

# APPROVAL

## PROVINCE OF ALBERTA

### **ENVIRONMENTAL PROTECTION AND ENHANCEMENT ACT** R.S.A. 2000, c.E-12, as amended.

APPROVAL NO. ..... 19184-01-00

APPLICATION NO. .... 003-19184

EFFECTIVE DATE: ..... March 5, 2010


EXPIRY DATE: ..... March 4, 2020

APPROVAL HOLDER: ..... Alberta Culture and Community Spirit

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.....

ACTIVITY: **RECLAMATION OF THE**  
.....  
Turner Valley Sour Gas Processing Plant  
.....

**IS SUBJECT TO THE ATTACHED TERMS AND CONDITIONS.**

Designated Director under the Act ..... 

Date Signed ..... March 5, 2010

## TERMS AND CONDITIONS ATTACHED TO APPROVAL

### PART 1: DEFINITIONS

#### SECTION 1.1: DEFINITIONS

- 1.1.1 All definitions from the Act and the regulations apply except where expressly defined in this approval.
- 1.1.2 In all PARTS of this approval:
- (a) "Act" means the *Environmental Protection and Enhancement Act*, R.S.A. 2000, c.E-12, as amended;
  - (b) "application" means the written submissions to the Director in respect of application number 003-19184, and the email of March 5, 2010 from Alberta Culture and Community Spirit to Alberta Environment titled "Turner Valley Gas Plant - Approval Application 003-19184";
  - (c) "Director" means an employee of the Government of Alberta designated as a Director under the Act;
  - (d) "ISO/IEC 17025" means the international standard, developed and published by International Organization for Standardization (ISO), specifying management and technical requirements for laboratories;
  - (e) "outside of the containment wall" means the parts of the bed and shore of the Sheep River that have been, or may be, impacted by contaminants from the plant.
  - (f) "plant" means all buildings, structures, process and pollution abatement equipment, vessels, storage facilities, material handling facilities, roadways, railways, pipelines and other installations, and includes the land, located on the north half of Section 6, Township 20, Range 2, West of the 5th Meridian, that is being or has been used or held for or in connection with the Turner Valley Sour Gas Processing Plant;
  - (g) "QA/QC" means quality assurance and quality control;
  - (h) "regulations" means the regulations enacted pursuant to the Act, as amended;
  - (i) "soil" means mineral or organic earthen materials that can, have, or are being altered by weathering, biological processes, or human activity;
  - (j) "year" means calendar year.

## **TERMS AND CONDITIONS ATTACHED TO APPROVAL**

### **PART 2: GENERAL**

#### **SECTION 2.1: GENERAL**

- 2.1.1 The approval holder shall immediately report to the Director by telephone any contravention of the terms and conditions of this approval at 1-780-422-4505.
- 2.1.2 The approval holder shall submit a written report to the Director within 7 days of the reporting pursuant to 2.1.1.
- 2.1.3 The terms and conditions of this approval are severable. If any term or condition of this approval or the application of any term or condition is held invalid, the application of such term or condition to other circumstances and the remainder of this approval shall not be affected thereby.
- 2.1.4 The approval holder shall immediately notify the Director in writing if any of the following events occurs:
- (a) the approval holder is served with a petition into bankruptcy;
  - (b) the approval holder files an assignment in bankruptcy or Notice of Intent to make a proposal;
  - (c) a receiver or receiver-manager is appointed;
  - (d) an application for protection from creditors is filed for the benefit of the approval holder under any creditor protection legislation; or
  - (e) any of the assets which are the subject matter of this approval are seized for any reason.
- 2.1.5 If the approval holder monitors for any substances or parameters which are the subject of operational limits as set out in this approval more frequently than is required and using procedures authorized in this approval, then the approval holder shall provide the results of such monitoring as an addendum to the reports required by this approval.
- 2.1.6 *Environmental Protection and Enhancement Act* Approval No. 19184-00-00 is cancelled.

#### **SECTION 2.2: RECORD KEEPING**

## **TERMS AND CONDITIONS ATTACHED TO APPROVAL**

2.2.1 The approval holder shall record and retain all the following information in respect of any sampling conducted or analyses performed in accordance with this approval for a minimum of ten years, unless otherwise authorized in writing by the Director:

- (a) the place, date and time of sampling;
- (b) the dates the analyses were performed;
- (c) the analytical techniques, methods or procedures used in the analyses;
- (d) the names of the persons who collected and analyzed each sample; and
- (e) the results of the analyses.

### **SECTION 2.3: ANALYTICAL REQUIREMENTS**

2.3.1 With respect to any sample required to be taken pursuant to this approval, the approval holder shall ensure that:

- (a) collection;
- (b) preservation;
- (c) storage;
- (d) handling; and
- (e) analysis

shall be conducted in accordance with the following unless otherwise authorized in writing by the Director:

- (i) for surface water and groundwater:
  - (A) the *Standard Methods for the Examination of Water and Wastewater*, published jointly by the American Public Health Association, American Water Works Association, and the Water Environment Federation, 1998, as amended;
- (ii) for soil:
  - (A) the *Soil Monitoring Directive*, Alberta Environment, May 2009, as amended; and

## TERMS AND CONDITIONS ATTACHED TO APPROVAL

(B) the *Soil Quality Criteria Relative to Disturbance and Reclamation*, Alberta Agriculture, March 1987, as amended;

(iii) for waste:

(A) the *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, USEPA, SW-846, September 1986, as amended;

(B) the *Methods Manual for Chemical Analysis of Water and Wastes*, Alberta Environmental Centre, Vegreville, Alberta, 1996, AECV96-M1 as amended;

(C) the *Toxicity Characteristic Leaching Procedure (TCLP)* USEPA Regulation 40 CFR261, Appendix II, Method No. 1311, as amended; or

(D) the *Standard Methods for the Examination of Water and Wastewater*, American Public Health Association, American Water Works Association, and the Water Environment Federation, as amended.

2.3.2 The approval holder shall analyze all samples that are required to be obtained by this approval in a laboratory accredited pursuant to ISO/IEC 17025, as amended, for the specific parameter(s) to be analyzed, unless otherwise authorized in writing by the Director.

2.3.3 The approval holder shall comply with the terms and conditions of any written authorization issued by the Director under 2.3.2.

### **PART 3: CONSTRUCTION**

Not used.

### **PART 4: ASSESSMENT, MONITORING, AND MANAGEMENT**

#### **SECTION 4.1: RISK ASSESSMENT**

4.1.1 By May 1, 2011, the approval holder shall submit to the Director a proposal for a risk assessment of contaminants outside of the containment wall.

4.1.2 The proposal for the risk assessment referred to in 4.1.1 shall include, at a minimum, all of the following:

## TERMS AND CONDITIONS ATTACHED TO APPROVAL

- (a) a detailed description of each of the steps to be undertaken as part of the risk assessment;
  - (b) timelines for each step;
  - (c) a sampling program to obtain sufficient data for the risk assessment.
- 4.1.3 If the proposal for the risk assessment is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director, within the timeline specified in writing by the Director.
- 4.1.4 The approval holder shall implement the proposal for the risk assessment as authorized in writing by the Director.
- 4.1.5 Within 12 months of completing the risk assessment, the approval holder shall submit a proposal for a risk management plan to the Director.
- 4.1.6 The proposal for the risk management plan referred to in 4.1.4 shall include, at a minimum, all of the following:
- (a) a description of measures to address any risks identified by the risk assessment;
  - (b) timelines for each measure.
- 4.1.7 If the proposal for the risk management plan is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director, within the timeline specified in writing by the Director.
- 4.1.8 The approval holder shall implement the proposal for the risk management plan as authorized in writing by the Director.

### **SECTION 4.2: MONITORING AND MANAGEMENT**

- 4.2.1 The approval holder shall (a) implement, and (b) maintain, all inspection, monitoring, management, and maintenance programs and systems as described in the application, including but not limited to the following:
- (a) the groundwater monitoring program;
  - (b) the groundwater treatment system;
  - (c) the groundwater containment system;
  - (d) the inspection program along the outside of the containment wall;

**TERMS AND CONDITIONS ATTACHED TO APPROVAL**

- (e) the surface water monitoring program;
- (f) the asbestos management program; and
- (g) the mercury management program.

**LIMITS**

- 4.2.2 Releases from the groundwater treatment system shall not exceed the limits for the parameters specified in TABLE 4.2.
- 4.2.3 The approval holder shall monitor any releases from the groundwater treatment system for the parameters in TABLE 4.2, unless otherwise authorized in writing by the Director.
- 4.2.4 The approval holder shall monitor releases from the groundwater treatment system:
  - (a) at the point of discharge from the groundwater treatment system; and
  - (b) at a minimum frequency of monthly.

**TERMS AND CONDITIONS ATTACHED TO APPROVAL****TABLE 4.2: LIMITS**

<b>PARAMETER</b>	<b>LIMITS</b>
<b>General</b>	
pH	6.5-8.5
Sulphate	500 mg/L
<b>Petroleum Hydrocarbons</b>	
Benzene	0.005 mg/L
Toluene	0.024 mg/L
Ethylbenzene	0.0024 mg/L
Xylenes	0.3 mg/L
F1	2.2 mg/L
F2	1.1 mg/L
<b>Polycyclic Aromatic Hydrocarbons</b>	
Acenaphthene	0.0058 mg/L
Acenaphthylene	0.046 mg/L
Anthracene	0.000012 mg/L
Fluoranthene	0.00004 mg/L
Fluorene	0.003 mg/L
Naphthalene	0.0011 mg/L
Phenanthrene	0.0004 mg/L
Pyrene	0.000018 mg/L
Benz(a)anthracene	0.000018 mg/L
Benzo(b+j)fluoranthene	0.00048 mg/L
Benzo(k)fluoranthene	0.00048 mg/L
Benzo(g,h,i)perylene	0.00017 mg/L
Benzo(a)pyrene	0.00001 mg/L
Chrysene	0.0014 mg/L
Dibenz(a,h)anthracene	0.00026 mg/L
Indeno(1,2,3-c,d)pyrene	0.00021 mg/L
<b>Metals</b>	
Total Metals	to be determined through future work



## **TERMS AND CONDITIONS ATTACHED TO APPROVAL**

### **GROUNDWATER SAMPLING**

4.2.5 The approval holder shall collect samples from the groundwater monitor wells using scientifically acceptable purging, sampling and preservation procedures so that a representative groundwater sample is obtained.

4.2.6 The approval holder shall:

- (a) protect from damage; and
- (b) keep locked except when being sampled

all groundwater monitoring wells unless otherwise authorized in writing by the Director.

4.2.7 If a representative groundwater sample cannot be collected because the groundwater monitor well is damaged or is no longer capable of producing a representative groundwater sample the approval holder shall:

- (a) clean, repair or replace the groundwater monitoring well; and
- (b) collect and analyse a representative groundwater sample prior to the next scheduled sampling event

unless otherwise authorized in writing by the Director.

4.2.8 In addition to the sampling information recorded in 2.2.1, the approval holder shall record the following sampling information for all groundwater samples collected:

- (a) a description of purging and sampling procedures;
- (b) the static elevations, above sea level, of fluid phases in the groundwater monitor well prior to purging;
- (c) the temperature of each sample at the time of sampling;
- (d) the pH of each sample at the time of sampling; and
- (e) the specific conductance of each sample at the time of sampling.

### **PART 5: REPORTING**

5.1.1 The approval holder shall submit a Summary Environmental Report to the Director by May 1<sup>st</sup> of each year.

## **TERMS AND CONDITIONS ATTACHED TO APPROVAL**

- 5.1.2 The Summary Environmental Report referred to in 5.1.1, shall include, at a minimum, all of the following information for the previous year:
- (a) the results of the activities conducted during the reporting period, including:
    - (i) all of the items referred to in 4.2.1,
    - (ii) the status of the risk assessment referred to in 4.1.4,
    - (iii) the status of the risk management plan referred to in 4.1.8
    - (iv) a description of the operation and performance of the groundwater treatment system;
    - (v) a description of the operation and performance of the groundwater containment system;
  - (b) plans, and any changes proposed, for the following reporting period;
  - (c) a summary and interpretation of all monitoring data collected for the reporting period;
  - (d) an interpretation of monitoring data collected historically;
  - (e) recommendations for remedial action, if needed; and
  - (f) a summary of any complaints received related to the plant site, and the follow-up actions taken.
- 5.1.3 The groundwater section of the Summary Environmental Report referred to in 5.1.2 shall include, at a minimum, all of the following information for the previous year:
- (a) a completed Record of Site Condition Form, Alberta Environment, 2009, as amended;
  - (b) a legal land description of the plant/facility and a map illustrating the plant/facility boundaries;
  - (c) a topographic map of the plant/facility;
  - (d) a description of the industrial activity and processes;
  - (e) a map showing the location of all surface and groundwater users, and a listing describing surface water and water well use details, within, at a minimum, a three kilometre radius of the plant/facility;

## **TERMS AND CONDITIONS ATTACHED TO APPROVAL**

- (f) a general hydrogeological characterization of the region within, at a minimum, a three kilometre radius of the plant/facility;
- (g) a detailed hydrogeological characterization of the plant/facility; including an interpretation of groundwater flow patterns;
- (h) a cross-section(s) showing depth to water table, patterns of groundwater movement and hydraulic gradients at the plant/facility;
- (i) borehole logs and completion details for groundwater monitoring wells;
- (j) a map showing locations of all known buried channels within, at a minimum, a three km radius of the plant/facility;
- (k) a map of surface drainage within the plant and surrounding area to include nearby waterbodies;
- (l) a map of groundwater monitoring well locations and a table summarizing the existing groundwater monitoring program for the plant/facility;
- (m) a summary of any changes to the groundwater monitoring program made since the last groundwater monitoring report;
- (n) analytical data recorded as required in **4.2.8**
- (o) a summary of fluid elevations recorded as required in **4.2.8(b)** and an interpretation of changes in fluid elevations;
- (p) an interpretation of QA/QC program results;
- (q) an interpretation of all of the data in this report, including the following:
  - (i) diagrams indicating the location and extent of any contamination,
  - (ii) a description of probable sources of contamination, and
  - (iii) a site map showing the location and type of current and historical potential sources of groundwater contamination;
- (r) a summary and interpretation of the data collected since the groundwater monitoring program began including:
  - (i) control charts which indicate trends in concentrations of parameters, and

**TERMS AND CONDITIONS ATTACHED TO APPROVAL**

- (ii) the migration of contaminants;
- (s) a description of the following:
  - (i) contaminated groundwater remediation techniques employed,
  - (ii) source elimination measures employed,
  - (iii) risk assessment studies undertaken, and
  - (iv) risk management studies undertaken;
- (t) a proposed sampling schedule for the following year(s);
- (u) a description of any contaminant remediation, risk assessment or risk management action conducted at the plant/facility; and
- (v) recommendations for changes to the groundwater monitoring program to make it more effective.

5.1.4 If the Summary Environmental Report is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director, within the timeline specified in writing by the Director.

DATED: \_\_\_\_\_  
March 5, 2010

  
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DESIGNATED DIRECTOR UNDER THE ACT

**Ron Johnson**

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**From:** Ron Johnson  
**Sent:** Friday, March 05, 2010 1:33 PM  
**To:** Dave Gower  
**Subject:** FW: Turner Valley Gas Plant - Approval Application 003-19184

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**From:** Ron Johnson  
**Sent:** Friday, March 05, 2010 1:05 PM  
**To:** Dave Gower  
**Subject:** RE: Turner Valley Gas Plant - Approval Application 003-19184

March 5, 2010

Dear Dave,

In respect of the application #003-19184, Alberta Culture and Community Spirit confirms that the items and actions described in the e-mail dated March 2, 2010 from Alberta Environment will be undertaken by ACCS and form part of this application.

Ron Johnson  
Head Restoration and Construction Services  
Historic Places Stewardship  
Culture and Community Spirit  
8820-112 Street, Edmonton, AB., T6G 2P8  
Tel. 780-431-2368  
Cell. 780-717-1133

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**From:** Dave Gower  
**Sent:** Tuesday, March 02, 2010 5:54 PM  
**To:** Ron Johnson  
**Subject:** RE: ACCS Turner Valley Gas Plant - Application for Renewal of Approval 19184 - Conditions in Approval 19184 -01-00

March 2, 2010

Dear Ron,

After reviewing your email of February 7, 2010, and by way of this email, the requirements below are now considered part of the approval application and thereby will be referenced in Approval 19184-01-00. The dates below often refer to the initial submission of plans for various items. As the Approval Holder, Alberta Culture and Community Spirit (ACCS) is required to do the ongoing testing, evaluation, adjustment and reporting for these items until Alberta Environment authorizes otherwise in writing.

**(a) Groundwater Monitoring Program**

Alberta Culture and Community Spirit (ACCS) shall include the following information in the groundwater section of the Summary Environmental Report, to be submitted by the following dates:

(i) by May 1, 2010:

Overall Groundwater Monitoring

- a table that lists monitoring locations, parameters to be sampled, and sampling frequency. A description of the rationale for these items. An explanation of QA/QC procedures and sampling protocols.
- if new wells are proposed, provide a description of protocols to develop the groundwater monitoring wells.
- a diagram that shows monitoring locations and that indicates which wells are installed in each hydrostratigraphic unit.
- a list of, and diagram showing, the status of all monitoring wells; i.e. working condition, no longer in use, not in working order.
- recommendations to decommission monitoring wells that are damaged or no longer potentially useful. Identify any wells that need to be replaced. Propose a timeline to decommission or replace the applicable wells.
- a description of springs present in the area that may be related to offsite movement of contaminants, and an assessment of the need to include them in the monitoring program.

#### LNAPL

- a description of distribution and thickness of LNAPL (light non-aqueous phase liquid).
- ongoing monitoring of LNAPL distribution and thickness.
- an evaluation of options and recommendations for recovery or treatment of LNAPL.

#### Potential for Offsite Movement to the North

- a plan to measure hydraulic conductivity for the bedrock unit and to determine whether or not the bedrock can be classified as a domestic use aquifer, where offsite movement is possible.
- a plan to evaluate groundwater flow in all units where impacts exist (e.g. include the deeper gravel and bedrock units).
- a description of the extent of impacts in the bedrock and deeper sand and gravel aquifer and recommendations for additional delineation in these units if required.
- if there are contaminants identified in the deeper groundwater and bedrock units, and these impacts have the potential to move offsite, then compliance monitoring along the boundaries will be required.

#### Potential for Offsite Movement towards the Town's Water Well

- a plan to resolve the question of the potential for movement of contaminants in the deeper groundwater zones towards the Town's water well.

#### Background Groundwater Conditions for Inorganics

- a plan to evaluate background levels for metals.

#### (ii) by May 1, 2011:

- updated cross-sections that include new borehole/well locations and the containment wall.
- contingency plans in the event that offsite movement of contamination is identified in the following cases: under the weeping tile to the north, coming through the slurry wall, or exceeding guidelines for the effluent from the groundwater treatment system.

#### (b) Monitoring at the Outlet of the Groundwater Treatment System

- The parameters for the effluent will be listed as limits in the Approval.

#### (c) Evaluation of the Effectiveness of the Groundwater Containment System

ACCS shall include the following information in the Summary Environmental Report, to be submitted by May 1, 2010:

- a plan to evaluate the vertical flow gradient near the slurry wall.
- a plan to use groundwater chemistry at paired wells to monitor the success of the containment

wall.

- an update on the tracer test that is being used to test the effectiveness of the wall.

(d) Inspection Program Along the Outside of the Containment Wall

- This program consists of a visual inspection of the containment wall adjacent to the Sheep River basin. These inspections will be done monthly during the seasons of spring, summer and early fall. Winter is generally a time of low groundwater table and inspections are not required. The inspections will look for water seepage from the banks of the containment wall and pools of water on the ground with hydrocarbon sheen or odour. If seepage is found the water will be sampled and analyzed for BTEX and petroleum hydrocarbon fractions F1 – F2. Where there are stains in the sediment that may be due to hydrocarbons, sediment samples will be collected and analyzed for BTEX and petroleum hydrocarbon fractions F1 – F4.

(e) Surface Water Monitoring Program (in the River)

- Surface water sampling shall occur semi-annually.
- The parameters analyzed shall include the following:
  - petroleum hydrocarbon fractions F1 to F4
  - polycyclic aromatic hydrocarbons
  - total metals, including mercury and methyl mercury
  - pH, hardness, temperature

Dave Gower