm) | | | | | | | | | | | | | |
| | | | | Aromatic VOCs (AVOCs) | | | | | | | | Halogenated VOCs (HVOCs) | | | | | |
| | | | (feet bgs) | Benzene | n-Butylbenzene | Ethyl-benzene | Toluene | 1,2,4-TMB | 1,3,5-TMB | Naphthalene | Xylene | cis-1,2-DCE | trans-1,2-DCE | TCE | Vinyl Chloride | Other VOCs |
| P-3 | 5237-010820-155 | 20-Aug-01 | 17.0 | ND> 0.5 | 0.57 | 3.36 | ND> 0.5 | 15.6 | 4.59 | **1,100.** | 6.68 | ND>0.5 | ND> 0.5 | ND> 0.5 | ND> 0.6 | 4-Isopropyltoluene=1.69<br>Isopropylbenzene=1.18 |
| Reference Levels [1] | | | | # | # | # | # | # | # | 0.6[3] | # | # | # | # | # | # |

Note:
# = not established
bgs = below ground surface
DCE = dichloroethene
EPA = U.S. Environmental Protection Agency
HVOCs = halogenated volatile organic compounds
MCL = Maximum Contaminant Level
ND = not detected above detection limit indicated
ppb = parts per billion
TCE = trichloroethene
VOCs = volatile organic compounds

1 = Reference Level indicated is the lowest guidance value provided in the NOAA Screening Quick Reference Tables for Freshwater Sediments (Rev. September 1999) based on Threshold Effects Level, Probable Effects Level, and Upper Effects Threshold
2 = Reference Level based on Threshold Effects Level
3 = Reference Level based on Upper Effects Threshold

**Bold** = Detected above lowest identified Reference Level

**TABLE 7**
**Summary of Analytical Results for Soil Samples: Boring P-3**
**Polynuclear Aromatic Hydrocarbons**
Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| PAHs by EPA Method 8270C | | | | Analytical Results mg/kg (ppm) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Carcinogenic PAHs | | | | | | | Non-carcinogenic PAHs | | | | | | | | | | |
| Soil Sample Location | HAI Sample Number | Sample Date | Sample Depth (feet bgs) | Benzo (a) anthracene | Benzo (b) fluoranthene | Benzo (k) fluoranthene | Benzo (a) pyrene | Chrysene | Dibenzo (ah) anthracene | Indeno (1,2,3-cd) pyrene | Acenaphthene | Acenaphthylene | Anthracene | Benzo (ghi) perylene | Fluoranthene | Fluorene | Naphthalene | Phenanthrene | Pyrene | Total Carcinogenic PAHs | Total PAHs |
| P-3 | 5237-010820-155 | 20-Aug-01 | 17.0 | **220.** | 163. | **141.** | **204.** | **247.** | **25.4** | **115.** | **523.** | **48.7** | **208.** | **201.** | **713.** | **282.** | **1,790.** | **1,600.** | **827.** | 1,115.4 | 7,308.1 |
| Reference Levels [1] | | | | 0.108[4] | # | 13.4[3] | 0.150[4] | 0.166[4] | 0.033[4] | 0.330[3] | 0.290[3] | 0.160[3] | 0.0572[4] | 0.300[3] | 0.423[4] | 0.0774[4] | 0.176[4] | 0.204[4] | 0.195[4] | # | 1.61[4] |

Note: # = Reference Level not established
EPA = U.S. Environmental Protection Agency
ND = not detected above detection limit indicated

PAHs = polynuclear aromatic hydrocarbons
ppm = parts per million
mg/kg = milligrams per kilogram

1 = Reference Level indicated is the lowest guidance value provided in the NOAA Screening Quick Reference Tables for Freshwater Sediments (Rev. September 1999) based on Threshold Effects Level, Probable Effects Level, and Upper Effects Threshold
2 = Reference Level based on Threshold Effects Level
3 = Reference Level based on Upper Effects Threshold
4 = Reference Level based on Concensus-Based Threshold Effects Level, MacDonald, Ingersoll, and Berger, *Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems* , January 13, 2000
**Bold** = Detected above lowest identified Reference Level


SCOEPA00010931

# TABLE 8

**Summary of Analytical Results for Soil Samples: Boring P-3**
**Detected Semi-Volatile Organic Compounds by EPA Method 8270C**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Phenols by EPA Method 8270 | | | | Analytical Results mg/kg (ppm) | | | |
|---|---|---|---|---|---|---|---|
| Soil Sample Location | HAI Sample Number | Sample Date | Sample Depth1 (feet bgs) | 2-Methylnaphthalene | Carbozole | Dibenzofuran | PAHs |
| P-3 | 5237-010820-155 | 20-Aug-01 | 17.0 | 683. | 44. | 49.3 | See Table 7 |
| Reference Levels [1] | | | | # | # | # | |

Note: EPA = U.S. Environmental Protection Agency
mg/kg = milligrams/kilogram
ND = not detected above detection limit indicated
ppm = parts per million
# = not established

1 = Reference Level indicated is the lowest guidance value provided in the NOAA Screening Quick Reference Tables for Freshwater Sediments (Rev. : Threshold Effects Level, Probable Effects Level, and Upper Effects Threshold

SCOEPA00010932

**TABLE 9**
**Summary of Analytical Results for Soil Samples: Boring P-3**
**Metals**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Soil Sample Location | HAI Sample Number | Sample Date | Sample Depth | Analytical Results – mg/kg (ppm) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Total Metals by EPA Methods 6010, 200.7 and/or 7000 Series | | | | | | | | | | | | | | |
| | | | (feet bgs) | Antimony | Arsenic | Cadmium | Chromium | Cobolt | Copper | Iron | Lead | Manganese | Nickel | Selenium | Silver | Titanium | Vanadium | Zinc |
| P-3 | 5237-010820-152 | 20-Aug-01 | 6.5 | 0.96 | 3.12 | ND> 1. | 12.3 | 13.2 | 12.6 | **23,400.** | 1.04 | 269. | 14.8 | ND> 0.5 | ND> 0.5 | 1,520. | 65.4 | 42.6 |
| | 5237-010820-155 | 20-Aug-01 | 17.0 | 0.79 | 3.28 | ND> 1. | 10.9 | 11.8 | 15.5 | **21,700.** | 9.21 | 190. | 14.7 | ND> 0.5 | ND> 0.5 | 1,270. | 57.7 | 44.4 |
| Reference Levels [1] | | | | 3.[3] | # | 9.79[4] | 0.99[4] | 43.4[4] | # | 31.6[4] | 4,000[3] | 35.8[4] | 1,100[3] | 22.7[4] | # | 4.5[3] | # | # | 121[4] |

Note: bgs = below ground surface
EPA = U.S. Environmental Protection Agency
mg/kg = milligrams/kilogram
ND = not detected above detection limit indicated
ppm = parts per million
# = Reference Levels not established

1 = Reference Level indicated is the lowest guidance value provided in the NOAA Screening Quick Reference Tables for Freshwater Sediments (Rev. September 1999) based on Threshold Effects Level, Probable Effects Level, and Upper Effects Threshold
2 = Reference Level based on Threshold Effects Level
3 = Reference Level based on Upper Effects Threshold
4 = Reference Level based on Concensus-Based Threshold Effects Level, MacDonald, Ingersoll, and Berger, *Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems* , January 13, 2000



SCOEPA00010933

Willamette River

Former Channelized Creek Discharge (1913 - 1941)

Former Channelized Creek Discharge (1941 - 1967)

Area of Dredging-Induced Sheen (1998)

Former Western Transportation Docks and Structures (1930-1950)

Former Shell Transfer Facilities (1913-1940)

SD-062 SD-063 SD-064 SD-065 SD-067 SD-068 SD-069 SD-070 SD-072 SD-075 SD-077

P-1 P-2 P-3 P-4 P-5 P-6 P-7 P-8 P-9 P-10 P-11

WS8-59 WS8-33 WS9-34

MW-2 MW-3 MW-4 MW-5 MW-6 MW-8 MW-9 MW-10 MW-11 MW-12 MW-13 MW-14 MW-15

NW Natural

B-1-8 B-2-8 B-3-8 B-4-8 B-5-8 B-HQ-8 B-1 B-3 B-32 B-33 B-34 B-35 B-101-8 B-102-8 B-SU-8

Former Lowland Ponded Area

Former Gasco Effluent Ponds (1941-1955) Filled by 1971

Former Lowland (1913 - 1971)

1981 Chromic / Nitric Acid Spill Location

1984 TCE Spill Location

1997 Caustic Solution Spill Location

GP-25 GP-26 RP-01 GP-27 RP-06

Wacker Siltronic

Approximate Area of 1979 Olympic Pipeline Leak /Investigation

Utility Easement

Limit of Spent Oxide / Lampblack Fill (1955-1970)

Wastewater Treatment Plant Spill Locations

Approximate Limit of Waste Product Fill (1970)

WS-1 WS-2 WS-3 WS-4 WS-5 WS-6 WS-7 W-3-81 GP-11

Former Creek

Former N. Doane Lake Remnant

RP-03 (abandoned) RP-03R

NW St. Helens Road

PZ-02

N

**LEGEND**

- Site Boundary
- Existing Structure or Feature
- Railroad Tracks
- Existing Monitoring Well Location
- EPA Sediment Sampe Location
- Select Boring Location
- Push Probe Location

Note: Wells and Push Probes installed along Wacker Siltronic Riverfront have not been surveyed: locations are approximate.

0 250 500

Approximate Scale in Feet

**Figure 1**

**Monitoring Well and Push Probe Location Map**

Focused Remedial Investigation
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

**HAHN & ASSOCIATES, INC.**
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717

**August 2001**

**Project No. 5237**

SCOEPA00010934

**APPENDIX A**

**Soil Boring Log:**

**P-3**



SCOEPA00010935

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-3** | | | |
|---|---|---|---|---|
| | HAI LOGGER: | Rob Ede | DRILL START | DRILL FINISH |
| PROJECT: | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | Time: | Time: |
| RI / Source Control Evaluation | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| Wacker Siltronic Corporation Property | EQUIPMENT TYPE | Geo-Probe | 9:12 | 16:20 |
| Portland, Oregon | DRILLER: | Heriberto Ramirez | Date: | Date: |
| PROJECT #: 5237 | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | 08/20/01 | 08/20/01 |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | DEPTH (feet) | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | 1 | SP | Surface: grass covered silty, SAND with Gravel, light brown, dry, no hydrocarbon odor, no sheen (0 to 1 foot below ground surface (bgs)). |
| | | | | | 2 | | SAND with Gravel - light brown, dry, becoming slightly moist at 4 feet bgs, fine-grained with minor Gravel (<1%), gravels are up to 1/2-inch diameter and are both rounded and angular, well graded, thin (1/4-inch) silt layer at 5.5 feet bgs, no hydrocarbon odor, no sheen (1 to 13 feet bgs). |
| | | | | | 3 | | |
| | 151 | 9:16 | 2.5 | - | 4 | | |
| | | | | | 5 | | |
| | | | | | 6 | | |
| | 152 | 9:24 | 4.0 | 100 | 7 | | |
| | | | | | 8 | | |
| | | | | | 9 | | |
| | | | | | 10 | SP | |
| | | | | | 11 | | |
| | 153 | 9:29 | 3.6 | - | 12 | | |
| | | | | | 13 | | SAND with Gravel - 5-inch thick zone of grey discoloration with petroleum odor and slight to moderate sheen when wetted at 13 feet bgs, no oil or tar observed, a steel bolt is present within zone of impact (13 to 13.5 feet bgs). |
| | 154 | 9:45 | 8.8 | - | 14 | | |
| | | | | | 15 | | SAND with Gravel - light brown, dry, no sheen, no petroleum odor, no oil or tar observed (13.5 to 16.5 feet bgs). |
| | | | | | 16 | | |
| | | | | | 17 | | SAND with Gravel - grey discoloration with petroleum (creosote) odor and sheen when wetted, a 1/2-inch diameter rubber hose fragment is present at 16.5 feet bgs, no oil product or tar observed (16.5 to 18 feet bgs). |
| | 155 | 9:55 | 102 | 1,733 | 18 | | SAND with Gravel - light brown with patchy zones of grey discoloration extending to 23.5 feet bgs, petroleum odor, no sheen, no oil or tar observed (18 to 23.5 feet bgs). |
| | | | | | 19 | | |
| | | | | | 20 | | |



SCOEPA00010936

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-3** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START<br>Time:<br>9:12<br>Date:<br>08/20/01 | DRILL FINISH<br>Time:<br>16:20<br>Date:<br>08/20/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| BORING DIAMETER: | 1.5-inch |
|---|---|
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | DEPTH (feet) | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|
| Bentonite Grout | 156 | 10:02 | 53.1 | - | 21–25 | SP | SAND with Gravel - grey (natural?), dry, petroleum odor, no sheen, no oil or tar observed (23.5 to 30.5 feet bgs). |
| | 157 | 10:15 | 22.7 | - | 26–30 | SP | SAND with Gravel - grey, petroleum odor, slightly wet, sheen, no oil or tar observed (30.5 to 32.5 feet bgs). |
| | 158 | 10:30 | 15 | - | 31–35 | ML | SILT - grey with tan mottling, moist to very moist, slightly plastic, rootlets, several sandy silt layers (3 to 4-inches thick) in 33 to 35 foot depth interval, no petroleum odor, no sheen (32.5 to 36 feet bgs). |
| | 159 | 10:45 | 12.5 | 106 | 36–39 | SM | Silty SAND - grey and light brown, wet, very fine grained, no petroleum odor, no sheen (36-40.5 feet bgs). |
| | 160 | 10:55 | 7.0 | - | 40 | SM | |



SCOEPA00010937

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-3** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 9:12 Date: 08/20/01 | DRILL FINISH Time: 16:20 Date: 08/20/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 41 | | SM | SAND - grey, wet, very fine grained, muscovite present, no petroleum odor, no sheen (40.5-42 feet bgs). |
| | | | | | | | 42 | | SP | |
| | | | | | | | 43 | | SM | Silty SAND - grey, moist, no sheen, no petroleum odor (42-43.5 feet bgs). |
| | 161 | 11:10 | - | - | | | 44 | | ML | SILT - grey, slightly moist, stiff, non-plastic, rootlets, shell fragments, no petroleum odor, no sheen (43.5 - 44 feet bgs). |
| | | | | | | | 45 | | SP | SAND - grey, wet, fine grained, poorly graded, woody material in upper sand zone, no petroleum odor, no sheen (44-48 feet bgs). |
| | | | | | | | 46 | | | |
| | | | | | | | 47 | | | |
| | 162 | 11:40 | 10.1 | - | | | 48 | | | |
| | | | | | | | 49 | | ML | Sandy SILT - grey, moist, stiff, non-plastic, no petroleum odor, no sheen (48 - 51 feet bgs). |
| | | | | | | | 50 | | | |
| | | | | | | | 51 | | | |
| | 163 | 11:45 | 9.3 | - | | | 52 | | SP | SAND - grey, wet, fine grained, poorly graded, no petroleum odor, possible solvent odor (faint) from 59 feet to 64 feet bgs, no sheen (51-76 feet bgs). |
| | | | | | | | 53 | | | |
| | | | | | | | 54 | | | |
| | 164 | 12:02 | 10.7 | - | | | 55 | | | |
| | | | | | | | 56 | | | |
| | | | | | | | 57 | | | |
| | | | | | | | 58 | | | |
| | | | | | | | 59 | | | |
| | - | 12:20 | 9.5 | - | | | 60 | | | |



SCOEPA00010938

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-3** | | | |
|---|---|---|---|---|
| PROJECT: | HAI LOGGER: | Rob Ede | DRILL START | DRILL FINISH |
| RI / Source Control Evaluation | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | Time: | Time: |
| Wacker Siltronic Corporation Property | DRILLING METHOD: | Hydraulic Push Soil Probe | 9:12 | 16:20 |
| Portland, Oregon | EQUIPMENT TYPE | Geo-Probe | Date: | Date: |
| PROJECT #: 5237 | DRILLER: | Heriberto Ramirez | 08/20/01 | 08/20/01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 61 | | | |
| | | | | | | | 62 | | | |
| | | | | | | | 63 | | | |
| | 165 | 12:45 | 9.2 | - | | | 64 | | | |
| | | | | | | | 65 | | | |
| | | | | | | | 66 | | SP | |
| | | | | | | | 67 | | | |
| | | | | | | | 68 | | | |
| | | | | | | | 69 | | | |
| | | | | | | | 70 | | | |
| | | | | | | | 71 | | | |
| | | | | | | | 72 | | | |
| | | | | | | | 73 | | | |
| | | | | | | | 74 | | | |
| | | | | | | | 75 | | | |
| | | | | | | | 76 | | | |
| | | | | | | | 77 | | SP | SAND - as above, no petroleum or solvent odor, no sheen (76-80 feet bgs). |
| | | | | | | | 78 | | | |
| | 166 | 13:30 | 9.0 | - | | | 79 | | | |
| | | | | | | | 80 | | | |



SCOEPA00010939

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-3** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Rob Ede | DRILL START Time: 9:12<br>Date: 08/20/01 | DRILL FINISH Time: 16:20<br>Date: 08/20/01 |
| | SAMPLING METHOD: | Stainless Steel Soil Sampler with PVC Sleeve | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| BORING DIAMETER: | 1.5-inch |
|---|---|
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 81 | | | |
| | | | | | | | 82 | | | |
| | | | | | | | 83 | | | |
| | | | | | | | 84 | | | |
| | | | | | | | 85 | | SP | |
| | | | | | | | 86 | | | |
| Soil Sampler | | | | | | | 87 | | | |
| | | | | | | | 88 | | | |
| | | | | | | | 89 | | | |
| | | | | | | | 90 | | | |
| | | | | | | | 91 | | | |
| | | | | | | | 92 | | | |
| | | | | | | | 93 | | | |
| | | | | | | | 94 | | | |
| | | | | | | | 95 | | | |
| | | | | | | | 96 | | | |
| | | | | | | | 97 | | | |
| | | | | | | | 98 | | | |
| | | | | | | | 99 | | | |
| | | | | | | | 100 | | | |

NOTE: Soil Sampler (4-foot length) became stuck in hole (apparent sand heave / lock) during attempted push at 90 feet bgs. Sampler, with two feet of rod stem remain in hole. Pressure grouted hole with tremie tube from top of sampler (86 feet bgs) to ground surface.

Boring terminated at 90.0 feet bgs.

*Sample prefix is 5237-010820-



SCOEPA00010940

**APPENDIX B**

**Soil Boring Log:**

**P-3A**

(Installed for Groundwater Sample Collection Only)



SCOEPA00010941

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-3A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: Jay Greifer<br>SAMPLING METHOD: N/A<br>DRILLING METHOD: Hydraulic Push Soil Probe<br>EQUIPMENT TYPE Geo-Probe<br>DRILLER: Heriberto Ramirez<br>DRILLING CONTRACTOR: Geo-Tech Explorations, Inc. | DRILL START Time: 8:38<br>Date: 08/21/01 | DRILL FINISH Time: 13:36<br>Date: 08/21/01 |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 1 | | SP | Note: No soil samples collected. Pushed with well point directly to groundwater sample depths. See boring log for probe P-3 for soil description |
| | | | | | | | 2 | | | |
| | | | | | | | 3 | | | |
| | | | | | | | 4 | | | |
| | | | | | | | 5 | | | |
| | | | | | | | 6 | | | |
| | | | | | | | 7 | | | |
| | | | | | | | 8 | | | |
| | | | | | | | 9 | | | |
| | | | | | | | 10 | | SP | |
| | | | | | | | 11 | | | |
| | | | | | | | 12 | | | |
| | | | | | | | 13 | | | |
| | | | | | | | 14 | | | |
| | | | | | | | 15 | | | |
| | | | | | | | 16 | | | |
| | | | | | | | 17 | | | |
| | | | | | | | 18 | | | |
| | | | | | | | 19 | | | |
| | | | | | | | 20 | | | |

| BORING DIAMETER: | 1.5-inch |
|---|---|
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |



SCOEPA00010942

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-3A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon | HAI LOGGER: | Jay Greifer | DRILL START Time: 8:38 | DRILL FINISH Time: 13:36 |
| | SAMPLING METHOD: | N/A | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | Date: 08/21/01 | Date: 08/21/01 |
| PROJECT #: 5237 | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 21 | | SP | |
| | | | | | | | 22 | ▽ | | Water Level measured for 55' - 59' bgs screen interval |
| | | | | | | | 23 | | | |
| | | | | | | | 24 | | | |
| | | | | | | | 25 | | | |
| | | | | | | | 26 | | | |
| | | | | | | | 27 | | | |
| | | | | | | | 28 | | | |
| | | | | | | | 29 | ▽ | | Water Level measured for 28.5' - 32.5' bgs screen interval |
| | | | | | | | 30 | | | **GROUNDWATER SAMPLE**<br>Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 28.5 to 32.5 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010821-321) was collected with disposable tubing/check valve at 9:41 hours, 8/21/01. Water level was measured at 28.5 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced. |
| | | | | | | | 31 | | | |
| | | | | | | | 32 | | | |
| | | | | | | | 33 | | | |
| | | | | | | | 34 | ▽ | ML | Water Level measured for 96' - 100' bgs screen interval |
| | | | | | | | 35 | | | |
| | | | | | | | 36 | | | |
| | | | | | | | 37 | | | |
| | | | | | | | 38 | | SM | |
| | | | | | | | 39 | | | |
| | | | | | | | 40 | | | |



SCOEPA00010943

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-3A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Jay Greifer | DRILL START Time: 8:38 Date: 08/21/01 | DRILL FINISH Time: 13:36 Date: 08/21/01 |
| | SAMPLING METHOD: | N/A | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 41 | | SM | |
| | | | | | | | 42 | | SP | |
| | | | | | | | 43 | | SM | |
| | | | | | | | 44 | | ML | |
| | | | | | | | 45 | | SP | |
| | | | | | | | 46 | | | |
| | | | | | | | 47 | | | |
| | | | | | | | 48 | | | |
| | | | | | | | 49 | | ML | |
| | | | | | | | 50 | | | |
| | | | | | | | 51 | | SP | |
| | | | | | | | 52 | | | |
| | | | | | | | 53 | | | |
| | | | | | | | 54 | | | |
| | | | | | | | 55 | | | |
| | | | | | | | 56 | | | |
| | | | | | | | 57 | | | |
| | | | | | | | 58 | | | |
| | | | | | | | 59 | | | |
| | | | | | | | 60 | | | |

**GROUNDWATER SAMPLE**
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 55 to 59 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010821-323) was collected with disposable tubing/check valve at 10:57 hours, 8/21/01. Water Level was measured at 22 feet bgs immediately prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.



SCOEPA00010944

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | SOIL BORING NUMBER P-3A | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: Jay Greifer<br>SAMPLING METHOD: N/A<br>DRILLING METHOD: Hydraulic Push Soil Probe<br>EQUIPMENT TYPE Geo-Probe<br>DRILLER: Heriberto Ramirez<br>DRILLING CONTRACTOR: Geo-Tech Explorations, Inc. | DRILL START Time: 8:38<br>Date: 08/21/01 | DRILL FINISH Time: 13:36<br>Date: 08/21/01 |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) |
|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 61 | | SP |
| | | | | | | | 62 | | |
| | | | | | | | 63 | | |
| | | | | | | | 64 | | |
| | | | | | | | 65 | | |
| | | | | | | | 66 | | |
| | | | | | | | 67 | | |
| | | | | | | | 68 | | |
| | | | | | | | 69 | | |
| | | | | | | | 70 | | |
| | | | | | | | 71 | | |
| | | | | | | | 72 | | |
| | | | | | | | 73 | | |
| | | | | | | | 74 | | |
| | | | | | | | 75 | | |
| | | | | | | | 76 | | |
| | | | | | | | 77 | | SP |
| | | | | | | | 78 | | |
| | | | | | | | 79 | | |
| | | | | | | | 80 | | |

| BORING DIAMETER: | 1.5-inch |
|---|---|
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

SOIL DESCRIPTION



SCOEPA00010945

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **SOIL BORING NUMBER P-3A** | | | |
|---|---|---|---|---|
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT #: 5237 | HAI LOGGER: | Jay Greifer | DRILL START Time: 8:38<br>Date: 08/21/01 | DRILL FINISH Time: 13:36<br>Date: 08/21/01 |
| | SAMPLING METHOD: | N/A | | |
| | DRILLING METHOD: | Hydraulic Push Soil Probe | | |
| | EQUIPMENT TYPE | Geo-Probe | | |
| | DRILLER: | Heriberto Ramirez | | |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations, Inc. | | |

| | |
|---|---|
| BORING DIAMETER: | 1.5-inch |
| CASING DIAMETER: | Not Applicable |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Applicable |

| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | 81 | | SP | |
| | | | | | | | 82 | | | |
| | | | | | | | 83 | | | |
| | | | | | | | 84 | | | |
| | | | | | | | 85 | | | |
| | | | | | | | 86 | | | |
| | | | | | | | 87 | | | |
| | | | | | | | 88 | | | |
| | | | | | | | 89 | | | |
| | | | | | | | 90 | | | |
| | | | | | | | 91 | | | |
| | | | | | | | 92 | | | |
| | | | | | | | 93 | | | |
| | | | | | | | 94 | | | |
| | | | | | | | 95 | | | |
| | | | | | | | 96 | | | |
| | | | | | | | 97 | | | |
| | | | | | | | 98 | | | |
| | | | | | | | 99 | | | |
| | | | | | | | 100 | | | |

**GROUNDWATER SAMPLE**
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 96 to 100 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010821-325) was collected with disposable tubing/check valve at 12:10 hours, 8/21/01. Water level was measured at 34 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was abandoned.

Boring terminated at 100.0 feet bgs and sealed from base to top with bentonite grout.



SCOEPA00010946

**APPENDIX C**

**Monitoring Well Construction Log:**

**WS-8-33**



SCOEPA00010947

**HAHN & ASSOCIATES, INC.**
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

PROJECT:
RI / Source Control Evaluation
Wacker Siltronic Corporation Property
Portland, Oregon
PROJECT: 5237

# MONITORING WELL NUMBER WS-8-33

OWRD #

| | | DRILL START | DRILL FINISH |
|---|---|---|---|
| HAI LOGGER: | Jill Bets | | |
| SAMPLING METHOD: | 1.5-inch OD Split Spoon | | |
| DRILLING METHOD: | 6 1/4-inch ID Hollow Stem Auger | Time: 15:30 | Time: 16:15 |
| EQUIPMENT TYPE | B-59 Mobil Drill | | |
| DRILLER: | Armando Paco | Date: 12-Sep-01 | Date: 12-Sep-01 |
| DRILLING CONTRACTOR: | Geo-Tech Explorations | | |

| | |
|---|---|
| BORING DIAMETER: | 10-inch |
| CASING DIAMETER: | 2-inch ID |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Measured |

| WELL CONSTRUCTION DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS TOTAL PAHs (ppm) | SPLIT SPOON BLOW COUNT | RECOVERY (%) | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Flush Monument | | | | | | | | | | Ground surface |
| Concrete | | | | | | | 1 | | | NOTE: No Soil Samples Collected. For full Soil Description, see log for boring P-3, installed approximately 5 feet to the northwest of WS-8-33. |
| | | | | | | | 2 | | | |
| | | | | | | | 3 | | | |
| | | | | | | | 4 | | | |
| | | | | | | | 5 | | SP | |
| | | | | | | | 6 | | | |
| | | | | | | | 7 | | | |
| Bentonite Chips | | | | | | | 8 | | | |
| | | | | | | | 9 | | | |
| | | | | | | | 10 | | | |
| | | | | | | | 11 | | | |
| | | | | | | | 12 | | | |
| | | | | | | | 13 | | | |
| | | | | | | | 14 | | | |
| | | | | | | | 15 | | | |
| | | | | | | | 16 | | | |
| | | | | | | | 17 | | | |
| | | | | | | | 18 | | SP | |
| | | | | | | | 19 | | | |
| 2-inch ID Blank Schedule 40 PVC | | | | | | | 20 | | | |



SCOEPA00010948

| HAHN & ASSOCIATES, INC. | MONITORING WELL NUMBER | WS-8-33 | | |
|---|---|---|---|---|
| 434 NW Sixth Avenue | OWRD # | | | |
| Portland, Oregon | HAI LOGGER: | Jill Bets | DRILL START | DRILL FINISH |
| (503) 796-0717 | SAMPLING METHOD: | 1.5-inch OD Split Spoon | | |
| PROJECT: | DRILLING METHOD: | 6 1/4-inch ID Hollow Stem Auger | Time: | Time: |
| RI / Source Control Evaluation | EQUIPMENT TYPE | B-59 Mobil Drill | 15:30 | 16:15 |
| Wacker Siltronic Corporation Property | DRILLER: | Armando Paco | Date: | Date: |
| Portland, Oregon | DRILLING CONTRACTOR: | Geo-Tech Explorations | 12-Sep-01 | 12-Sep-01 |
| PROJECT: 5237 | | | | |

| | |
|---|---|
| BORING DIAMETER: | 10-inch |
| CASING DIAMETER: | 2-inch ID |
| SURFACE ELEVATION: | Not Measured |
| TOP OF CASING ELEVATION: | Not Measured |

| WELL CONSTRUCTION DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS TOTAL PAHs (ppm) | SPLIT SPOON BLOW COUNT | RECOVERY (%) | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Colorado 10-20 Sand Pack<br>2-inch ID 0.020-inch Stainless Steel Slotted Screen<br>Cap | | | | | | | 21<br>22<br>23<br>24<br>25<br>26<br>27<br>28<br>29<br>30<br>31<br>32<br>33<br>34<br>35<br>36<br>37<br>38<br>39<br>40 | 9/12/01 | SP<br>ML<br>SM | Boring terminated at 33.0 feet bgs<br>Monitoring well installed to 33.0 feet bgs<br><br>Materials:<br>0.5-feet PVC sump/end cap<br>10 feet 2-inch diameter, 0.010-inch PVC slotted screen<br>23 feet 2-inch diameter PVC blank casing<br>12 50# bags 10/20 Colorado sand<br>9 50# bags bentonite chips<br>1 locking cap<br>Flush steel monument |



SCOEPA00010949

**APPENDIX D**

**Monitoring Well Construction Log:**

**WS-8-59**



SCOEPA00010950

| HAHN & ASSOCIATES, INC. | MONITORING WELL NUMBER | WS-8-59 | | |
|---|---|---|---|---|
| 434 NW Sixth Avenue | OWRD # | | | |
| Portland, Oregon | | | | |
| (503) 796-0717 | HAI LOGGER: | Jill Bets | DRILL START | DRILL FINISH |
| PROJECT: | SAMPLING METHOD: | 1.5-inch OD Split Spoon | | |
| RI / Source Control Evaluation | DRILLING METHOD: | 6 1/4-inch ID Hollow Stem Auger | Time: | Time: |
| Wacker Siltronic Corporation Property | EQUIPMENT TYPE | B-59 Mobil Drill | 9:30 | 14:57 |
| Portland, Oregon | DRILLER: | Armando Paco | Date: | Date: |
| PROJECT: 5237 | DRILLING CONTRACTOR: | Geo-Tech Explorations | 12-Sep-01 | 12-Sep-01 |

| WELL CONSTRUCTION DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS TOTAL PAHs (ppm) | SPLIT SPOON BLOW COUNT | RECOVERY (%) | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Flush Monument | | | | | | | | | | Ground surface |
| Concrete | | | | | | | 1 | | | NOTE: For full Soil Description, see log for boring P-3, installed approximately 5 feet to the north of WS-8-59. |
| | | | | | | | 2 | | | |
| | | | | | | | 3 | | | |
| | | | | | | | 4 | | | |
| | | | | | | | 5 | | SP | |
| Bentonite Chips | | | | | | | 6 | | | |
| | | | | | | | 7 | | | |
| | | | | | | | 8 | | | |
| | | | | | | | 9 | | | |
| | | | | | | | 10 | | | |
| 2-inch ID Blank Schedule 40 PVC | | | | | | | 11 | | | |
| | | | | | | | 12 | | | |
| | | | | | | | 13 | | | |
| | | | | | | | 14 | | | |
| | | | | | | | 15 | | | |
| | | | | | | | 16 | | | |
| Bentonite Grout | | | | | | | 17 | | | |
| | | | | | | | 18 | | SP | |
| | | | | | | | 19 | | | |
| | | | | | | | 20 | | | |



SCOEPA00010951

| HAHN & ASSOCIATES, INC.<br>434 NW Sixth Avenue<br>Portland, Oregon<br>(503) 796-0717 | **MONITORING WELL NUMBER** | **WS-8-59** | |
|---|---|---|---|
| | **OWRD #** | | |
| PROJECT:<br>RI / Source Control Evaluation<br>Wacker Siltronic Corporation Property<br>Portland, Oregon<br>PROJECT: 5237 | HAI LOGGER: | Jill Bets | DRILL START Time: 9:30 / DRILL FINISH Time: 14:57 |
| | SAMPLING METHOD: | 1.5-inch OD Split Spoon | |
| | DRILLING METHOD: | 6 1/4-inch ID Hollow Stem Auger | |
| | EQUIPMENT TYPE | B-59 Mobil Drill | |
| | DRILLER: | Armando Paco | Date: 12-Sep-01 / Date: 12-Sep-01 |
| | DRILLING CONTRACTOR: | Geo-Tech Explorations | |

| WELL CONSTRUCTION DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS TOTAL PAHs (ppm) | SPLIT SPOON BLOW COUNT | RECOVERY (%) | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout<br>2-inch ID Blank Schedule 40 PVC | | | | | | | 21<br>22<br>23<br>24<br>25<br>26<br>27<br>28<br>29<br>30<br>31<br>32<br>33<br>34<br>35<br>36<br>37<br>38<br>39<br>40 | 9/12/01 | SP<br>ML<br>SM | |

BORING DIAMETER: 10-inch
CASING DIAMETER: 2-inch ID
SURFACE ELEVATION:
TOP OF CASING ELEVATION:



SCOEPA00010952

| HAHN & ASSOCIATES, INC. | MONITORING WELL NUMBER | WS-8-59 | | |
|---|---|---|---|---|
| 434 NW Sixth Avenue | OWRD # | | | |
| Portland, Oregon | | | | |
| (503) 796-0717 | HAI LOGGER: | Jill Bets | DRILL START | DRILL FINISH |
| PROJECT: | SAMPLING METHOD: | 1.5-inch OD Split Spoon | | |
| RI / Source Control Evaluation | DRILLING METHOD: | 6 1/4-inch ID Hollow Stem Auger | Time: | Time: |
| Wacker Siltronic Corporation Property | EQUIPMENT TYPE | B-59 Mobil Drill | 9:30 | 14:57 |
| Portland, Oregon | DRILLER: | Armando Paco | Date: | Date: |
| PROJECT: 5237 | DRILLING CONTRACTOR: | Geo-Tech Explorations | 12-Sep-01 | 12-Sep-01 |

| | |
|---|---|
| BORING DIAMETER: | 10-inch |
| CASING DIAMETER: | 2-inch ID |
| SURFACE ELEVATION: | |
| TOP OF CASING ELEVATION: | |

| WELL CONSTRUCTION DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS TOTAL PAHs (ppm) | SPLIT SPOON BLOW COUNT | RECOVERY (%) | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| Bentonite Grout | | | | | | | | | SM | |
| | | | | | | | 41 | | | |
| | | | | | | | | | SP | |
| | | | | | | | 42 | | | |
| Bentonite Chip Plug | | | | | | | | | SM | |
| | | | | | | | 43 | | | |
| | | | | | | | | | | |
| | | | | | | | 44 | | ML | |
| | | | | | | | | | | |
| | | | | | | | 45 | | | |
| 2-inch ID Blank Schedule 40 PVC | | | | | | | | | SP | Boring terminated at 59.0 feet bgs<br>Monitoring well installed to 59.0 feet bgs<br>Well Pressure Grouted from bentonite plug to 15 feet bgs, remainder sealed with bentonite chips. |
| | | | | | | | 46 | | | |
| | | | | | | | | | | |
| | | | | | | | 47 | | | |
| | | | | | | | | | | |
| | | | | | | | 48 | | | Materials:<br>0.5-feet PVC sump/end cap<br>10 feet 2-inch diameter, 0.010-inch PVC slotted screen<br>50 feet 2-inch diameter PVC blank casing<br>18 50# bags 10/20 Colorado sand<br>14 50# bags bentonite chips<br>110 gallons bentonite grout<br>1 locking cap<br>Flush steel monument |
| | | | | | | | | | | |
| | | | | | | | 49 | | ML | |
| | | | | | | | | | | |
| | | | | | | | 50 | | | |
| | | | | | | | | | | |
| | | | | | | | 51 | | | |
| | | | | | | | | | | |
| | | | | | | | 52 | | | |
| | | | | | | | | | | |
| | | | | | | | 53 | | | |
| | | | | | | | | | SP | |
| | | | | | | | 54 | | | |
| | | | | | | | | | | |
| | | | | | | | 55 | | | |
| | | | | | | | | | | NOTE: Split spoon sample collected at 56 to 57.5 feet bgs indicates Sandy SILT, grey, wet, no sheen, with an approximate 2-inch silt layer just above 57.5 feet bgs. Driller reported approximately 1 foot of heave in the augers prior to collecting this sample, thereby indicating much of the collected split spoon sample is likely representative of the heave originating from the base of the augers. |
| | | | | | | | 56 | | | |
| | - | 11:20 | - | - | 3 | 100 | | | | |
| | | | | | 4 | 100 | 57 | | | |
| | | | | | 13 | 100 | | | ML? | |
| | | | | | | | 58 | | | |
| | | | | | | | | | | NOTE: Split spoon sample collected at 58.5 to 60 feet bgs indicates SAND grey, wet, fine grained, with some silt present, no sheen. Driller reported 4-feet of heave in the augers prior to collecting this sample, thereby indicating the collected split spoon sample is likely representative of the heave originating from the base of the augers. |
| 2-inch ID 0.020-inch Stainless Steel Slotted Screen | | | | | | | | | | |
| Colorado 10-20 Sand Pack | | | | | | | | | | |
| Cap | - | 11:55 | - | - | 3 | 100 | 59 | | SP | |
| | | | | | 4 | 100 | | | | |
| | | | | | 5 | 100 | 60 | | | |



SCOEPA00010953

NW Natural
220 NW 2ND AVENUE
PORTLAND, OR 97209
TEL 503.226.4211
www.nwnatural.com

October 1, 2001

Ms. Cathryn Young
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, OR 97209

Re: Source Control Remediation Investigation – Wacker Sil tronic Site

Dear Cathryn:

This will confirm that on Thursday, September 13, 2001, you asked that we defer installation of the remaining monitoring wells on your property until you are well enough personally to observe the drilling work.

As you are aware, we scheduled these well installations for the week of September 10, while your crystal growing activities were scheduled to be shut down, to accommodate your concerns over the potential impact of drilling vibrations on crystal formation.

We trust that you understand that under these circumstances neither Northwest Natural, nor its consultants or contractors will be liable for vibration-induced interference with your crystals if it becomes necessary to drill the monitoring wells at a time when your crystal growing operations have resumed.

Please advise us if there will be a time in the near future when you may again be suspending crystal growing. If so, we will attempt to schedule the drilling for that time; however, our inability to coordinate our DEQ-mandated schedules with your operations cannot alter our position on responsibility.

Very truly yours,

Robert J. Wyatt, R.G.
Environmental Compliance Specialist

Cc: Eric Blischke
Sandra K. Hart
Robert Ede
Richard D. Bach

**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL CONSULTANTS

September 7, 2001

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland OR 97201-4987

HAI Project No. 5237

SUBJECT: August 2001 Progress Report for Remedial Investigation (RI) Activities, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. Blischke:

Hahn and Associates, Inc. (HAI) has prepared this Progress Report summarizing RI work activities that have occurred relating to the Wacker Siltronic Corporation (Wacker) property during the month of August 2001. RI field activities are being conducted as per the approved *Final Focused Remedial Investigation (RI) Work Plan*[1] prepared for the site. This Progress Report has been prepared as per an Order (DEQ No. ECVC-NWR-00-27) issued jointly to both NW Natural and Wacker by the Oregon Department of Environmental Quality (ODEQ), dated October 4, 2000.

As per the referenced Order, monthly progress reports are to be prepared by the 15th day of each month, with the reporting to continue for the duration of the project. This is the eleventh monthly Progress Report for this project.

**Summary of Activities in August 2001**

With receipt of ODEQ approval of the RI Work Plan, and finalization of the site access agreement between Wacker and NW Natural on July 26, 2001, field activities associated with the Work Plan (e.g., geophysical and push probe sampling activities) were initiated on August 1, 2001. Geophysical activities were completed on August 3, 2001, while push probe investigation activities and surface soil sampling activities were completed on August 21, 2001. Light rain began falling at the site on August 21, 2001, intensifying overnight to a sufficient magnitude such that all stormwater sampling activities proposed in the RI Work Plan were successfully completed during the morning of August 22, 2001. Climatological data (Portland International Airport) indicates that 0.75 inches of precipitation fell in Portland during this storm event, the first measurable precipitation event since July 30, 2001.

[1] Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1, 2001.

434 NW 6th AVENUE, SUITE 203 • PORTLAND, OREGON 97209-3651
503/796-0717 OFFICE • 503/227-2209 FAX
www.hahnasoc.com

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**Anticipated Activities in September and October 2001**

As required by ODEQ Order No. ECVC-NWR-00-27, site characterization activities are to be completed 120 days from receipt of Work Plan approval. With approval of the RI Work Plan by the ODEQ on June 26, 2001, this equates to a field work completion date of October 24, 2001.

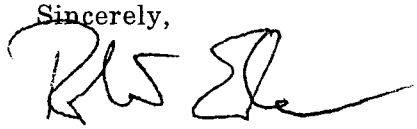
Due to a shut-down of Wacker's crystal growing activities currently scheduled for the week of September 10, 2001, efforts will be made to evaluate monitoring well placement needs for the Wacker property such that well installations may be able to proceed during the scheduled shut-down. The timing of any such well installation activities to coincide with the scheduled plant shut-down would be beneficial since Wacker's concerns related to potential drill rig vibration impacts to crystal integrity would not exist during this time-frame. In an effort to adhere to this desired schedule, a meeting with representatives of NW Natural and the ODEQ has been established for Friday, September 7 such that proposed well placement and design may be discussed and agreed upon.

Based on the preceding schedule, it is anticipated that installation, development, and surveying associated with all new monitoring wells at Wacker should be complete by September 21, 2001. The initial round of groundwater sampling activities from all new wells, set to coincide with sampling activities at the adjacent Gasco site, is scheduled to occur during the week of September 24, 2001.

In addition to the preceding, other remaining RI activities to be completed at the site include: 1) an inspection and survey of the base of the drainage ditch located immediately west and south of the Wacker property; 2) completion of aquifer slug tests on select newly installed monitoring wells; 3) development and implementation of a plan for conducting a continuous short-term (48 hours) groundwater elevation monitoring event; and 4) development of a long-term (1 year) quarterly monitoring plan for newly installed monitoring wells at the Wacker site. It is anticipated that the these final investigatory activities and plans will be completed by October 19, 2001.

If the foregoing report is acceptable to the ODEQ, there is no need to respond.

Sincerely,



Robert Ede, R.G.
Sr. Project Manager

rede@hahnasoc.com

c: Mr. Bob Wyatt, NW Natural
Mr. Richard Bach, Stoel Rives LLP
Mr. Carl Stivers, Anchor Environmental, L.L.C.
Ms. Cathryn Young, Wacker Siltronic Corporation



SCOEPA00010956

WACKER
Wacker Siltronic Corporation

P.O. Box 83180
Portland, Oregon 97283-0180
Phone: (503) 243-2020
Fax: (503) 241-7599

## LETTER OF TRANSMITTAL

**DATE:** September 5, 2001

**FROM:** Cathryn Young

**TO:** Oregon Department of Environmental Quality

**ATTN:** Eric Blischke

**SUBJECT:** Catch Basin Samples Analytical Report

**PROJECT:** Remedial Investigation Wacker Siltronic Property

The following document is transmitted for your use:

Coffey Laboratories Report Number A10621BI, July 5, 2001

Copies: Rob Ede, Hahn and Associates
Kathi Futornick, Limno-tech, Inc.

Reed:
7/9/01

Report Date: July 5, 2001
Job Number: A10621BI
PO Number: 4500075102
Project No: 01-71-72
Project Name: None Provided

Tom Rothschild
Wacker Siltronic
7200 NW Front Avenue
Portland, OR 97210-3676

**Analytical Narrative**

The sample was received on 06/21/01 by Coffey Laboratories, Inc. (CLI) Sample Reception personnel under strict chain of custody protocol. The following information was provided at the time of sample reception:

| Laboratory Sample ID | Field Identification | Matrix | Collection Date | Collection Time |
|---|---|---|---|---|
| A10621BI-1 | 01-71a CDA CATCH BASIN | Soil | 06/19/01 | 1400 |
| A10621BI-2 | 01-71b Chrome shed catch Basin | Soil | 06/19/01 | 1400 |
| A10621BI-3 | CLI Composite 1-2 | Soil | 06/19/01 | COMP |
| A10621BI-4 | 01-72 Field sample | Water | 06/19/01 | 1400 |

The recommended holding time for each batch of analyses was in accordance with the data quality objectives as specified in the CLI Quality Assurance Plan unless otherwise noted.

Acceptable precision and accuracy were achieved for all analyses associated with this work order as demonstrated by the recoveries of the quality control samples analyzed concurrently with each batch.

The data submitted in this report is for the sole and exclusive use of the above-named client. All samples associated with the work order will be retained a maximum of 15 days from the report date or until the maximum holding time expires. All results pertain only to samples submitted.

Thank you for allowing Coffey Laboratories to be of service to you. If you have questions or need further assistance, please do not hesitate to call our Customer Services Department.

Sincerely,

Rapheda Kovacs

Technical Services

TS /atc

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-3
Field ID: CLI Composite 1-2
Date/Time: 06/19/01 COMP
Matrix: Soil

EPA Category: Conventional Parameters

| Parameter | Method | Detection Limit | Analytical Result | Units |
|---|---|---|---|---|
| Total Organic Carbon | EPA 415.1 | 0.8 | 13000. E | mg/Kg |
| Total Cyanide | EPA 9010 | 0.25 | 0.4 | mg/Kg |

E means Estimated Concentration

**Coffey Laboratories, Inc.**
12423 N.E. Whitaker Way • Portland, OR • 97230 • (503) 254-1794 • FAX (503) 254-1452

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-3
Field ID: CLI Composite 1-2
Date/Time: 06/19/01 COMP
Matrix: Soil

EPA Category: Metals

| Parameter | Method | Detection Limit | Analytical Result | Units |
|---|---|---|---|---|
| Antimony | EPA 6020 | 0.5 | ND | mg/Kg |
| Arsenic | EPA 6020 | 0.25 | 1.1 | mg/Kg |
| Barium | EPA 6020 | 0.05 | 46. | mg/Kg |
| Cadmium | EPA 6020 | 0.1 | 0.55 | mg/Kg |
| Chromium | EPA 6020 | 0.5 | 13. | mg/Kg |
| Cobalt | EPA 6020 | 0.05 | 4.4 | mg/Kg |
| Copper | EPA 6020 | 0.25 | 32. | mg/Kg |
| Iron | EPA 6010 | 25 | 10000. | mg/Kg |
| Lead | EPA 6020 | 0.1 | 16. | mg/Kg |
| Magnesium | EPA 6010 | 2.5 | 1400. | mg/Kg |
| Manganese | EPA 6010 | 5.0 | 110. | mg/Kg |
| Mercury | EPA 7471 | 0.01 | 0.02 | mg/Kg |
| Nickel | EPA 6020 | 0.25 | 8.3 | mg/Kg |
| Selenium | EPA 6020 | 0.5 | ND | mg/Kg |
| Silver | EPA 6020 | 0.1 | 1.3 | mg/Kg |
| Thallium | EPA 6020 | 0.05 | ND | mg/Kg |
| Titanium | EPA 6020 | 10. | 430. | mg/Kg |
| Vanadium | EPA 6020 | 0.05 | 25. | mg/Kg |
| Zinc | EPA 6020 | 5. | 360. | mg/Kg |

ND means none detected at or above the detection limit listed.

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-3
Field ID: CLI Composite 1-2
Date/Time: 06/19/01 COMP
Matrix: Soil

EPA Category: Volatile Organics
Analysis Performed: EPA 8260; Volatile Organics by GC/MS.
Analysis Date: 06/26/01
Analyst: MRD

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| Acetone | 5.22 | ND | ND |
| Benzene | 1.74 | ND | ND |
| Bromobenzene | 1.74 | ND | ND |
| Bromochloromethane | 1.74 | ND | ND |
| Bromodichloromethane | 1.74 | ND | ND |
| Bromoform | 1.74 | ND | ND |
| Bromomethane | 1.74 | ND | ND |
| 2-Butanone (MEK) | 1.74 | ND | ND |
| n-Butylbenzene | 1.74 | ND | ND |
| sec-Butylbenzene | 1.74 | ND | ND |
| tert-Butylbenzene | 1.74 | ND | ND |
| Carbon Disulfide | 1.74 | ND | ND |
| Carbon tetrachloride | 1.74 | ND | ND |
| Chlorobenzene | 1.74 | ND | ND |
| Chloroethane | 1.74 | ND | ND |
| 2-Chloroethylvinyl ether | 1.74 | ND | ND |
| Chloroform | 1.74 | ND | ND |
| Chloromethane | 1.74 | ND | ND |
| 2-Chlorotoluene | 1.74 | ND | ND |
| 4-Chlorotoluene | 1.74 | ND | ND |
| 1,2-Dibromo-3-chloropropane | 1.74 | ND | ND |
| Dibromochloromethane | 1.74 | ND | ND |
| 1,2-Dibromoethane | 1.74 | ND | ND |
| Dibromomethane | 1.74 | ND | ND |
| 1,2-Dichlorobenzene | 1.74 | ND | ND |
| 1,3-Dichlorobenzene | 1.74 | ND | ND |
| 1,4-Dichlorobenzene | 1.74 | ND | ND |
| Dichlorodifluoromethane | 1.74 | ND | ND |
| 1,1-Dichloroethane | 1.74 | ND | ND |
| 1,2-Dichloroethane | 1.74 | ND | ND |

Results expressed as mg/kg unless otherwise noted.
ND means none detected at or above the detection limit listed.

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-3
Field ID: CLI Composite 1-2
Date/Time: 06/19/01 COMP
Matrix: Soil

EPA Category: Volatile Organics
Analysis Performed: EPA 8260; Volatile Organics by GC/MS.
Analysis Date: 06/26/01
Analyst: MRD

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| 1,1-Dichloroethene | 1.74 | ND | ND |
| cis-1,2-Dichloroethene | 1.74 | ND | ND |
| trans-1,2-Dichloroethene | 1.74 | ND | ND |
| 1,2-Dichloropropane | 1.74 | ND | ND |
| 1,3-Dichloropropane | 1.74 | ND | ND |
| 2,2-Dichloropropane | 1.74 | ND | ND |
| 1,1-Dichloropropene | 1.74 | ND | ND |
| cis-1,3-Dichloropropene | 1.74 | ND | ND |
| trans-1,3-Dichloropropene | 1.74 | ND | ND |
| Ethylbenzene | 1.74 | ND | ND |
| Hexachlorobutadiene | 1.74 | ND | ND |
| 2-Hexanone | 1.74 | ND | ND |
| Iodomethane | 1.74 | ND | ND |
| Isopropylbenzene | 1.74 | ND | ND |
| 4-Isopropyltoluene | 1.74 | ND | ND |
| 4-Methyl-2-pentanone | 1.74 | ND | ND |
| Methylene chloride | 1.74 | ND | ND |
| Naphthalene | 1.74 | ND | ND |
| n-Propylbenzene | 1.74 | ND | ND |
| Styrene | 1.74 | ND | ND |
| 1,1,1,2-Tetrachloroethane | 1.74 | ND | ND |
| 1,1,2,2-Tetrachloroethane | 1.74 | ND | ND |
| Tetrachloroethene | 1.74 | ND | ND |
| Toluene | 1.74 | ND | 10. |
| 1,2,3-Trichlorobenzene | 1.74 | ND | ND |
| 1,2,4-Trichlorobenzene | 1.74 | ND | ND |
| 1,1,1-Trichloroethane | 1.74 | ND | ND |
| 1,1,2-Trichloroethane | 1.74 | ND | ND |
| Trichloroethene | 1.74 | ND | ND |
| Trichlorofluoromethane | 1.74 | ND | ND |

Results expressed as mg/kg unless otherwise noted.
ND means none detected at or above the detection limit listed.

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-3
Field ID: CLI Composite 1-2
Date/Time: 06/19/01 COMP
Matrix: Soil

EPA Category: Volatile Organics
Analysis Performed: EPA 8260; Volatile Organics by GC/MS.
Analysis Date: 06/26/01
Analyst: MRD

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| 1,2,3-Trichloropropane | 1.74 | ND | ND |
| 1,2,4-Trimethylbenzene | 1.74 | ND | ND |
| 1,3,5-Trimethylbenzene | 1.74 | ND | ND |
| Vinyl acetate | 1.74 | ND | ND |
| Vinyl chloride | 1.74 | ND | ND |
| m,p-Xylene | 3.48 | ND | ND |
| o-Xylene | 1.74 | ND | ND |
| 4-Bromofluorobenzene (Surr.) | --- | --- | 99% |
| Dibromofluoromethane (Surr.) | --- | --- | 100% |
| Toluene-d8 (Surr.) | --- | --- | 102% |

Results expressed as mg/kg unless otherwise noted.
ND means none detected at or above the detection limit listed.

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-3
Field ID: CLI Composite 1-2
Date/Time: 06/19/01 COMP
Matrix: Soil

EPA Category: Extractable Organics
Analysis Performed: EPA 8270; Semivolatile Organics by GC/MS.
Analysis Date: 06/30/01
Analyst: AB

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| Acenaphthene | 69. | ND | ND |
| Acenaphthylene | 69. | ND | ND |
| Aldrin | 69. | ND | ND |
| Anthracene | 69. | ND | ND |
| Azobenzene | 58. | ND | ND |
| 1,2-Diphenylhydrazine | 58. | ND | ND |
| Benzo(a)anthracene | 69. | ND | ND |
| Benzo(a)pyrene | 69. | ND | ND |
| Benzo(b)fluoranthene | 69. | ND | ND |
| Benzo(g,h,i)perylene | 69. | ND | ND |
| Benzo(k)fluoranthene | 69. | ND | ND |
| beta-BHC | 69. | ND | ND |
| delta-BHC | 69. | ND | ND |
| bis(2-Chloroethoxy)methane | 69. | ND | ND |
| bis(2-Chloroethyl)ether | 69. | ND | ND |
| bis(2-Chloroisopropyl)ether | 69. | ND | ND |
| Bis(2-ethylhexyl)phthalate | 69. | ND | ND |
| 4-Bromophenyl phenyl ether | 69. | ND | ND |
| Butyl benzyl phthalate | 69. | ND | ND |
| 4-Chloro-3-methylphenol | 69. | ND | ND |
| 2-Chloronaphthalene | 69. | ND | ND |
| 2-Chlorophenol | 69. | ND | ND |
| 4-Chlorophenyl phenyl ether | 69. | ND | ND |
| Chrysene | 69. | ND | ND |
| 4,4-DDD | 69. | ND | ND |
| 4,4-DDE | 69. | ND | ND |
| 4,4-DDT | 69. | ND | ND |
| Di-n-butylphthalate | 69. | ND | ND |
| Di-n-octylphthalate | 69. | ND | ND |
| Dibenzo(a,h)anthracene | 69. | ND | ND |

Results expressed as mg/kg unless otherwise noted.
ND means none detected at or above the detection limit listed.



SCOEPA00010964

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-3
Field ID: CLI Composite 1-2
Date/Time: 06/19/01 COMP
Matrix: Soil

EPA Category: Extractable Organics
Analysis Performed: EPA 8270; Semivolatile Organics by GC/MS.
Analysis Date: 06/30/01
Analyst: AB

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| 1,2-Dichlorobenzene | 69. | ND | ND |
| 1,4-Dichlorobenzene | 69. | ND | ND |
| 1,3-Dichlorobenzene | 69. | ND | ND |
| 2,4-Dichlorophenol | 69. | ND | ND |
| Dieldrin | 69. | ND | ND |
| Diethyl phthalate | 69. | ND | ND |
| 2,4-Dimethylphenol | 69. | ND | ND |
| Dimethylphthalate | 69. | ND | ND |
| 2,4-Dinitrophenol | 138. | ND | ND |
| 2,4-Dinitrotoluene | 69. | ND | ND |
| 2,6-Dinitrotoluene | 69. | ND | ND |
| Endosulfan sulfate | 69. | ND | ND |
| Endrin Aldehyde | 69. | ND | ND |
| Fluoranthene | 69. | ND | ND |
| Fluorene | 69. | ND | ND |
| Heptachlor | 69. | ND | ND |
| Heptachlor epoxide | 69. | ND | ND |
| Hexachlorobenzene | 69. | ND | ND |
| Hexachlorobutadiene | 69. | ND | ND |
| Hexachloroethane | 69. | ND | ND |
| Indeno(1,2,3-cd)pyrene | 69. | ND | ND |
| Isophorone | 69. | ND | ND |
| 2-Methyl-4,6-dinitrophenol | 69. | ND | ND |
| N-Nitrosodi-n-propylamine | 69. | ND | ND |
| Naphthalene | 69. | ND | ND |
| Nitrobenzene | 69. | ND | ND |
| 4-Nitrophenol | 69. | ND | ND |
| 2-Nitrophenol | 69. | ND | ND |
| Pentachlorophenol | 69. | ND | ND |
| Phenanthrene | 69. | ND | ND |

Results expressed as mg/kg unless otherwise noted.
ND means none detected at or above the detection limit listed.

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-3
Field ID: CLI Composite 1-2
Date/Time: 06/19/01 COMP
Matrix: Soil

EPA Category: Extractable Organics
Analysis Performed: EPA 8270; Semivolatile Organics by GC/MS.
Analysis Date: 06/30/01
Analyst: AB

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| Phenol | 69. | ND | ND |
| Pyrene | 69. | ND | ND |
| 1,2,4-Trichlorobenzene | 69. | ND | ND |
| 2,4,6-Trichlorophenol | 69. | ND | ND |
| 2-Fluorobiphenyl (Surr.) | --- | --- | Diluted out of range |
| 2-Fluorophenol (Surr.) | --- | --- | Diluted out of range |
| Nitrobenzene-d5 (Surr.) | --- | --- | Diluted out of range |
| Phenol-d6 (Surr.) | --- | --- | Diluted out of range |
| Terphenyl-d14 (Surr.) | --- | --- | Diluted out of range |
| 2,4,6-Tribromophenol (Surr.) | --- | --- | Diluted out of range |

Results expressed as mg/kg unless otherwise noted.
ND means none detected at or above the detection limit listed.



SCOEPA00010966

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-3
Field ID: CLI Composite 1-2
Date/Time: 06/19/01 COMP
Matrix: Soil

EPA Category: Extractable Organics
Analysis Performed: EPA 8270 SIM; Polynuclear Aromatic Hydrocarbons by SIM GC/MS
Analysis Date: 06/29/01
Analyst: AB

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| Acenaphthene | 0.17 | ND | ND |
| Acenaphthylene | 0.17 | ND | ND |
| Anthracene | 0.17 | ND | ND |
| Benzo(a)anthracene | 0.17 | ND | 0.2 |
| Benzo(a)pyrene | 0.17 | ND | 0.2 |
| Benzo(b)fluoranthene | 0.17 | ND | 0.3 |
| Benzo(g,h,i)perylene | 0.17 | ND | 0.2 |
| Benzo(k)fluoranthene | 0.17 | ND | 0.2 |
| Chrysene | 0.17 | ND | 0.3 |
| Dibenzo(a,h)anthracene | 0.17 | ND | ND |
| Fluoranthene | 0.17 | ND | 0.4 |
| Fluorene | 0.17 | ND | ND |
| Indeno(1,2,3-cd)pyrene | 0.17 | ND | 0.2 |
| Naphthalene | 0.17 | ND | ND |
| Phenanthrene | 0.17 | ND | 0.2 |
| Pyrene | 0.17 | ND | 0.4 |
| Decafluorobiphenol (Surr.) | --- | --- | Diluted out of range |

Results expressed as mg/kg unless otherwise noted.
ND means none detected at or above the detection limit listed.

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-3
Field ID: CLI Composite 1-2
Date/Time: 06/19/01 COMP
Matrix: Soil

EPA Category: Extractable Organics
Analysis Performed: NW TPH-Dx; TPH quantitative semi-volatile petroleum products
Analysis Date: 06/27/01
Analyst: MKM

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| Diesel | 2200. | ND | ND |
| Hydrocarbons heavier than C24 | 2200. | ND | 9000. |
| o-Terphenyl (Surr.) | --- | --- | Diluted out of range |

Results expressed as mg/kg unless otherwise noted.
ND means none detected at or above the detection limit listed.

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-4
Field ID: 01-72
Date/Time: 06/19/01 1400
Matrix: Water

EPA Category: Conventional Parameters

| Parameter | Method | Detection Limit | Analytical Result | Units |
|---|---|---|---|---|
| Total Cyanide | EPA 335.2 | 0.1 | ND | mg/L |
| Total Organic Carbon | EPA 415.1 | 0.8 | ND | mg/L |

ND means none detected at or above the detection limit listed.

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SCOEPA00010969

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-4
Field ID: 01-72
Date/Time: 06/19/01 1400
Matrix: Water

EPA Category: Metals

| Parameter | Method | Detection Limit | Analytical Result | Units |
|---|---|---|---|---|
| Antimony | EPA 200.8 | 0.01 | ND | mg/L |
| Arsenic | EPA 200.8 | 0.005 | ND | mg/L |
| Barium | EPA 200.8 | 0.001 | ND | mg/L |
| Cadmium | EPA 200.8 | 0.002 | ND | mg/L |
| Chromium | EPA 200.8 | 0.01 | ND | mg/L |
| Cobalt | EPA 200.8 | 0.001 | ND | mg/L |
| Copper | EPA 200.8 | 0.005 | ND | mg/L |
| Iron | EPA 200.7 | 0.5 | ND | mg/L |
| Lead | EPA 200.8 | 0.002 | ND | mg/L |
| Magnesium | EPA 200.7 | 0.05 | ND | mg/L |
| Manganese | EPA 200.7 | 0.1 | ND | mg/L |
| Mercury | EPA 245.1 | 0.005 | ND | mg/L |
| Nickel | EPA 200.8 | 0.005 | ND | mg/L |
| Selenium | EPA 200.8 | 0.05 | ND | mg/L |
| Silver | EPA 200.8 | 0.005 | ND | mg/L |
| Thallium | EPA 200.8 | 0.001 | ND | mg/L |
| Titanium | EPA 200.8 | 0.02 | ND | mg/L |
| Vanadium | EPA 200.8 | 0.001 | ND | mg/L |
| Zinc | EPA 200.8 | 0.01 | ND | mg/L |

ND means none detected at or above the detection limit listed.

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-4
Field ID: 01-72
Date/Time: 06/19/01 1400
Matrix: Water

EPA Category: Volatile Organics
Analysis Performed: EPA 8260; Volatile Organics by GC/MS.
Analysis Date: 06/26/01
Analyst: MRD

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| Acetone | 15. | ND | ND |
| Benzene | 5. | ND | ND |
| Bromobenzene | 5. | ND | ND |
| Bromochloromethane | 5. | ND | ND |
| Bromodichloromethane | 5. | ND | ND |
| Bromoform | 5. | ND | ND |
| Bromomethane | 5. | ND | ND |
| 2-Butanone (MEK) | 5. | ND | ND |
| n-Butylbenzene | 5. | ND | ND |
| sec-Butylbenzene | 5. | ND | ND |
| tert-Butylbenzene | 5. | ND | ND |
| Carbon Disulfide | 5. | ND | ND |
| Carbon tetrachloride | 5. | ND | ND |
| Chlorobenzene | 5. | ND | ND |
| Chloroethane | 5. | ND | ND |
| 2-Chloroethylvinyl ether | 5. | ND | ND |
| Chloroform | 5. | ND | ND |
| Chloromethane | 5. | ND | ND |
| 2-Chlorotoluene | 5. | ND | ND |
| 4-Chlorotoluene | 5. | ND | ND |
| 1,2-Dibromo-3-chloropropane | 5. | ND | ND |
| Dibromochloromethane | 5. | ND | ND |
| 1,2-Dibromoethane | 5. | ND | ND |
| Dibromomethane | 5. | ND | ND |
| 1,2-Dichlorobenzene | 5. | ND | ND |
| 1,3-Dichlorobenzene | 5. | ND | ND |
| 1,4-Dichlorobenzene | 5. | ND | ND |
| Dichlorodifluoromethane | 5. | ND | ND |
| 1,1-Dichloroethane | 5. | ND | ND |
| 1,2-Dichloroethane | 5. | ND | ND |

Results expressed as $\mu$g/L unless otherwise noted.
ND means none detected at or above the detection limit listed.

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-4
Field ID: 01-72
Date/Time: 06/19/01 1400
Matrix: Water

EPA Category: Volatile Organics
Analysis Performed: EPA 8260; Volatile Organics by GC/MS.
Analysis Date: 06/26/01
Analyst: MRD

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| 1,1-Dichloroethene | 5. | ND | ND |
| cis-1,2-Dichloroethene | 5. | ND | ND |
| trans-1,2-Dichloroethene | 5. | ND | ND |
| 1,2-Dichloropropane | 5. | ND | ND |
| 1,3-Dichloropropane | 5. | ND | ND |
| 2,2-Dichloropropane | 5. | ND | ND |
| 1,1-Dichloropropene | 5. | ND | ND |
| cis-1,3-Dichloropropene | 5. | ND | ND |
| trans-1,3-Dichloropropene | 5. | ND | ND |
| Ethylbenzene | 5. | ND | ND |
| Hexachlorobutadiene | 5. | ND | ND |
| 2-Hexanone | 5. | ND | ND |
| Iodomethane | 5. | ND | ND |
| Isopropylbenzene | 5. | ND | ND |
| 4-Isopropyltoluene | 5. | ND | ND |
| 4-Methyl-2-pentanone | 5. | ND | ND |
| Methylene chloride | 5. | ND | 12. |
| Naphthalene | 5. | ND | ND |
| n-Propylbenzene | 5. | ND | ND |
| Styrene | 5. | ND | ND |
| 1,1,1,2-Tetrachloroethane | 5. | ND | ND |
| 1,1,2,2-Tetrachloroethane | 5. | ND | ND |
| Tetrachloroethene | 5. | ND | ND |
| Toluene | 5. | ND | ND |
| 1,2,3-Trichlorobenzene | 5. | ND | ND |
| 1,2,4-Trichlorobenzene | 5. | ND | ND |
| 1,1,1-Trichloroethane | 5. | ND | ND |
| 1,1,2-Trichloroethane | 5. | ND | ND |
| Trichloroethene | 5. | ND | ND |
| Trichlorofluoromethane | 5. | ND | ND |

Results expressed as µg/L unless otherwise noted.
ND means none detected at or above the detection limit listed.



SCOEPA00010972

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-4
Field ID: 01-72
Date/Time: 06/19/01 1400
Matrix: Water

EPA Category: Volatile Organics
Analysis Performed: EPA 8260; Volatile Organics by GC/MS.
Analysis Date: 06/26/01
Analyst: MRD

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| 1,2,3-Trichloropropane | 5. | ND | ND |
| 1,2,4-Trimethylbenzene | 5. | ND | ND |
| 1,3,5-Trimethylbenzene | 5. | ND | ND |
| Vinyl acetate | 5. | ND | ND |
| Vinyl chloride | 5. | ND | ND |
| m,p-Xylene | 10. | ND | ND |
| o-Xylene | 5. | ND | ND |
| 4-Bromofluorobenzene (Surr.) | --- | --- | 99% |
| Dibromofluoromethane (Surr.) | ---. | --- | 102% |
| Toluene-d8 (Surr.) | ---. | --- | 102% |

Results expressed as $\mu$g/L unless otherwise noted.
ND means none detected at or above the detection limit listed.

Note: The sample was not in a preserved zero head space vial. The Methylene chloride could possibly be due to laboratory contaminations the sample was shared for other analytical methods.



SCOEPA00010973

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-4
Field ID: 01-72
Date/Time: 06/19/01 1400
Matrix: Water

EPA Category: Extractable Organics
Analysis Performed: EPA 8270; Semivolatile Organics by GC/MS.
Analysis Date: 06/27/01
Analyst: AB

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| Acenaphthene | 0.12 | ND | ND |
| Acenaphthylene | 0.12 | ND | ND |
| Aldrin | 0.12 | ND | ND |
| Anthracene | 0.12 | ND | ND |
| Benzo(a)anthracene | 0.12 | ND | ND |
| Benzo(a)pyrene | 0.12 | ND | ND |
| Benzo(b)fluoranthene | 0.12 | ND | ND |
| Benzo(g,h,i)perylene | 0.12 | ND | ND |
| Benzo(k)fluoranthene | 0.12 | ND | ND |
| beta-BHC | 0.12 | ND | ND |
| delta-BHC | 0.12 | ND | ND |
| bis(2-Chloroethoxy)methane | 0.12 | ND | ND |
| bis(2-Chloroethyl)ether | 0.12 | ND | ND |
| bis(2-Chloroisopropyl)ether | 0.12 | ND | ND |
| Bis(2-ethylhexyl)phthalate | 0.12 | ND | ND |
| 4-Bromophenyl phenyl ether | 0.12 | ND | ND |
| Butyl benzyl phthalate | 0.12 | ND | ND |
| 4-Chloro-3-methylphenol | 0.12 | ND | ND |
| 2-Chloronaphthalene | 0.12 | ND | ND |
| 2-Chlorophenol | 0.12 | ND | ND |
| 4-Chlorophenyl phenyl ether | 0.12 | ND | ND |
| Chrysene | 0.12 | ND | ND |
| 4,4-DDD | 0.12 | ND | ND |
| 4,4-DDE | 0.12 | ND | ND |
| 4,4-DDT | 0.12 | ND | ND |
| Di-n-butylphthalate | 0.12 | ND | ND |
| Di-n-octylphthalate | 0.12 | ND | ND |
| Dibenzo(a,h)anthracene | 0.12 | ND | ND |
| 1,2-Dichlorobenzene | 0.12 | ND | ND |
| 1,4-Dichlorobenzene | 0.12 | ND | ND |

Results expressed as mg/L unless otherwise noted.
ND means none detected at or above the detection limit listed.

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-4
Field ID: 01-72
Date/Time: 06/19/01 1400
Matrix: Water

EPA Category: Extractable Organics
Analysis Performed: EPA 8270; Semivolatile Organics by GC/MS.
Analysis Date: 06/27/01
Analyst: AB

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| 1,3-Dichlorobenzene | 0.12 | ND | ND |
| 2,4-Dichlorophenol | 0.12 | ND | ND |
| Dieldrin | 0.12 | ND | ND |
| Diethyl phthalate | 0.12 | ND | ND |
| 2,4-Dimethylphenol | 0.12 | ND | ND |
| Dimethylphthalate | 0.12 | ND | ND |
| 2,4-Dinitrophenol | 0.24 | ND | ND |
| 2,4-Dinitrotoluene | 0.12 | ND | ND |
| 2,6-Dinitrotoluene | 0.12 | ND | ND |
| Endosulfan sulfate | 0.12 | ND | ND |
| Endrin Aldehyde | 0.12 | ND | ND |
| Fluoranthene | 0.12 | ND | ND |
| Fluorene | 0.12 | ND | ND |
| Heptachlor | 0.12 | ND | ND |
| Heptachlor epoxide | 0.12 | ND | ND |
| Hexachlorobenzene | 0.12 | ND | ND |
| Hexachlorobutadiene | 0.12 | ND | ND |
| Hexachloroethane | 0.12 | ND | ND |
| Indeno(1,2,3-cd)pyrene | 0.12 | ND | ND |
| Isophorone | 0.12 | ND | ND |
| 2-Methyl-4,6-dinitrophenol | 0.12 | ND | ND |
| N-Nitrosodi-n-propylamine | 0.12 | ND | ND |
| Naphthalene | 0.12 | ND | ND |
| Nitrobenzene | 0.12 | ND | ND |
| 4-Nitrophenol | 0.12 | ND | ND |
| 2-Nitrophenol | 0.12 | ND | ND |
| Pentachlorophenol | 0.12 | ND | ND |
| Phenanthrene | 0.12 | ND | ND |
| Phenol | 0.12 | ND | ND |
| Pyrene | 0.12 | ND | ND |

Results expressed as mg/L unless otherwise noted.
ND means none detected at or above the detection limit listed.

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-4
Field ID: 01-72
Date/Time: 06/19/01 1400
Matrix: Water

EPA Category: Extractable Organics
Analysis Performed: EPA 8270; Semivolatile Organics by GC/MS.
Analysis Date: 06/27/01
Analyst: AB

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| 1,2,4-Trichlorobenzene | 0.12 | ND | ND |
| 2,4,6-Trichlorophenol | 0.12 | ND | ND |
| 2-Fluorobiphenyl (Surr.) | --- | --- | 95% |
| 2-Fluorophenol (Surr.) | --- | --- | 60% |
| Nitrobenzene-d5 (Surr.) | --- | --- | 90% |
| Phenol-d6 (Surr.) | --- | --- | 39% |
| Terphenyl-d14 (Surr.) | --- | --- | 115% |
| 2,4,6-Tribromophenol (Surr.) | --- | --- | 80% |

Results expressed as mg/L unless otherwise noted.
ND means none detected at or above the detection limit listed.



SCOEPA00010976

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-4
Field ID: 01-72
Date/Time: 06/19/01 1400
Matrix: Water

EPA Category: Extractable Organics
Analysis Performed: EPA 8270 SIM; Polynuclear Aromatic Hydrocarbons by SIM GC/MS
Analysis Date: 06/29/01
Analyst: AB

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| Acenaphthene | 2. | ND | ND |
| Acenaphthylene | 2. | ND | ND |
| Anthracene | 2. | ND | ND |
| Benzo(a)anthracene | 2. | ND | ND |
| Benzo(a)pyrene | 2. | ND | ND |
| Benzo(b)fluoranthene | 2. | ND | ND |
| Benzo(g,h,i)perylene | 2. | ND | ND |
| Benzo(k)fluoranthene | 2. | ND | ND |
| Chrysene | 2. | ND | ND |
| Dibenzo(a,h)anthracene | 2. | ND | ND |
| Fluoranthene | 2. | ND | ND |
| Fluorene | 2. | ND | ND |
| Indeno(1,2,3-cd)pyrene | 2. | ND | ND |
| Naphthalene | 2. | ND | ND |
| Phenanthrene | 2. | ND | ND |
| Pyrene | 2. | ND | ND |
| Decafluorobiphenol (Surr.) | --- | --- | 70% |

Results expressed as $\mu$g/L unless otherwise noted.
ND means none detected at or above the detection limit listed.

## Analytical Data

Wacker Siltronic

Job Number: A10621BI


Lab Sample ID: A10621BI-4
Field ID: 01-72
Date/Time: 06/19/01 1400
Matrix: Water

EPA Category: Extractable Organics
Analysis Performed: NW TPH-Dx; TPH quantitative semi-volatile petroleum products
Analysis Date: 06/27/01
Analyst: MKM

| Parameter | Detection Limit | Laboratory Blank | Analytical Result |
|---|---|---|---|
| Diesel | 2.5 | ND | ND |
| Hydrocarbons heavier than C24 | 5. | ND | ND |
| o-Terphenyl (Surr.) | --- | --- | 120% |

Results expressed as mg/l unless otherwise noted.
ND means none detected at or above the detection limit listed.

**Coffey Laboratories, Inc.**
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SCOEPA00010978

# COFFEY LABORATORIES, INC.
## CHAIN OF CUSTODY AGREEMENT


CENTRAL OREGON BRANCH
827 SW 7th
Redmond, OR 97756
PHONE/FAX (541) 548-0972

CORPORATE HEADQUARTERS
12423 NE Whitaker Way
Portland, OR 97230
(503) 254-1794 FAX: (503) 254-1452

EASTERN OREGON BRANCH
419 SW 5th
Pendleton, OR 97801
PHONE/FAX (541) 276-0385


Report Attention: Tom Rothschild
Company Name: Wacker Siltronic
Mailing Address: 7200 N.W. Front Ave
Portland, OR
Phone: (503) 219-7374 FAX: (503) 417-4144

Report Instructions (Special - Additional- Job Specific):

PO Number: 4500075102
Project Number: 01-71-72
Project Name:
EPA Protocol Containers: (Y)N Other:

Sample Turnaround
- [x] Standard
- [ ] Priority (Additonal Fee)
- [ ] Rush (Additional Fee)
- [ ] Emergency (Additional Fee)

Reporting Request
- [ ] State Compliance Format
- [ ] FAX Results - Preliminary
- [x] FAX Results-Final
- [ ] Verbals Results
- [ ] Extra Report Copy (Fees Associated)

Initials: Di

FOR LABORATORY USE ONLY Page ____ of ____
Job Number:
Custabbr: ☐NEW
☐ VISA ☐ M/C Cardholder:
Card #: Exp: / /
Cash / Check / CC:$ #:
Billing Code: 1 2 3 4
QC LEVEL: 1 2 3 4
FEDX BUS COURIERS UPS LAB CLIENT MAIL AIR

| Sample ID | Loc. | ID | # | Collection Date | Collection Time | Media | Analysis Requested | Test/ Profile |
|---|---|---|---|---|---|---|---|---|
| 01-71-a-b-c Di | | | 2 ~~3~~ Di | 6.19.01 | 1400 | Soil | NW-TPH Dx, EPA: 8021B, 8260B | |
| | | | | | | | 8270C, 8270 SIM, 6010/200.7 | |
| | | | | | | | 7470.A, 415.1 and 9010. | |
| 01-72 | | | 1 | 6.19.01 | 1400 | liquid | NW-TPH Dx, EPA: 8021B, 8260B | |
| | | | | | | | 8270C, 8270 SIM, 6010/200.7 | |
| | | | | | | | 7470A, 415.1 and 9010. | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

Sampled By: Tom McCall Jim Claxton
AUTHORIZED CUSTOMER SIGNATURE Dianne Irish DATE: June 19 - 01

| Sample Comments | Relinquished by: (Please Sign) | Date | Time | Received by: (Sign) | Date | Time |
|---|---|---|---|---|---|---|
| * See attached sheet for method detail. Please call for needed Clarification | Jim Claxton | 6/19/01 | 2:23 | Dianne Irish | 6/19/01 | 2:23 |
| | [signature] | 6/19/01 | 2:23 | LAB [signature] | 6/21/01 | 1015 |

White Copy-Laboratory Yellow Copy - Customer

COMPLETE THIS FORM PER INSTRUCTIONS ON REVERSE SIDE

SUBMISSION OF SAMPLES WITH TESTING REQUIREMENTS TO CLI WILL BE UNDERSTOOD TO BE AN AGREEMENT FOR SERVICES IN ACCORDANCE WITH THE CONDITIONS LISTED ON THE BACK OF THE CLIENT COPY.

SCOEPA00010979

## TABLE 1
## Sample Container, Preservation, and Holding Time Requirements

Remedial Investigation Sampling and Analysis Plan
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Method Number | Technique | Sample Matrix | Sample Container | Preservation | Holding Time |
|---|---|---|---|---|---|
| **NW TPH-Dx**<br>Diesel-range and Oil-range Quantification | GC/FID | Soil | 9-ounce glass jar | Cool to 4 C | extract within 14 days |
| | | Water | 1-liter glass amber bottle | Cool to 4 C | extract within 7 days |
| **EPA Method 8021B**<br>Benzene, Toluene, Ethylbenzene, Xylene | GC/PID | Soil | 9-ounce glass jar | Cool to 4 C | 14 days |
| | | Water | (3) 40-ml VOA vials | Cool to 4 C<br>HCl pH<2 | 14 days |
| **EPA Method 8260B**<br>Volatile Organic Compounds (VOCs) | GC/MS | Soil | 9-ounce glass jar | Cool to 4 C | 14 days |
| | | Water | (3) 40-ml VOA vials | Cool to 4 C<br>HCl pH<2 | 14 days |
| **EPA Method 8270C**<br>Semivolatile Organic Compounds (SVOCs)<br>**EPA 8270 SIM**<br>Polynuclear Aromatic Hydrocarbons (PAHs) | GC/MS | Soil | 9-ounce glass jar | Cool to 4 C | 14 days |
| | | Water | 1-liter glass amber bottle | Cool to 4 C | extract within 7 days |
| **EPA Method 6010/200.7**<br>Antimony, barium, chromium, cobalt, iron, magnesium, nickel, selenium, silver, titanium, vanadium, zinc | ICP | Soil | 9-ounce glass jar | Cool to 4 C | 6 months |
| | | Water | 1-liter plastic | Cool to 4 C<br>$HNO_3$ | 6 months |
| **EPA Method 7470A**<br>Mercury | Cold Vapor Analyzer | Soil | 8-ounce glass jar | Cool to 4 C | 23 days |
| **EPA Method 245.1**<br>Mercury | Cold Vapor Analyzer | Water | 1-liter plastic | Cool to 4 C<br>$HNO_3$ | 23 days |
| **EPA Method 300**<br>Chloride | Ion Exchange | Water | 100 ml plastic | Cool to 4 C | 28 days |
| **EPA Method 415.1**<br>Total Organic Carbon | Ion Exchange | Soil | 9-ounce glass jar | Cool to 4 C | 28 days |
| **EPA 9010**<br>Cyanide, Total | Colorimetric | Soil | 9-ounce glass jar | NaOH | 14 days |
| | | Water | 500 ml plastic | NaOH | 14 days |

NOTE:
C = degrees centigrade
EPA = U.S. Environmental Protection Agency
FID = flame ionization detector
GC= gas chromatography
HCl = hydrochloric acid
HNO3 = nitric acid
ICP = inductively coupled plasma
ml = milliliter
NW = Northwest Method
MS = mass spectrogaphy
PID = photo ionization detector
SIM = single ion monitoring
NaOH = sodium hydroxide
TPH = total petroleum hydrocarbons
VOA = volatile organic analyses



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**TABLE 4**
**Proposed Soil Sampling and Analytical Summary**

Remedial Investigation Work Plan
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, Oregon

Project No. 5237

| Proposed Sample Location | Depth of Boring (feet bgs) | Area | Soil Core Interval | Soil Samples Selected for Field Screening | Soil Samples Selected for Analyses | Analytical Parameters |
|---|---|---|---|---|---|---|
| P-1 | 64 | River Embankment | Continuous to 64 feet | 1 per 4-foot soil core | One surface and one subsurface sample to be selected based on field screening | Surface: SVOCs, metals[1], cyanide; Subsurface: HCID[2], metals, cyanide TOC |
| P-2 | 100 | River Embankment | Continuous to 64 feet, every 10 feet below | 1 per 4-foot soil core | One sample to be selected based on field screening | HCID[2], metals, cyanide, TOC |
| P-3 | 100 | River Embankment | Continuous to 64 feet, every 10 feet below | 1 per 4-foot soil core | One surface and one subsurface sample to be selected based on field screening | Surface: SVOCs, metals[1], cyanide; Subsurface: HCID[2], metals, cyanide TOC |
| P-4 | 64 | River Embankment | Continuous to 64 feet | 1 per 4-foot soil core | One sample to be selected based on field screening | HCID[2], metals, cyanide, TOC |
| P-5 | 100 | River Embankment | Continuous to 64 feet, every 10 feet below | 1 per 4-foot soil core | One surface and one subsurface sample to be selected based on field screening | Surface: SVOCs, metals[1], cyanide; Subsurface: HCID[2], metals, cyanide TOC |
| P-6 | 64 | River Embankment | Continuous to 64 feet | 1 per 4-foot soil core | One sample to be selected based on field screening | HCID[2], metals, cyanide, TOC |
| P-7 | 64 | River Embankment | Continuous to 64 feet | 1 per 4-foot soil core | One surface and one subsurface sample to be selected based on field screening | Surface: SVOCs, metals[1], cyanide; Subsurface: HCID[2], metals, cyanide TOC |
| P-8 | 100 | River Embankment | Continuous to 64 feet, every 10 feet below | 1 per 4-foot soil core | One sample to be selected based on field screening | HCID[2], metals, cyanide, TOC |
| P-9 | 64 | River Embankment | Continuous to 64 feet | 1 per 4-foot soil core | One surface and one subsurface sample to be selected based on field screening | Surface: SVOCs, metals[1], cyanide; Subsurface: HCID[2], metals, cyanide TOC |
| P-10 | 20 | River Embankment | Continuous to 20 feet | 1 per 4-foot soil core | One sample to be selected based on field screening | HCID[2], metals, cyanide, TOC |
| Beneath Fab 2 Stormwater Outfall | N/A | River Embankment | N/A | N/A | One surface sample | VOCs, SVOCs, metals[1], cyanide, TOC |
| Stormwater Catch Basins | - | Wacker Process Area | N/A | N/A | One sample from each catch basin, to be composited by the laboratory into one sample for analysis | VOCs, SVOCs, metals[1], cyanide, TOC |
| Duplicate | N/A | River Embankment | N/A | N/A | One analyzed sample from boring P-8 | HCID[2], metals, cyanide, TOC |
| **Total** | 740 | - | 161 | 161 | 18 Samples | - |

NOTE:

bgs = below ground surface
EPA = U. S. Environmental Protection Agency
HCID = hydrocarbon identification
PAHs = polynuclear aromatic hydrocarbons
SVOCs = semi-volatile organic compounds, including PAHs
TOC = total organic compound
VOCs = volatile organic compounds

1= metals: Sb, As, Cd, Co, Cr, Cu, Fe, Pb, Mn, Ni, Se, Ag, Ti, V, Zn
2= HCID will be used to determine presence of petroleum or organic impact. If present, impact will be quantified via Northwest Methods and select samples will further be analyzed for VOCs and SVOCs.

Updated: 6/25/01 RBE
File: 5237-04 Soil SAP.xls



SCOEPA00010981

**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL CONSULTANTS

August 15, 2001

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland OR 97201-4987

HAI Project No. 5237

SUBJECT: July 2001 Progress Report for Remedial Investigation (RI) Activities, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. Blischke:

Hahn and Associates, Inc. (HAI) has prepared this Progress Report summarizing RI work activities that have occurred relating to the Wacker Siltronic Corporation (Wacker) property during the month of July 2001. This Progress Report has been prepared as per an Order (DEQ No. ECVC-NWR-00-27) issued jointly to both NW Natural and Wacker by the Oregon Department of Environmental Quality (ODEQ), dated October 4, 2000.

As per the referenced Order, monthly progress reports are to be prepared by the 15th day of each month, with the reporting to continue for the duration of the project. This is the tenth monthly Progress Report for this project.

**Summary of Activities in July 2001**

The month of July was primarily spent developing the site access agreement between Wacker and NW Natural. As a result of these efforts, a Limited Access Agreement allowing NW Natural access to the Wacker property for the purpose of conducting RI activities as described within the approved Final Focused Remedial Investigation (RI) Work Plan[1] was finalized and became effective on July 26, 2001.

**Anticipated Activities in August and September 2001**

As required by ODEQ Order No. ECVC-NWR-00-27, site characterization activities are to be completed 120 days from receipt of Work Plan approval. With approval of the RI Work Plan by the ODEQ on June 26, 2001, this equates to a field work completion date of October 24, 2001.

With receipt of ODEQ approval of the RI Work Plan, and finalization of the site access agreement between Wacker and NW Natural on July 26, 2001, field activities associated with the Work Plan (e.g., geophysical and push probe sampling activities) were initiated

[1] Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon,* June 1, 2001.



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on August 1, 2001. Geophysical activities were completed on August 3, 2001, while it is anticipated that push probe investigation activities (ongoing) will be complete by Tuesday, August 21, 2001.

Due to a shut-down of Wacker's crystal growing activities currently scheduled for the week of September 9, 2001, efforts will be made to evaluate monitoring well placement needs for the Wacker property such that any necessary wells located on the northern portion of the property (near the crystal growing operations) may be able to proceed during the scheduled shut-down. The timing of any such well installation activities to coincide with the scheduled plant shut-down would be beneficial since Wacker's concerns related to potential drill rig vibration impacts to crystal integrity would not exist during this time-frame.

If the foregoing report is acceptable to the ODEQ, there is no need to respond.

Sincerely,

Robert Ede, R.G.
Sr. Project Manager

Rede@hahnasoc.com

c: Mr. Bob Wyatt, NW Natural
Mr. Richard Bach, Stoel Rives LLP
Mr. Carl Stivers, Anchor Environmental, L.L.C.
Ms. Cathryn Young, Wacker Siltronic Corporation



SCOEPA00010983

**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL CONSULTANTS

December 15, 2003

Mr. Matt McClincy
Oregon Department of Environmental Quality
Northwest Region, Portland Office
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland Oregon 97201-4987

HAI Project No. 5237

**SUBJECT: November 2003 Progress Report for Remedial Investigation (RI) Activities, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon**

Dear Mr. McClincy:

Hahn and Associates, Inc. (HAI) has prepared this Progress Report summarizing RI work activities conducted by NW Natural that have occurred relating to the Wacker Siltronic Corporation (Wacker) property during the month of November 2003. RI field activities for the site have been conducted as per the approved Final Focused Remedial Investigation (RI) Work Plan[1] (RI Work Plan), as well as the approved Supplemental RI Work Plan[2]. This Progress Report has been prepared as per an Order (DEQ No. ECVC-NWR-00-27) issued jointly to both NW Natural and Wacker by the Oregon Department of Environmental Quality (DEQ), dated October 4, 2000. As per the referenced Order, monthly progress reports are to be prepared by the 15th day of each month, with the reporting to continue for the duration of the project.

## Summary of Activities in November 2003

City Outfall 22C Evaluation

In correspondence dated November 3, 2003 (Mr. Matt McClincy to Mr. Bob Wyatt and Ms. Cathryn Young), DEQ provided comments concerning NW Natural's October 13, 2003 Work Plan for additional City Outfall 22C evaluation. Representatives of NW Natural and DEQ met on November 26, 2003 to discuss DEQ's comments and possible approaches to completing the City Outfall 22C component of the source control investigation, as it relates to the Wacker property.

During the meeting it was learned that a substantial amount of additional investigation activities related to Outfall 22C were either underway or were planned by AMEC Earth &

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[1] Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1, 2001.

[2] Hahn and Associates, Inc. (2002). *Supplemental Remedial Investigation Work Plan, Wacker Siltronic Corporation,, 7200 NW Front Avenue, Portland, Oregon.* March 7, 2002.



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Environment, Inc. (AMEC) as part of the adjacent Rhone-Poulenc RI. Further, it was discovered that the City of Portland may have completed, or will be completing, sediment sampling and clean-out within the unnamed ditch that leads to Outfall 22C. Although a work plan for the investigation activities to be conducted by AMEC was available, information related to the City's sampling or clean-out activities were not available. It was agreed that NW Natural would contact the City to ascertain what investigation or other activities, they intended to conduct with regard to Outfall 22C or the unnamed drainage ditch adjacent to the Wacker property. Further, it was agreed that a coordinated effort, avoiding duplication, would be appropriate due to the various multi-party issues surrounding City Outfall 22C.

RI Summary Report and Preliminary Source Control Evaluation Report

The *Phase I Site Characterization Summary Report*, prepared by HAI and dated November 7, 2003, as well as the *Preliminary Source Control Evaluation Report*, prepared by Anchor Environmental, L.L.C., and dated November 2003, were delivered to DEQ on November 7, 2003.

**Anticipated / Completed Activities in December 2003 and January 2004**

After gaining information regarding the City of Portland's plans (investigation and/or clean-out) with regard to the unnamed drainage ditch adjacent t the Wacker property, NW Natural will prepare a response to DEQ's November 3, 2003 correspondence, including a revised Work Plan for Outfall 22C evaluation. Such a plan is anticipated in late December 2003, or early January 2003.

Once approval with regard to a scope of work regarding investigation activities relating to City Outfall 22C has been received from DEQ, all efforts will be made to expedite execution of the appropriate access agreement with the Burlington Northern Santa Fe Railroad Company (BNSF). Further, once these additional data are collected, then an addendum to the *Phase I Site Characterization Summary Report*, will be prepared.

Should you have any questions, please contact the undersigned.

Sincerely,

Robert Ede, R.G.
Associate

rede@hahnasoc.com

c: Mr. Bob Wyatt, NW Natural
Ms. Patty Dost, Schwabe, Williamson & Wyatt
Ms. Cheryl Rath, Schwabe, Williamson & Wyatt
Mr. Carl Stivers, Anchor Environmental, L.L.C.
Ms. Cathryn Young, Wacker Siltronic Corporation

WACKER SILTRONIC

**CATHRYN YOUNG**
SENIOR MANAGER
ENVIRONMENTAL AFFAIRS

**Wacker Siltronic Corporation**
7200 N.W. Front Avenue, MS 30
Portland, OR 97210-3676, USA
Tel. 503-219-7406
Fax 503-219-7599
cathryn.young@wacker.com

# FAX

December 19, 2003

**To** Chris Reive
Jordan Schrader

**From** Cathryn Young

**Fax** 503-598-7373

4 Page(s) incl. coversheet

HAI November 2003 Progress Report

**HAHN AND ASSOCIATES, INC.**
ENVIRONMENTAL CONSULTANTS

November 14, 2003

Mr. Matt McClincy
Oregon Department of Environmental Quality
Northwest Region, Portland Office
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland Oregon 97201-4987

HAI Project No. 5237

**SUBJECT: October 2003 Progress Report for Remedial Investigation (RI) Activities, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon**

Dear Mr. McClincy:

Hahn and Associates, Inc. (HAI) has prepared this Progress Report summarizing RI work activities conducted by NW Natural that have occurred relating to the Wacker Siltronic Corporation (Wacker) property during the month of October 2003. RI field activities for the site have been conducted as per the approved Final Focused Remedial Investigation (RI) Work Plan[1] (RI Work Plan), as well as the approved Supplemental RI Work Plan[2]. This Progress Report has been prepared as per an Order (DEQ No. ECVC-NWR-00-27) issued jointly to both NW Natural and Wacker by the Oregon Department of Environmental Quality (DEQ), dated October 4, 2000. As per the referenced Order, monthly progress reports are to be prepared by the 15th day of each month, with the reporting to continue for the duration of the project.

## Summary of Activities in October 2003

In correspondence dated September 9, 2003 (Mr. Matt McClincy to Mr. Bob Wyatt), DEQ provided comments generated from review of NW Natural's August 13, 2003 Off-Site Drainage Ditch / City Outfall 22C Source Control Evaluation. In this correspondence, DEQ requested the completion of additional investigation activities relating to the off-site drainage ditch / City Outfall 22C.

On October 13, 2003, HAI submitted a detailed response to DEQ's September 9, 2003 correspondence, including a Work Plan for completion of additional investigation activities relating to City Outfall 22C.

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[1] Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1, 2001.

[2] Hahn and Associates, Inc. (2002). *Supplemental Remedial Investigation Work Plan, Wacker Siltronic Corporation,, 7200 NW Front Avenue, Portland, Oregon.* March 7, 2002.

434 NW 6th AVENUE, SUITE 203 • PORTLAND, OREGON 97209-3651
503-796-0717 Telephone • 503-227-2209 Facsimile

**Anticipated / Completed Activities in November and December 2003**

City Outfall 22C Evaluation

In correspondence dated November 3, 2003 (Mr. Matt McClincy to Mr. Bob Wyatt and Ms. Cathryn Young), DEQ provided comments concerning NW Natural's October 13, 2003 Work Plan for additional City Outfall 22C evaluation. As discussed with DEQ during a November 12, 2003 telephone conversation (Mr. Rob Ede to Mr. Matt McClincy) NW Natural and DEQ have agreed to a meeting to review sampling and characterization strategies related to City Outfall 22C. At this time, NW Natural and DEQ are working towards establishing a meeting during the week of November 24, 2003.

Once approval with regard to a scope of work regarding investigation activities relating to City Outfall 22C has been received from DEQ, all efforts will be made to expedite execution of the appropriate access agreement with the Burlington Northern Santa Fe Railroad Company (BNSF). Further, once these additional data are collected, then an addendum to the *Phase I Site Characterization Summary Report*, as described below, will be prepared.

RI Summary Report and Preliminary Source Control Evaluation Report

The *Phase I Site Characterization Summary Report*, prepared by HAI and dated November 7, 2003, as well as the *Preliminary Source Control Evaluation Report*, prepared by Anchor Environmental, L.L.C., and dated November 2003, were delivered to DEQ on November 7, 2003.

Should you have any questions, please contact the undersigned.

Sincerely,

Robert Ede, R.G.
Associate

rede@hahnasoc.com

c: Mr. Bob Wyatt, NW Natural
Ms. Patty Dost, Schwabe, Williamson & Wyatt
Ms. Cheryl Rath, Schwabe, Williamson & Wyatt
Mr. Carl Stivers, Anchor Environmental, L.L.C.
Ms. Cathryn Young, Wacker Siltronic Corporation

Oregon
Theodore R. Kulongoski, Governor

Department of Environmental Quality
Northwest Region Portland Office
2020 SW 4th Avenue, Suite 400
Portland, OR 97201-4987
(503) 229-5263
FAX (503) 229-6945
TTY (503) 229-5471

November 3, 2003

**CERTIFIED MAIL**

Mr. Bob Wyatt
Northwest Natural
220 NW Second Avenue
Portland, OR 97209

Ms. Cathryn Young
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, OR 97210

Re: Draft Work Plan for City Outfall 22C Evaluation
Wacker Siltronic Corporation Property
ECSI No. 183

Dear Bob and Cathryn:

The Oregon Department of Environmental Quality (DEQ) received Hahn and Associates, Inc. (HAI) October 13, 2003 draft work plan for the evaluation of the off-site ditch and City Outfall 22C. The work plan is not approved. In accordance with Section 6B(2)(b) of DEQ Order No. ECVC-NWR-00-27 the work plan should be modified to correct the following deficiencies.

1. Add columns in the screening criteria table (e.g., Table 1) for ambient water quality criteria (AWQC) and DEQ Level II Screening Values (SLVs) that do not employ a multiplier. Contaminant concentrations in the discharge from City Outfall 22C that are interpreted to be groundwater are to be screened directly against AWQC and SLVs. Concentrations measured during a "storm event" (i.e., discharge from this outfall representative of stormwater) which in this case is a combination of groundwater and stormwater, are to be screened employing the multiplier of 5.

2. Modify the work plan scope of work to include:
   - Collection of an effluent sample from City Outfall 22C during a dry interval (i.e., at least 7 days subsequent to the previous storm event) during the dry season (Summer/Fall). This sample was requested in DEQ's September 9, 2003 letter to confirm the levels of contaminants measured at Outfall 22C during dry weather and low groundwater conditions.
   - Collection of surface water samples from the Northwest Drainage Pond (NDP) during the wet and dry season dry interval sampling event at Outfall 22C. While there are a number of existing shallow monitoring wells on the Wacker Siltronics property that could potentially be utilized to determine the contaminant levels in

groundwater discharging to the drainage ditch, the NDP and the City Outfall 22C sewer line (see DEQ scope of work in September 9, 2003 letter), testing both the NDP and the outfall effluent during dry intervals is a reasonable starting point.

- Collect surface (upper 6 inches) sediment from the NDP and at a point midway between the NDP and proposed sample station 03 in the off-site drainage ditch. The previous request by DEQ to characterize the ditch/pond sediment was made to determine if contaminated sediments are present that could potentially be flushed to the Willamette River during a large storm event.

3. Test water/effluent samples for volatile organic compounds, semivolatile organic compounds, total and amenable cyanide and total metals (antimony[1], barium[1], chromium[1], iron[1], manganese[1], mercury[1], nickel[1], selenium[1], silver[1], thallium[1], zinc[1], lead[2] arsenic[2], copper[2] and cadmium[2]).

4. Test sediment samples for semivolatile organic compounds, total and amenable cyanide and metals (antimony[1], barium[1], chromium[1], iron[1], manganese[1], mercury[1], nickel[1], selenium[1], silver[1], thallium[1], zinc[1], lead[2] arsenic[2], copper[2] and cadmium[2]).

While we agree that it is important to quantify the contaminant load entering the off-site ditch system as proposed in the draft plan. DEQ does want to clarify that it will not consider contaminants detected in stormwater leaving the Gasco site (proposed sample station 04) to be "background". Also, additional evaluation of contaminant levels detected in water exiting North Doane Lake (proposed sample location) may be necessary before DEQ can agree to the "background" designation as the nature and extent of shallow groundwater impacts from Gasco-related wastes in this area has not been determined.

Please correct the above deficiencies and resubmit the work plan within 10 calendar days of receipt of this letter. If you have any questions or wish to discus alternative sampling or characterization strategies, please contact me at (503) 229-5538.

Sincerely,

Matt McClincy
Project Manager
Cleanup & Portland Harbor

cc: Rod Struck, DEQ NWR
Jim Anderson, DEQ NWR
Rob Ede, Hahn & Associates
Tom Schadt, Anchor Environmental
Jim Maul, MFA

1. Metals included in June 1, 2001, Hahn and Associates, Inc., Final Focused Remedial Investigation Work Plan Wacker Siltronic Corporation Property 7200 NW Front Avenue Portland, Oregon

2. Metals exceeding screening levels modified Table 1, Hahn and Associates, Inc., October 13, 2003, Draft Work Plan for City Outfall 22C