

## Memorandum

**To:** Sunny Becker, Washington State Department of Ecology  
**Copies:** Bob Code , Glen Dodge, Cascade Columbia, Tom Colligan, Floyd-Snider  
**From:** Tom McKeon, CALIBRE  
**Date:** May 13 2015  
**Project:** Fox Avenue Site

**Re: Technical Memorandum, ERD Treatment/Remedial Optimization of the Fox Avenue Site; May 2015**

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This Technical Memorandum summarizes substrate injections and sampling activities planned for the Fox Avenue Site in May 2015. This memo focuses on one element of the Site Remedial Actions (RA); biological treatment of groundwater using Enhanced Reductive Dechlorination (ERD) in the downgradient plume.

Field activities planned include:

1. Substrate injections to promote ERD in wells located on the Seattle Boiler Works (SBW) property.
2. Monitoring of selected wells and seeps to evaluate ERD performance and develop appropriate remedial optimization measures.

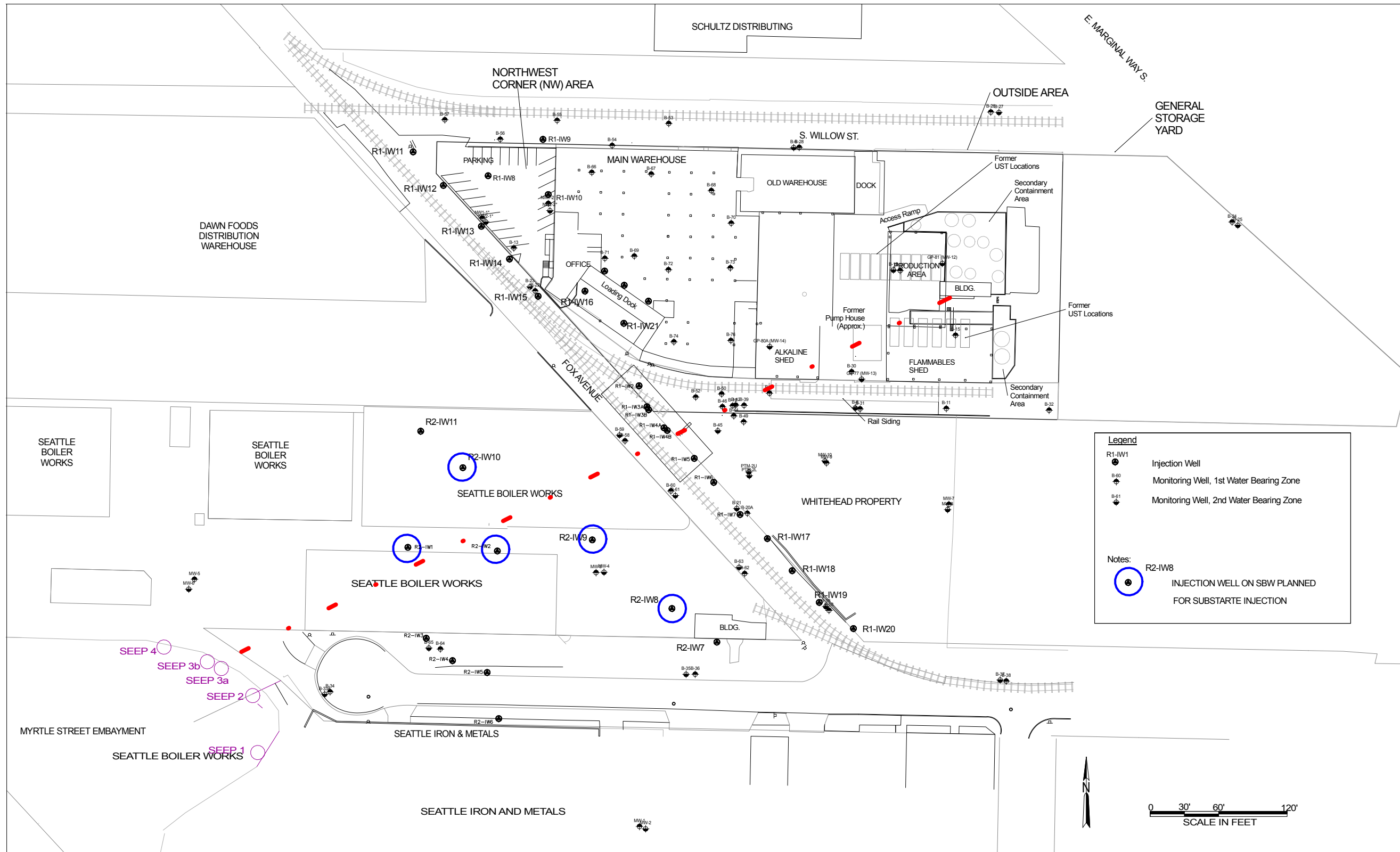
The planned schedule to start the remedial optimization and sampling is May 18 2015 (see note below regarding SBW access).

The planned locations for substrate injections on the SBW property are included in the attached figure. These locations have been selected based on proximity located upgradient from the seep locations and the last round of sampling data. The ERD injection will use approximately 4.5 tons of substrate (sucrose and carbohydrates) mixed with approximately 12,000 gallons of water. All work will be completed in accordance with existing work plans and SOPs submitted for this project.

The planned locations for monitoring well sampling are summarized in the attached table (all well positions are shown in the figure). The sampling will be used to evaluate ERD performance and identify areas requiring substrate injection for continued ERD treatment.

A portion of the work planned and described in this memo requires access to SBW property. Notification to SBW has been provided in accordance with the existing access agreement and the proposed schedule starting May 18, 2015. Final details regarding current SBW use of the areas and corresponding times available for our access are currently being worked out. The final schedules may change depending on specific requirements from SBW.

Please call or e-mail if you have any questions on the enclosed plans (425 241 8449; tom,mckeon@calibresys.com).



Plan View  
Fox Avenue Site  
Seattle, WA

Location of Injection Wells on SBW Planned  
for May 2015 Substrate Injection  
Fox Ave Site

Table 1 - Fox Ave May 2015 Proposed Sampling List

21 Total wells/seeps

Well - Row 1	WBZ	Sample Depth (ft bgs)	Analytes Sampled	Last Sample Date	Total CVOCs (ug/L)	Rationale
R1-IW2	2	60	VOCs, TOC	7/24/2013	169	Verify where substrate is needed in Row 1
R1-IW3a	1	12	VOCs	7/24/2013	924	
R1-IW4a	1	11	VOCs, TOC, Dissolved Gases	7/24/2013	1,675	
R1-IW4b	2	50	VOCs, TOC	7/24/2013	195	
R1-IW17	1	12	VOCs, TOC, Dissolved Gases	10/11/2012	1,176	Monitoring near plume fringe
R1-IW17	2	55	VOCs, TOC	10/11/2012	683	Monitoring near plume fringe
B-18	1	14	VOCs	5/15/2014	319	Monitoring near plume fringe
B-19	2	45	VOCs	5/15/2014	902	Monitoring near plume fringe

Well - Row 2	WBZ	Sample Depth (ft bgs)	Analytes Sampled	Sample Date	Total CVOCs (ug/L)	Rationale
R2-IW1	2	17 and 45	VOCs	5/29/2013	3,400	sample prior to inject. upgradient of seep
R2-IW2	2	17 and 45	VOCs	12/13/2012	37	sample prior to inject. upgradient of seep
R2-IW8	2	63	VOCs, TOC, Dissolved Gases	2/20/2013	8,393	SBW
R2-IW11	1	12	VOCs, TOC	2/20/2013	402	SBW
MW-3	1	10	VOCs	12/13/2012	160	SBW MW
MW-4	2	40	VOCs	12/13/2012	4	SBW MW
R2-IW3	2	30	VOCs	8/17/2012	433	Myrtle St IWs
R2-IW4	2	45	VOCs	10/29/2009	1,118	Myrtle St IWs
B33a	2		VOCs	7/22/2013	2	Myrtle St
B64	1		VOCs	7/22/2013	83	Myrtle St
B65	2		VOCs	7/22/2013	126	Myrtle St
SP-02	Seep	Surface	VOCs	5/16/2014	1.6	Monitoring at point of compliance
SP-03	Seep	Surface	VOCs	5/16/2014	446	Monitoring at point of compliance
SP-04	Seep	Surface	VOCs	5/16/2014	ND	Monitoring at point of compliance