

Memo**Stantec**

To: Shaun Quinn
Alberta Transportation

From: Don Davies
Calgary Office

File: 110860038/4.7

Date: November 07, 2008

**Reference: Turner Valley Gas Plant – Site Protection and Remediation
Project: Iron Oxide Seeps Outside of Erosion Protection Wall
July: 2008**

This memo is in response to a request (November 04, 2008) from Ron Johnson (ACCS) via Shaun Quinn (AT) regarding the Iron Oxide Seeps (Seeps) observed at the Turner Valley Gas Plant in July of 2008. The purpose of this memo is to summarize Stantec activities and findings during that event.

BACKGROUND

Media attention on the Turner Valley Gas plant was focused on an orange precipitate and an oil-like sheen on the surface of the seeps (refer to Attachment A) along the east base of the protection wall adjacent to the Sheep River. It was determined that these observations were the products of iron oxidizing bacteria that is natural and commonly found in groundwater.

This bacterium is largely responsible for orange precipitation (Fe(III) oxyhydroxide) found in surface water bodies and shallow groundwater. It is commonly mistaken for hydrocarbons due to its oil-like sheen resembling oil floating on water. Iron oxidizing bacteria is easily distinguishable from oil as it breaks up into rigid blocks when disturbed.

Stantec (Steve Sterling) was contacted by AENV (Martin Foy) on July 07, 2008. AENV requested Stantec to investigate the event. Stantec visited the site on July 07, 2008.

SAMPLES FROM THE SEEPS

Samples were collected from the seeps on July 07, 2008. Locations where samples were collected are shown on Attachment B. The samples were sent to ALS Laboratory Group on July 07, 2008 for analysis (refer to Attachment C for Sample ID's). Refer to Attachment D for analytical results. Refer to Attachment E for ALS Laboratory Group Analytical Confirmation Sheet.

ANALYTICAL RESULTS

Analytical results of the samples collected from the seeps confirm the absences of hydrocarbons above AENV Tier 1 guidelines (refer to Attachment F). One sample (ID L652055-3 S2) did exceed AENV Tier 1 guidelines for aluminum (0.214 mg/L; guideline 0.1 mg/L).

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DISCUSSION

A comprehensive set of water quality data from the pairs of monitoring wells along the containment wall (refer to 2007 Groundwater Monitoring Report) appears to support that the containment wall is not the likely source of the seeps.

Stantec was requested (ACCS and AT) to attend a presentation to The Town of Turner Valley at a Council meeting (July 21, 2008) as a resource. ACCS, AT, AENV and the Town met (July 21, 2008) to discuss strategy regarding presentation to the Town. ACCS (Catherine Whalley), AT (Sameh Elsayed) and AENV (Martin Foy) made presentations to Town Council. Handouts (Attachments A, B, F and G) were provided to Council members.

CLOSURE

In summary, at the time of the event, physical and chemical data suggests groundwater inside the containment wall is not hydraulically connected to groundwater outside the containment wall.

The appearance of Iron Oxide is more than likely due to naturally occurring iron oxidizing bacteria (refer to Attachment G).

We trust this memo is sufficient for your purposes at this time.

Sincerely,

STANTEC CONSULTING LTD.



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Attachments: A, B, C, D, E, F, and G.

c. Bob Shelast, Ray Lee, Steve Sterling, Stantec Consulting Ltd.

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