Appendix B

- EPEA Approval No. 255245-00-00
- EPEA Approval No. 287052-00-00
- Oil Sands Conservation Act Approval No. 11461C (as amended)
- *Water Act* Licence No. 00262149-00-00
- *Hydro and Electric Energy Act* Approval No. U211-107
- *Hydro and Electric Energy Act* and *Electric Utilities Act* Industrial System Designation Order No. U2011-223

Government of Alberta
Environment

APPROVAL

PROVINCE OF ALBERTA

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

APPROVAL NO.: 255245-00-00

APPLICATION NO.: 001-255245

EFFECTIVE DATE: November 19, 2010

EXPIRY DATE: October 31, 2020

APPROVAL HOLDER: Southern Pacific Resource Corp.

ACTIVITY: **CONSTRUCTION, OPERATION AND RECLAMATION OF THE**

McKay enhanced recovery in-situ oilsands or heavy oil processing plant, and thermal electric (cogeneration) power plant,

IS SUBJECT TO THE ATTACHED TERMS AND CONDITIONS.

Designated Director under the Act: _____

Date Signed: November 19, 2010

Alberta

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) "air effluent stream" means any substance in a gaseous medium released by or from a plant;

(c) "affected lands" means lands which have received substances released from the plant;

(d) "annulus gas" means gas from the annulus of the oil and gas well casing;

(e) "application" means the written submissions from the approval holder to the Director in respect of application number 001-255245 and any subsequent applications where amendments are issued for this approval;

(f) "central processing facility" means those buildings, structures, pollution abatement equipment, process and storage facilities and land use within the northeast quarter of Section 7, Township 091, Range 14, West of the 4th Meridian, that is being or has been used or held for or in connection with the McKay enhanced recovery in-situ oil sands or heavy oil processing plant and thermal electric (cogeneration) power plant;

(g) "commencing operations" means starting up the plant, process unit or equipment for the first time with the introduction of feed material, electrical or thermal energy and the simultaneous production of products for which the plant, process unit or equipment was designed excluding predetermined period of commissioning or testing;

(h) "day", when referring to sampling, means any sampling period of 24 consecutive hours;

(i) "decommissioning" means the dismantling and decontamination of a plant undertaken subsequent to the termination or abandonment of any activity or any part of any activity regulated under the Act;

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(j) "decontamination" means the treatment or removal of substances from the plant and affected lands;

(k) "deep organic soil" means soil with surface organic horizons that are greater than 40 cm in depth;

(l) "Director" means an employee of the Government of Alberta designated as a Director under the Act;

(m) "dismantling" means the removal of buildings, structures, process and pollution abatement equipment, vessels, storage facilities, material handling facilities, railways, roadways, pipelines and any other installations that are being or have been used or held for or in connection with the plant;

(n) "disturbed land" means the land disturbed by the approval holder in any manner in association with the activity which is the subject of the approval;

(o) "domestic wastewater" means wastewater that is the composite of liquid and water-carried wastes associated with the use of water for drinking, cooking, cleaning, washing, hygiene, sanitation or other domestic purposes, together with any infiltration and inflow wastewater, that is released into a wastewater collection system;

(p) "effluent stream" means any substance in a gaseous medium released by or from a plant;

(q) "fugitive emissions" means emissions of substances to the atmosphere other than ozone depleting substances, originating from a plant source other than a flue, vent, or stack but does not include sources which may occur due to breaks or ruptures in process equipment;

(r) "grab", when referring to a sample, means an individual sample collected in less than 30 minutes and which is representative of the substance sampled;

(s) "grade" means the rise or fall of the land surface over a specified distance, measured in the same units;

(t) "ISO/IEC 17025" means the international standard, developed and published by International Organization for Standardization (ISO), specifying management and technical requirements for laboratories;

(u) "industrial runoff" means precipitation that falls on or traverses the plant developed area;

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(v) "industrial runoff control system" means the parts of the plant that collect, store or treat industrial runoff from the plant;

(w) "industrial wastewater" means the composite of liquid wastes and water-carried wastes, any portion of which results from any industrial process carried on at the plant;

(x) "land reclamation" means the stabilization, contouring, maintenance, conditioning, reconstruction, and revegetation of the surface of the land to a state that permanently returns the plant to a land capability equivalent to its predisturbed state;

(y) "manual stack survey" means a survey conducted in accordance with the *Alberta Stack Sampling Code*, Alberta Environment, 1995, as amended;

(z) "monitoring system" means all equipment used for sampling, conditioning, analyzing or recording data in respect of any parameter listed or referred to in this approval including equipment used for continuous monitoring;

(aa) "month" means calendar month;

(bb) "net or lower heating value" means the quantity of heat evolved on complete combustion where the combustion products remain as vapour at 15°C;

(cc) "pad materials" means all geotextile and fill materials used in the construction of plant facilities;

(dd) "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 within the northeast quarter of Section 7, Township 091, Range 14, West of the 4^{th} Meridian, that is being or has been used or held for or in connection with the McKay enhanced recovery in-situ oil sands or heavy oil processing plant and thermal electric (cogeneration) power plant;

(ee) "plant developed area" means the areas of the plant used for the storage, treatment, processing, transport, or handling of raw material, intermediate product, by-product, finished product, process chemicals, or waste material;

(ff) "produced gas" means all gas associated with the production and treatment of oil or bitumen including, but not limited to, gas liberated at storage tanks, heaters, treaters, produced water facilities;

(gg) "QA/QC" means quality assurance and quality control;

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(hh) "recontoured areas" means disturbed land that has been decommissioned, contoured and decompacted;

(ii) "regulations" means the regulations enacted pursuant to the Act, as amended;

(jj) "representative grab" means a sample consisting of equal volume portions of water collected from at least four sites between 0.20-0.30 metres below the water surface within a pond;

(kk) "self-sustaining" means able to support various land uses after conservation and reclamation is complete without requiring the application of fertilizers or any other special treatment;

(ll) "shallow organic soil" means soil with surface organic horizons that are less than 40 cm in depth;

(mm) "soil" means mineral or organic earthen materials that can, have, or are being altered by weathering, biological processes, or human activity;

(nn) "subsoil" means B horizons as defined in the *Canadian System of Soil Classification*, 3rd Edition, 1998, as amended, and rated as good, fair or poor as described in the *Soil Quality Criteria Relative to Disturbance and Reclamation*, Alberta Agriculture, 1987, as amended;

(oo) "tank" means a stationary device, designed to contain an accumulation of a substance, which is constructed primarily of non-earthen materials that provide structural support including wood, concrete, steel, and plastic;

(pp) "topsoil" means the uppermost layer of soil and consists of:

(i) all organic horizons as defined in the *Canadian System of Soil Classification*, 3rd Edition, 1998, and

(ii) A horizons as defined in *Canadian System of Soil Classification,* 3rd Edition, 1998, and rated as good, fair or poor as described in the *Soil Quality Criteria Relative to Disturbance and Reclamation,* Alberta Agriculture, 1987;

(qq) "volume estimate" means a technical evaluation based on the sources contributing to the release, including but not limited to pump capabilities, water metres, and batch release volumes;

(rr) "weeds" means vegetation defined as controlled, nuisance, or noxious by the *Weed Control Act*, 1980, as amended;

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(ss) "week" means any consecutive 7-day period; and

(tt) "year" means calendar year, unless otherwise specified.

PART 2: GENERAL

SECTION 2.1: REPORTING

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 approval holder shall immediately notify the Director in writing if any of the following events occur:

(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.

2.1.4 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.

2.1.5 The approval holder shall submit all monthly reports required by this approval to be compiled or submitted to the Director on or before the end of the month following the month in which the information was collected, unless otherwise specified in this approval or authorized in writing by the Director.

2.1.6 The approval holder shall submit all annual reports required by this approval to be compiled or submitted to the Director on or before March 31 of the year following the year in which the information was collected, unless otherwise specified in this approval or authorized in writing by the Director.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

SECTION 2.2: RECORD KEEPING

2.2.1 The approval holder shall:

(a) record; and

(b) 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:

(i) the place, date and time of sampling,

(ii) the dates the analyses were performed,

(iii) the analytical techniques, methods or procedures used in the analyses,

(iv) the names of the persons who collected and analysed each sample, and

(v) 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 air:

(A) the *Alberta Stack Sampling Code*, Alberta Environment, 1995, as amended,

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(B) the *Methods Manual for Chemical Analysis of Atmospheric Pollutants*, Alberta Environment, 1993, as amended, and

(C) the *Air Monitoring Directive*, Alberta Environment, 1989, as amended;

(ii) for industrial wastewater, industrial runoff, groundwater and domestic wastewater:

(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; and

(iii) for soil:

(A) the *Soil Monitoring Directive,* Alberta Environment, 2009, as amended, and

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

2.3.2 The approval holder shall analyse 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 analysed, unless otherwise authorized in writing by the Director.

2.3.3 The term sample as used in 2.3.2 does not include samples directed to continuous monitoring equipment, until specifically required in writing by the Director.

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

SECTION 2.4: OTHER

2.4.1 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.

2.4.2 All tanks shall conform to the *Guidelines for Secondary Containment for Above Ground Storage Tanks,* Alberta Environmental Protection, 1997, as amended, unless otherwise authorized in writing by the Director.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

2.4.3 All aboveground storage tanks containing liquid hydrocarbons or organic compounds shall conform to the *Environmental Guidelines for Controlling Emissions of Volatile Organic Compounds from Aboveground Storage Tanks*, Canadian Council of Ministers of the Environment, PN 1180, 1995, as amended.

PART 3: CONSTRUCTION

SECTION 3.1: GENERAL

3.1.1 If construction of the plant as described in the application has not commenced by September 30, 2011, the approval holder shall apply for an amendment to this approval, unless otherwise authorized in writing by the Director.

3.1.2 The approval holder shall notify the Director in writing at least 14 days before commencing operations of the plant.

3.1.3 The approval holder shall construct the plant as described in the application and shall include, at a minimum, all of the following:

(a) steam generation;

(b) production (bitumen, water and gas);

(c) industrial wastewater treatment;

(d) associated facilities; and

(e) a cogeneration power plant

unless otherwise authorized in writing by the Director.

SECTION 3.2: AIR

3.2.1 The approval holder shall construct the stacks identified in 0 according to the corresponding height requirements referred to in 0, unless otherwise authorized in writing by the Director.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

~~TABLE 3.2 A~~STACK HEIGHTS

STACK	MINIMUM HEIGHT ABOVE GRADE (metres)
Two 71.2 MW steam generator exhaust stacks	30.3
Three 5 MW cogeneration unit exhaust stacks	15.2
2.9 MW utility boiler exhaust stack	10.1
2.6 MW glycol heater exhaust stack	8.5
Central processing facility flare stack	39.1
Truck-loading flare stack	12.2

3.2.2 The approval holder shall install the following minimum systems on the central processing facility flare stack:

(a) wind guard;

(b) pilot light; and

(c) electric igniter;

unless an equivalent system is authorized in writing by the Director.

3.2.3 The approval holder shall design and construct all boilers at the plant to meet the requirements prescribed in the *National Emission Guideline for Commercial/Industrial Boilers and Heaters*, CCME-PN 1286, as amended, unless otherwise authorized in writing by the Director.

3.2.4 The approval holder shall design and construct all cogeneration units at the plant to meet the requirements prescribed in the *National Emission Guidelines for Stationary Combustion Turbines*, CCME-EPC/AITG-49E, as amended, unless otherwise authorized in writing by the Director.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

MONITORING EQUIPMENT

3.2.5 Prior to commencing operations of the plant, the approval holder shall install, at a minimum, all of the following air monitoring equipment:

(a) a minimum of four passive stations for measurement of hydrogen sulphide (H_2S) and sulphur dioxide (SO_2) concentrations; and

(b) a minimum of one ambient air quality monitoring station for the measurement of hydrogen sulphide (H_2S) concentrations, sulphur dioxide (SO_2) concentrations, nitrogen dioxide (NO_2) concentrations, wind speed, and wind direction.

3.2.6 The following stacks shall be equipped with sampling facilities:

(a) the two 71.2 MW steam generator exhaust stacks;

(b) the three 5 MW cogeneration unit exhaust stacks; and

(c) the 2.9 MW utility boiler exhaust stack.

3.2.7 The sampling facilities required by 3.2.6 shall, at a minimum, be:

(a) installed;

(b) operated; and

(c) maintained;

to comply with:

(i) the *Alberta Stack Sampling Code*, Alberta Environment, 1995, as amended,

(ii) the *CEMS Code*; and

(iii) the *Air Monitoring Directive*, Alberta Environment, 1989, as amended.

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SECTION 3.3: INDUSTRIAL WASTEWATER

3.3.1 The approval holder shall construct the plant according to the application and that includes, at a minimum, all of the following unless otherwise authorized in writing by the Director:

(a) the industrial runoff control system at the central processing facility which shall include, at a minimum, an industrial runoff pond that is:

(i) sized to contain a 1-in-25 year, 24 hour precipitation event, and

(ii) lined with a 60 mil HDPE geomembrane liner;

(b) incorporation into the design of the plant, equipment, and operational procedures for the minimization and recovery of spills of process wastewater and process liquids;

(c) above ground storage tanks in accordance with *Alberta Energy Resources Conservation Board (ERCB) Directive 055 Storage Requirements for the Upstream Petroleum Industry*, 2001, as amended;

(d) spill collection boxes at the hose connection point of any new liquid load-out or off-loading areas; and

(e) spill collection boxes shall have a cover and shall be positioned such that each of its sides and bottom can be visually inspected.

SECTION 3.4: WASTE MANAGEMENT

Not used at this time.

SECTION 3.5: DOMESTIC WASTEWATER

3.5.1 The approval holder shall construct a domestic wastewater treatment system that:

(a) releases treated domestic wastewater to an area beyond the plant boundary, or

(b) treats 25 cubic meters, or more, of domestic wastewater per day in a domestic wastewater treatment plant

only if authorized by an amendment to this approval.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

SECTION 3.6: LAND CONSERVATION

3.6.1 The approval holder shall salvage merchantable timber as directed in writing by an Inspector.

3.6.2 The approval holder shall dispose of woody debris as directed in writing by an Inspector.

3.6.3 The approval holder shall:

(a) salvage; and

(b) conserve

topsoil for land reclamation as follows:

(i) salvage all topsoil on mineral and shallow organic soil areas,

(ii) on areas of deep organic soil where pad materials will be left in place during land reclamation:

(A) salvage topsoil to a minimum depth of 40 cm, or

(B) provide to the Director for written authorization, an alternative plan for obtaining topsoil materials for land reclamation;

(iii) no topsoil salvage on areas of deep organic soil where pad materials will be removed during land reclamation; and

(iv) salvage all of the replaced topsoil layer in a reconstructed soil profile

unless otherwise authorized in writing by the Director.

3.6.4 The approval holder shall:

(a) salvage; and

(b) conserve

all subsoil from the central processing facility for land reclamation as follows:

(i) separately from topsoil, and

(ii) to a maximum thickness of 30 cm

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unless otherwise authorized in writing by the Director.

3.6.5 The approval holder shall:

(a) conserve; and

(b) stockpile

all topsoil and subsoil separately from:

(i) each other; and

(ii) other materials.

3.6.6 The approval holder shall stockpile topsoil as follows:

(a) on undisturbed topsoil;

(b) on stable foundations;

(c) shall be accessible and retrievable;

(d) shall be identified with a permanent signpost; and

(e) shall be controlled for weeds

unless otherwise authorized in writing by the Director.

3.6.7 The approval holder shall stockpile subsoil as follows:

(a) on areas where the topsoil has been removed;

(b) on stable foundations;

(c) shall be accessible and retrievable;

(d) shall be identified with a permanent signpost; and

(e) shall be controlled for weeds

unless otherwise authorized in writing by the Director.

3.6.8 The approval holder shall take all steps necessary to prevent water and wind erosion of all stockpiles, including but not limited to, all of the following:

(a) revegetating the stockpiles; and

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(b) any other steps authorized in writing by an Inspector.

3.6.9 The approval holder shall immediately suspend conservation of:

(a) topsoil; and

(b) subsoil

if directed to do so in writing by an Inspector, or when

(i) wet conditions,

(ii) frozen conditions,

(iii) high wind velocities, or

(iv) any other field condition or operation

will result in mixing, loss or degradation of topsoil or subsoil.

3.6.10 The approval holder shall recommence conservation of:

(a) topsoil; and

(b) subsoil

only when the field conditions in 3.6.9 no longer exist or if directed to do so in writing by an Inspector.

3.6.11 The approval holder shall implement drainage control measures to minimize erosion and sedimentation on disturbed land and adjacent land.

3.6.12 The approval holder shall submit a Disturbance and Stockpile Summary Report to the Director within six months of the plant commencing operations, unless otherwise authorized in writing by the Director.

3.6.13 The Disturbance and Stockpile Summary Report shall include, at a minimum, all of the following:

(a) a summary of the location, dimensions, and area of the final disturbance footprint (ha);

(b) final locations and dimensions of topsoil and subsoil stockpiles, including survey drawings;

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(c) a description of the source and characteristics of the materials included in the topsoil and subsoil stockpiles;

(d) location and volume of topsoil and subsoil used for interim reclamation or in direct placement for final land reclamation;

(e) final volumes of topsoil and subsoil stockpiles; and

(f) any other information as required in writing by the Director.

SECTION 3.7: WILDLIFE

3.7.1 The approval holder shall submit a Wildlife Mitigation Plan that includes the local study area, to the Director by December 31, 2011, unless otherwise authorized in writing by the Director.

3.7.2 The focus of the Wildlife Mitigation Plan required in 3.7.1 shall include, but not be limited to:

(a) detailed methods for mitigating the effects of the project on wildlife throughout the life of the project;

(b) description of potential barriers to movement and use (e.g. height, width, length, and orientation of above ground pipes and roads);

(c) mitigation strategies and design features to facilitate wildlife movement and habitat use through the project area considering the following:

(i) line of sight issues,

(ii) adequacy of vegetation cover (i.e. type and extent),

(iii) relationship of infrastructure to natural movement corridors (i.e. riparian areas), and temporal and spatial migration patterns of wildlife, and

(iv) physical and behavioural characteristics of wildlife; and

(d) mitigation for species at risk including those identified as – “at risk” and “may be at risk”, and “sensitive” species listed in *The General Status of Alberta Wild Species*, 2005.

3.7.3 If the Wildlife Mitigation Plan is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director, by the date specified in writing by the Director.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

3.7.4 The approval holder shall implement the Wildlife Mitigation Plan submitted pursuant to 3.7.1 as authorized in writing by the Director.

PART 4: OPERATIONS, LIMITS, MONITORING AND REPORTING

SECTION 4.1: AIR

OPERATIONS

4.1.1 The approval holder shall not release any air effluent streams to the atmosphere except as authorized by this approval.

4.1.2 The approval holder shall only release air effluent streams to the atmosphere from the following sources:

(a) the two 71.2 MW steam generator exhaust stacks;

(b) the three 5 MW cogeneration unit exhaust stacks;

(c) the 2.9 MW utility boiler exhaust stack;

(d) the 2.6 MW glycol heater exhaust stack;

(e) the central processing facility flare stack;

(f) the truck-loading flare stack; and

(g) any other source authorized in writing by the Director.

4.1.3 The approval holder shall operate and maintain the following stacks according to the minimum height requirements specified in TABLE 4.1-A, unless otherwise authorized in writing by the Director.

TABLE 4.1-A STACK HEIGHTS

STACK	MINIMUM HEIGHT ABOVE GRADE (metres)
Two 71.2 MW steam generator exhaust stacks	30.3
Three 5 MW cogeneration unit exhaust stacks	15.2
2.9 MW utility boiler exhaust stack	10.1
2.6 MW glycol heater exhaust stack	8.5
Central processing facility flare stack	39.1
Truck-loading flare stack	12.2

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4.1.4 The approval holder shall continuously operate the central processing facility flare stack with the following minimum systems:

(a) wind guard;

(b) pilot light; and

(c) electric igniter;

unless an equivalent system is authorized in writing by the Director.

4.1.5 The approval holder shall not burn any debris by means of an open fire, unless otherwise authorized in writing by the Director.

4.1.6 Annulus gas and produced gas shall be collected and only be burned as fuel, incinerated, or flared.

4.1.7 The approval holder shall ensure the combustion of all combustible gases released to the flare stacks.

4.1.8 The approval holder shall ensure that all central processing facility pressure and safety valves in sour service shall be connected to the flare system.

4.1.9 The approval holder shall control fugitive emissions and any source not specified in 4.1.2 in accordance with 4.1.10 of this approval, unless otherwise authorized in writing by the Director.

4.1.10 With respect to fugitive emissions and any source not specified in 4.1.2, the approval holder shall not release a substance or cause to be released a substance that causes or may cause any of the following:

(a) impairment, degradation or alteration of the quality of natural resources;

(b) material discomfort, harm or adverse effect to the well being or health of a person; or

(c) harm to property or to the plant or animal life.

4.1.11 The approval holder shall submit a Fugitive Emissions Leak Detection and Correction Program to the Director by November 30, 2012, unless otherwise authorized in writing by the Director.

4.1.12 The Fugitive Emissions Leak Detection and Correction Program shall include the periodic inspection and repair of any equipment found to be leaking.

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4.1.13 If the Fugitive Emissions Leak Detection and Correction Program is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director, by the date specified in writing by the Director.

4.1.14 The approval holder shall implement the Fugitive Emissions Leak Detection and Correction Program as authorized in writing by the Director.

AIR LIMITS

4.1.15 Releases of the following substances to the atmosphere shall not exceed the limits specified in TABLE 4.1-B.

TABLE 4.1-B AIR LIMITS

EMISSION SOURCE	SUBSTANCE	LIMIT (Maximum)
Plant	Sulphur Dioxide	0.50 tonnes per day
Each of the two 71.2 MW steam generator exhaust stacks	Oxides of Nitrogen (expressed as NO_2)	10.3 kilograms per hour
Each of the three 5 MW cogeneration unit exhaust stacks	Oxides of Nitrogen (expressed as NO_2)	3.0 kilograms per hour
2.9 MW utility boiler exhaust stack	Oxides of Nitrogen (expressed as NO_2)	0.3 kilograms per hour

4.1.16 The net or lower heating value of the combined gas stream released to the central processing facility flare stack shall be maintained, at a minimum, at 20 MJ/m^3 when adjusted for 101.325 kPa and 15°C by adding residue gas to the flare gas.

4.1.17 The approval holder shall operate no more than two cogeneration units at any one time, excepting a maximum of 1 hour total duration in each month.

4.1.18 The approval holder shall comply with the *Emission Guidelines for Oxides of Nitrogen (NO_x) for New Boilers, Heaters and Turbines using Gaseous Fuels based on a Review of BATEA* (Alberta Environment, 2007), as amended.

MONITORING AND REPORTING

4.1.19 The approval holder shall monitor the air emission sources as specified in TABLE 4.1-C, unless otherwise authorized in writing by the Director.

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4.1.20 The approval holder shall report to the Director the results of the air emission source monitoring as required in TABLE 4.1-C, unless otherwise authorized in writing by the Director.

TABLE 4.1-C AIR SOURCE MONITORING AND REPORTING

EMISSION SOURCE	MONITORING			REPORTING FREQUENCY	
	PARAMETER	METHOD OF MONITORING	FREQUENCY	MONTHLY	ANNUALLY
Produced gas and residue or fuel gas to the central processing facility flare stack	Volumetric flow rates	Measured or Estimated	Continuously	Yes	No
Produced gas at the central processing facility	Hydrogen sulphide	Gas analysis	Monthly	Yes	No
	Total Hydrocarbons				
	Lower heating value				
Central processing facility flare stack and the two 71.2 MW steam generator exhaust stacks	Sulphur dioxide	Calculated	Daily	Yes (tonnes per day)	Yes (tonnes per year)
Each of the two 71.2 MW steam generator exhaust stacks	Oxides of nitrogen (expressed as NO_2)	Manual stack survey	Once within six months of commissioning	Yes	Yes (summary only)
Each of the two 71.2 MW steam generator exhaust stacks	Oxides of nitrogen (expressed as NO_2)	Manual stack survey	Once per year after initial commissioning manual stack survey	Yes	Yes (summary only)
Each of the 5 MW cogeneration unit exhaust stacks	Oxides of nitrogen (expressed as NO_2)	Manual stack survey	Once within six months of commissioning	Yes	Yes (summary only)
	Carbon Monoxide				
	Oxides of nitrogen (expressed as NO_2)	Manual stack survey	Once per year after initial commissioning manual stack survey	Yes	Yes (summary only)
	Carbon Monoxide				
2.6 MW utility boiler exhaust stack	Oxides of nitrogen (expressed as NO_2)	Manual stack survey	Once within six months of commissioning	Yes	Yes (summary only)

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4.1.21 The approval holder shall notify the Director in writing a minimum of two weeks prior to any manual stack survey that is required to be conducted by this approval.

4.1.22 The monitoring required by 4.1.19, shall at a minimum, comply with:

(a) the *Alberta Stack Sampling Code*, Alberta Environment, 1995, as amended;

(b) the CEMS Code; and

(c) the *Air Monitoring Directive*, Alberta Environment, 1989, as amended.

4.1.23 The approval holder shall monitor ambient air parameters as specified in TABLE 4.1-D, unless otherwise authorized in writing by the Director.

4.1.24 The approval holder shall report to the Director the results of the ambient air monitoring as required in TABLE 4.1-D, unless otherwise authorized in writing by the Director.

TABLE 4.1-D AMBIENT AIR MONITORING AND REPORTING

MONITORING STATION	PARAMETER TO BE ANALYSED OR MEASURED	FREQUENCY	METHOD OF MONITORING	METHOD OF ANALYSIS OR MEASUREMENT	REPORT FREQUENCY (one copy required)	
					Monthly	Annually
1 continuous monitoring station	Sulphur dioxide	Continuously, for a minimum of 3 months of each year	Continuous sampling	Air Monitoring Directive	Yes	Yes
	Hydrogen sulphide					
	Nitrogen dioxide					
	Wind speed and wind direction					
4 passive monitoring stations	Sulphur dioxide	Monthly	Passive Sampling	As per manufacturer's specifications unless otherwise required in the Air Monitoring Directive, as amended	Yes	Yes
	Hydrogen sulphide					

TERMS AND CONDITIONS ATTACHED TO APPROVAL

4.1.25 In addition to the monthly monitoring requirements in TABLE 4.1-C and TABLE 4.1-D, the monthly Air Emission Summary Report shall contain remarks on the performance of the air pollution control equipment including an interpretation of significant variations in equipment performance.

4.1.26 In addition to the annual reporting requirement in TABLE 4.1-C and TABLE 4.1-D, the annual Air Emission Summary and Evaluation Report shall contain:

(a) information related to the plant operation;

(b) the performance of air pollution control equipment;

(c) air contaminant emissions;

(d) the total duration, in each month, the three cogeneration units operated at the same time; and

(e) any other information requested in writing by the Director.

SECTION 4.2: INDUSTRIAL WASTEWATER

OPERATIONS

4.2.1 The approval holder shall not release any substances from the plant to the surrounding watershed except as authorized by this approval.

4.2.2 The approval holder shall manage:

(a) industrial wastewater; and

(b) industrial runoff;

as described in the application, unless otherwise authorized in writing by the Director.

4.2.3 All industrial wastewater and process liquids contained in above ground and below ground storage tanks, shall be contained in accordance with the Alberta Energy Resources Conservation Board (ERCB) Directive 055 *Storage Requirements for the Upstream Petroleum Industry*, as amended.

4.2.4 The approval holder shall only dispose of industrial wastewater as follows:

(a) to an Alberta Energy Resources Conservation Board approved disposal well;

(b) to an Alberta Energy Resources Conservation Board approved Waste Processing and Disposal Facility; or

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(c) as otherwise authorized in writing by the Director.

4.2.5 The approval holder shall direct all industrial runoff from the plant developed area to the Industrial Runoff Control System, specifically to the industrial runoff pond.

4.2.6 Subject to 4.2.7, the approval holder shall only release industrial runoff from the Industrial Runoff Control System to the surrounding watershed unless otherwise authorized in writing by the Director.

LIMITS

4.2.7 Releases from the Industrial Runoff Control System shall meet the limits for the parameters specified in TABLE 4.2-A.

TABLE 4.2-A INDUSTRIAL RUNOFF CONTROL SYSTEM LIMITS

PARAMETER	PARAMETER OR CONCENTRATION LIMITS
Discharge volume	--
pH	$\geq$ 6.0 and $\leq$ 9.5 pH units
Oil and grease	No visible sheen
Chloride	$\leq$ 500 mg/L

4.2.8 The approval holder shall only release industrial runoff in a manner that will not cause flooding or erosion.

MONITORING AND REPORTING

4.2.9 The approval holder shall monitor the Industrial Runoff Control System as required in TABLE 4.2-B, unless otherwise authorized in writing by the Director.

4.2.10 The approval holder shall report to the Director the results of the Industrial Runoff Control System monitoring as required in TABLE 4.2-B, unless otherwise authorized in writing by the Director.

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TABLE 4.2-B INDUSTRIAL RUNOFF CONTROL SYSTEM MONITORING AND REPORTING

MONITORING						REPORTING
PARAMETER	PRIOR TO RELEASE		THROUGHOUT THE RELEASE PERIOD			ANNUALLY
	FREQUENCY	SAMPLE TYPE	FREQUENCY	SAMPLE TYPE	SAMPLE LOCATION	
Discharge volume (m^3)	-	-	Once/day	Volume estimate	A	Yes
pH	Once	Representative grab	Once/day	Grab	A	
Oil and grease	Once	Representative grab	Once/day	Grab	A	
Chloride (mg/L)	Once	Representative grab	Once/day	Grab	A	
A = Discharge point of industrial runoff control system (industrial runoff pond)						

4.2.11 The approval holder shall submit an annual Industrial Wastewater and Industrial Runoff Report to the Director.

4.2.12 The annual Industrial Wastewater and Industrial Runoff Report shall include, at a minimum, all of the following information:

(a) an assessment of the performance of the Industrial Runoff Control System;

(b) an overview of the operation of the plant;

(c) a summary and evaluation of management and disposal of:

(i) the industrial wastewater, and

(ii) the industrial runoff; and

(d) any other information as required in writing by the Director.

SECTION 4.3: WASTE MANAGEMENT

Not used at this time.

SECTION 4.4: DOMESTIC WASTEWATER

Not used at this time.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

SECTION 4.5: GROUNDWATER

4.5.1 The approval holder shall develop a proposal for a Groundwater Monitoring Program for the plant which shall include, at a minimum, all of the following:

(a) a hydrogeologic description and interpretation of the plant;

(b) a map and description of surface water drainage patterns for the plant;

(c) a lithologic description and maps, including cross-sections, of the surficial and the upper bedrock geologic materials at the plant;

(d) a site map showing the location and type of current and historical potential sources of groundwater contamination;

(e) a cross-section(s) showing depth to water table, patterns of groundwater movement and hydraulic gradients at the plant;

(f) the hydraulic conductivity of all surficial and bedrock materials at the plant;

(g) a map showing the location of existing and additional proposed groundwater monitoring wells at the plant;

(h) a lithologic description of all boreholes drilled at the plant;

(i) construction and completion details of existing groundwater monitoring wells;

(j) a rationale for proposed groundwater monitoring well locations and proposed completion depths of those wells;

(k) a description of groundwater monitoring well development protocols;

(l) a list of parameters to be monitored and the monitoring frequency for each groundwater monitoring well or group of groundwater monitoring wells at the plant;

(m) a description of the groundwater sampling and analytical QA/QC procedures;

(n) details of a groundwater response plan specifying actions to be taken should contaminants be identified through the Groundwater Monitoring Program; and

(o) any other information relevant to groundwater quality at the plant.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

4.5.2 The Groundwater Monitoring Program referred to in 4.5.1 shall include monitoring of all major non-saline aquifers penetrated by well bores associated with steam injection and production of heated bitumen, unless otherwise authorized in writing by the Director.

4.5.3 The approval holder shall submit the proposal for the Groundwater Monitoring Program to the Director on or before March 31st, 2011.

4.5.4 If the Groundwater Monitoring Program proposal is found deficient by the Director, the approval holder shall correct all deficiencies as outlined in writing by the Director, within the timeline specified in writing by the Director.

4.5.5 The approval holder shall implement the Groundwater Monitoring Proposal as authorized in writing by the Director.

4.5.6 The approval holder shall conduct at least five groundwater sampling events to establish baseline conditions prior to commencement of operations for:

(a) the central processing facility;

(b) expansion areas which were not covered in prior sampling events; and

(c) previously non-assessed hydrostratigraphic units at existing facilities;

unless otherwise authorized in writing by the Director.

4.5.7 The sampling events referred to in 4.5.6 shall be at intervals of no less than one month and must demonstrate stable groundwater conditions.

4.5.8 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.

4.5.9 If a representative groundwater sample cannot be collected because the groundwater monitoring 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

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(b) collect and analyse a representative groundwater sample prior to the next scheduled sampling event

unless otherwise authorized in writing by the Director.

4.5.10 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, and depth below ground surface of fluid phases in the groundwater monitoring 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.

4.5.11 The approval holder shall carry out remediation of the groundwater in accordance with the following:

(a) *Alberta Tier 1 Soil and Groundwater Remediation Guidelines*, Alberta Environment, February 2009, as amended; and

(b) *Alberta Tier 2 Soil and Groundwater Remediation Guidelines*, Alberta Environment, February 2009, as amended.

4.5.12 The approval holder shall compile a Groundwater Monitoring Report which shall include, at a minimum, all of the following information:

(a) a completed *Record of Site Condition Form*, Alberta Environment, 2009, as amended;

(b) a legal land description of the plant and a map illustrating the plant boundaries;

(c) a topographic map of the plant;

(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 least a five kilometre radius of the plant;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(f) a general hydrogeological characterization of the region within a five kilometre radius of the plant;

(g) a detailed hydrogeological characterization of the plant, including an interpretation of groundwater flow patterns;

(h) cross-sections showing depth to water table, patterns of groundwater movement and hydraulic gradients at the plant;

(i) borehole logs and completion details for groundwater monitoring wells;

(j) a map showing locations of all known buried channels within at least five kilometre of the plant;

(k) a map of surface drainage within the plant and surrounding area to include nearby water bodies;

(l) a map of groundwater monitoring well locations and a table summarizing the existing groundwater monitoring program for the plant;

(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 4.5.2 and 4.5.9(b);

(o) a summary of fluid elevations recorded as required in 4.5.10(b) and an interpretation of changes in fluid elevations;

(p) an interpretation of QA/QC program results;

(q) an interpretation of all 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; and

(v) recommendations for changes to the groundwater monitoring program to make it more effective.

4.5.13 The approval holder shall submit the Groundwater Monitoring Report to the Director on or before March 31st of every year commencing in the year 2012 unless otherwise authorized in writing by the Director.

4.5.14 If the Groundwater Monitoring 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.

SECTION 4.6: SOIL

4.6.1 In addition to any other requirements specified in this approval, the approval holder shall conduct all of the following activities related to soil monitoring and soil management required by this approval in accordance with the *Soil Monitoring Directive,* Alberta Environment, 2009, as amended:

(a) designing and developing proposals for the Soil Monitoring Program;

(b) designing and developing proposals for the Soil Management Program;

(c) all other actions, including sampling, analysing, and reporting, associated with the Soil Monitoring Program; and

(d) all other actions, including sampling, analysing and reporting, associated with the Soil Management Program.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

MONITORING AND REPORTING

4.6.2 The approval holder shall submit the Soil Monitoring Program proposal to the Director according to the following schedule:

(a) for the first soil monitoring event on or before January 31, 2013; and

(b) for the second soil monitoring event on or before January 31, 2018;

unless otherwise authorized in writing by the Director.

4.6.3 If any Soil Monitoring Program proposal is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director, by the date specified in writing by the Director.

4.6.4 The approval holder shall implement the Soil Monitoring Program as authorized in writing by the Director.

4.6.5 If an authorization or a deficiency letter is not issued within 120 days of the applicable date required by 4.6.2, the approval holder shall implement the Soil Monitoring Program:

(a) in accordance with the program as set out in the proposal submitted by the approval holder; and

(b) within 270 days after the applicable date required by 4.6.2.

4.6.6 The approval holder shall submit to the Director each Soil Monitoring Program Report obtained from the soil monitoring referred to in 4.6.4 and 4.6.5 according to the following schedule:

(a) for the first Soil Monitoring Report on or before January 31, 2014; and

(b) for the second Soil Monitoring Report on or before January 31, 2019;

unless otherwise authorized in writing by the Director.

4.6.7 If any Soil Monitoring Program Report is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director, by the date specified in writing by the Director.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

SOIL MANAGEMENT PROGRAM

4.6.8 If the Soil Monitoring Program, or any other soil monitoring, reveals that there are substances present in the soil at concentrations greater than any of the applicable concentrations set out in the standards in the *Soil Monitoring Directive*, Alberta Environment, 2009, as amended, the approval holder shall develop a Soil Management Program Proposal.

4.6.9 If a Soil Management Program Proposal is required pursuant to 4.6.8, the approval holder shall submit a Soil Management Program Proposal to the Director according to the following schedule:

(a) for Soil Management Proposal that is triggered by the findings from the first soil monitoring event on or before the date in 4.6.6(a);

(b) for Soil Management Proposal that is triggered by the findings from a second soil monitoring event on or before the date in 4.6.6(b); or

(c) for any other soil monitoring event not specified in this approval within six months of completion of the soil monitoring event.

4.6.10 If any Soil Management Program Proposal is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director, by the date specified in writing by the Director.

4.6.11 The approval holder shall implement the Soil Management Program as authorized in writing by the Director.

4.6.12 If the approval holder is required to implement a Soil Management Program pursuant to 4.6.11, the approval holder shall submit an annual Soil Management Program Report to the Director, unless otherwise authorized in writing by the Director.

4.5.15 If the annual Soil Management Program Report is found deficient by the Director, the approval holder shall correct all deficiencies identified by the Director, by the date specified in writing by the Director.

SECTION 4.7: WILDLIFE

4.7.1 The approval holder shall participate in the Alberta Biodiversity Monitoring Institute in a manner satisfactory to the Director.

4.7.2 The approval holder shall apply the Best Management Practices for Camps, Fences and Barriers as described in *BearSmart: Management Practices for Camps*, Alberta Sustainable Resource Development, 2004, as amended, and shall store garbage in secure bear proof containers.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

4.7.3 The approval holder shall submit a Wildlife Monitoring Program to the Director by April 30, 2011 unless otherwise authorized in writing by the Director.

4.7.4 In cooperation with the Local SRD Biologist and the Alberta Caribou Committee, the proponent shall monitor the abundance, distribution and movements of woodland caribou to measure the long-term effects of the project on caribou.

4.7.5 The Wildlife Monitoring Program required in 4.7.3 shall include, at a minimum, the following:

(a) a long term plan to

(i) monitor wildlife movement and the responses of wildlife to above-ground pipelines and other linear features, and

(ii) analyze the effectiveness of mitigation;

(b) a plan to identify existing wildlife habitat connectivity, including:

(i) an assessment of the function of any potential or existing habitat connectivity corridors including barriers to use,

(ii) a discussion about potential mitigation options, and

(iii) the approval holder's commitment to participate, with other operators, in regional initiatives, that facilitate the integration, maintenance and monitoring of connectivity in the region;

(c) a description of methodology and frequency for monitoring other wildlife species of concern – "at risk", "may be at risk", and "sensitive" species listed in *The General Status of Alberta Wild Species*, 2005; and

(d) a discussion of corrective measures that could be implemented to protect affected species of concern, in the event that impacts are in excess of those predicted for the project.

4.7.7 If the Wildlife Monitoring Program Proposal is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director, by the date specified in writing by the Director.

4.7.8 The approval holder shall implement the Wildlife Monitoring Program as authorized in writing by the Director.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

4.7.9 The approval holder shall submit a comprehensive report on the Wildlife Program to the Director every 3 years, including a description of the methods and results of monitoring and any proposed changes to the monitoring or mitigation programs.

PART 5: DECOMMISSIONING AND LAND RECLAMATION

SECTION 5.1: GENERAL

5.1.1 The approval holder shall apply for an amendment to this approval to reclaim the plant by submitting a:

(a) Decommissioning Plan; and

(b) Land Reclamation Plan

to the Director.

5.1.2 The approval holder shall submit the:

(a) Decommissioning Plan; and

(b) Land Reclamation Plan

referred to in 5.1.1 within six months of the plant ceasing operation, except for repairs and maintenance, unless otherwise authorized in writing by the Director.

DECOMMISSIONING PLAN

5.1.3 The Decommissioning Plan referred to in 5.1.1 shall include, at a minimum, all of the following:

(a) a plan for dismantling the plant;

(b) a comprehensive study to determine the nature, degree and extent of contamination at the plant and affected lands;

(c) a plan to manage all wastes at the plant;

(d) evaluation of remediation technologies proposed to be used at the plant and affected lands;

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(e) a plan for decontamination of the plant and affected lands in accordance with the following:

(i) for soil or groundwater, *Alberta Tier 1 Soil and Groundwater Remediation Guidelines*, Alberta Environment, February 2009, as amended,

(ii) for soil or groundwater, *Alberta Tier 2 Soil and Groundwater Remediation Guidelines*, Alberta Environment, February 2009, as amended,

(iii) for drinking water, *Canadian Environmental Quality Guidelines*, Canadian Council of Ministers of the Environment, PN 1299, 1999, as amended, and

(iv) for surface water, *Surface Water Quality Guidelines for Use in Alberta*, Alberta Environment, November 1999, as amended;

(f) confirmatory testing to indicate compliance with the remediation objectives;

(g) a plan for maintaining and operating contaminant monitoring systems;

(h) a schedule for activities (a) through (g) above; and

(i) any other information as required in writing by the Director.

5.1.4 If the Decommissioning Plan is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director, by the date specified in writing by the Director.

LAND RECLAMATION PLAN

5.1.5 The Land Reclamation Plan referred to in 5.1.1 shall include, at a minimum, all of the following:

(a) the final use of the reclaimed area and how equivalent land capability will be achieved;

(b) removal of infrastructure, including watercourse crossings;

(c) a plan for the reclamation of all roads including removal of culverts and other structures;

(d) restoration of drainage and how it will be integrated with adjacent land;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(e) description of reclaimed topography and how the reclaimed landforms will approximate the natural landforms adjacent to the plant;

(f) soil replacement, including:

(i) depths, and

(ii) volumes;

(g) erosion control;

(h) revegetation and conditioning of the plant including:

(i) species list, seed source and quality, seeding rates and methods,

(ii) information about areas where reforestation will occur,

(iii) justification for areas where reforestation is not proposed,

(iv) fertilization rates and methods,

(v) a vegetation management plan, and

(vi) wildlife habitat plans where applicable;

(i) reclamation sequence and schedule;

(j) a comprehensive Reclamation and Monitoring Program to assess soils, vegetation and wildlife on reclaimed areas; and

(k) any other information as required by the Director.

5.1.6 If the Land Reclamation Plan is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director, by the date specified in writing by the Director.

SECTION 5.2: LAND RECLAMATION

5.2.1 The approval holder shall ensure that reclaimed slopes shall be no steeper than 3:1.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

5.2.2 The approval holder shall cap any unsuitable material, as described in the *Soil Quality Criteria Relative to Disturbance and Reclamation*, Alberta Agriculture, 1987, as amended, where unsuitability is not related to contamination, with 1.0 metre of soil material having a good, fair or poor rating, as described in the *Soil Quality Criteria Relative to Disturbance and Reclamation*, Alberta Agriculture, 1987, as amended, prior to subsoil and topsoil replacement.

5.2.3 The approval holder shall replace all salvaged subsoil on recontoured areas of the plant.

5.2.4 The approval holder shall replace all salvaged topsoil on all recontoured areas such that the average depth of topsoil in the reclaimed profile for each reclamation area is equivalent to or greater than 80% of the original topsoil depth, unless otherwise authorized in writing by the Director.

5.2.5 The approval holder shall immediately suspend replacement of:

(a) topsoil; and

(b) subsoil

if directed to do so in writing by an Inspector, or when

(i) wet conditions,

(ii) frozen conditions,

(iii) high wind velocities, or

(iv) any other field condition or operation

will result in mixing, loss or degradation of topsoil or subsoil.

5.2.6 The approval holder shall recommence replacement of:

(a) topsoil; and

(b) subsoil

only when the field conditions in 5.2.5 no longer exist or if directed to do so in writing by an Inspector.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

5.2.7 The approval holder shall maintain a weed control program until new vegetation is established and is self-sustaining.

DATED November 19, 2010

DESIGNATED DIRECTOR UNDER THE ACT

Government of Alberta ■
Environment

APPROVAL

PROVINCE OF ALBERTA

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

APPROVAL NO. 287052-00-00

APPLICATION NO. 001-287052

EFFECTIVE DATE: May 25, 2011

EXPIRY DATE: May 1, 2021

APPROVAL HOLDER: Southern Pacific Resource Corp.

ACTIVITY: Construction, operation and reclamation of a wastewater system for the Southern Pacific McKay SAGD Work Camp in SW-7-91-14-W4

is subject to the attached terms and conditions.

Designated Director under the Act .....

Date Signed May 25, 2011

Alberta■

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 001-287052 and any subsequent applications for amendments of approval number 287052-00-00;

(c) "arithmetic mean" means the sum of all the sample analysis results divided by the total number of samples per reporting period;

(d) "BOD_5" means the Biochemical Oxygen Demand in milligrams per litre measured at 20°C over a 5 day period;

(e) "$CBOD_5$" means the carbonaceous BOD_5 in milligrams per litre which is measured after the nitrogenous demand has been inhibited with an inhibitory chemical;

(f) "chemical" means any substance that is added or used as part of the treatment process;

(g) "composite sample" means:

(i) a composite of samples of the stream collected over a 24 hour period, which is representative of the stream sampled, collected every 15 minutes in a quantity proportional to the flow rate of the stream,

OR

(ii) a refrigerated (approximately 4°C) sample consisting of not less than twelve portions of equal volume which are representative of the stream sampled, collected over a 24 hour period, at a rate proportional to the flow rate of the stream sampled,

OR

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(iii) a refrigerated (approximately 4°C) sample consisting of not less than twenty-four portions of equal volume which are representative of the stream sampled, collected at time intervals proportional to the flow rate of the stream sampled during each time interval, with a minimum of one sample collected every hour over a 24 hour period,

OR

(iv) a refrigerated (approximately 4°C) sample consisting of not less than twenty-four portions of equal volume collected sequentially at regular time intervals over a 24 hour period;

(h) "continuous monitoring" means sampling or flow measurement through equipment that creates an uninterrupted output of the analysis or flow measurement;

(i) "day" means any sampling period of 24 consecutive hours;

(j) "Director" means an employee of the Government of Alberta designated as a Director under the Act;

(k) "grab sample" means an individual sample collected in less than 30 minutes and which is representative of the substance sampled;

(l) "regulations" means the regulations issued pursuant to the Act and as amended;

(m) "TSS" means the total suspended solids or non-filterable residue (NFR) measured in milligrams per litre;

(n) "wastewater treatment plant" means the physical components of the wastewater system that are used to treat wastewater including components associated with the management of any wastes generated during treatment and includes the land located within SW ¼ Section 07, Township 91, Range 14, West of the 4th Meridian, that is being or has been used or held for or in connection with the work camp wastewater treatment plant;

(o) "week" means any consecutive 7-day period; and

(p) "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 by telephone any contravention of the terms and conditions of this approval to the Director at 1-780-422-4505.

2.1.2 In addition to reporting pursuant to 2.1.1, the approval holder shall submit, within **seven** (7) days of any contravention of the terms and conditions of this approval, a written report to the Director.

2.1.3 Any conflict between the approval application and the terms and conditions of this approval shall be resolved in favour of this approval.

2.1.4 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.

2.1.5 The terms and conditions of this approval do not affect any rights or obligations created under any other authorization issued by Alberta Environment.

2.1.6 All abbreviations used in this approval follow those given in *Standard Methods for the Examination of Water and Wastewater*, published jointly by the American Public Health Association, the American Water Works Association, and the Water Environment Federation, as amended, unless otherwise specified in this approval.

2.1.7 The approval holder shall submit an application for renewal to the Director a minimum of **six** (6) months prior to the approval expiry date, or as otherwise specified in writing by the Director.

2.1.8 The approval holder shall notify the Director in writing within **thirty** (30) days of all changes in the corporate status of the approval holder.

2.1.9 The approval holder shall comply with all of the terms and conditions of any written authorization or request issued by the Director.

SECTION 2.2: RECORD KEEPING

2.2.1 The approval holder shall retain copies of all of the following records for the life of the wastewater system:

(a) applications submitted to Alberta Environment for approval regarding the wastewater system;

(b) approvals issued under the Act for the wastewater system;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(c) correspondence related to the approvals;

(d) engineering drawings and specifications;

(e) construction documents;

(f) as-built drawings;

(g) reports of inspections conducted by Alberta Environment;

(h) correspondence and written notifications sent to Alberta Environment regarding proposed extensions and/or replacements of a portion of the wastewater collection system;

(i) correspondence and written notifications sent to Alberta Environment regarding expansion and/or modification of the wastewater treatment plant; and

(j) reports prepared pursuant to Subsections 6.2.2 and 6.2.3.

2.2.2 The approval holder shall record and retain all of the following information in respect to any sampling conducted or analyses performed for a minimum of **three** (3) years from the date the record was created:

(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.

2.2.3 The approval holder shall immediately provide any records, reports or data required under this approval to the Director or an inspector, upon request.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

SECTION 2.3: ANALYTICAL REQUIREMENTS

2.3.1 Collection, preservation, storage, handling and analysis of samples, and reporting shall be conducted in accordance with the following unless otherwise specified in writing by the Director:

(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, as amended; and/or

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

2.3.2 The approval holder shall ensure that all analytical data for the parameters to be monitored in this approval are produced by laboratories accredited for those parameters by the Standards Council of Canada or organizations designated by the Standards Council of Canada to provide such accreditation, unless prior written authorization for exemption from such accreditation is provided by the Director.

2.3.3 The approval holder shall ensure that the monitoring equipment used is calibrated in accordance with the equipment or sampling kit manual specifications.

PART 3: CONSTRUCTION AND UPGRADING REQUIREMENTS

SECTION 3.1: CONSTRUCTION

3.1.1 The approval holder shall construct the wastewater treatment plant according to the application submitted to the Director on January 28, 2011

3.1.2 The approval holder shall obtain a written authorization or an amendment to this approval from the Director prior to the commencement of the construction for any of the following:

(a) extension to the wastewater collection system; and

(b) changes to the wastewater treatment system other than those identified in this approval.

SECTION 3.2: UPGRADING

Not used at this time

TERMS AND CONDITIONS ATTACHED TO APPROVAL

PART 4: OPERATIONS

SECTION 4.1: WASTEWATER COLLECTION AND TREATMENT

4.1.1 The approval holder shall not release any substances from the wastewater system to the surrounding watershed except as authorized under this approval.

4.1.2 The approval holder shall operate a wastewater system which shall include:

(a) the wastewater collection system;

(b) an activated sludge wastewater treatment plant includes all of the following:

(i) pre-screening,

(ii) flow equalization,

(iii) biological treatment (Activated Sludge Bioreactor),

(v) ultra-filtration membrane unit,

(vi) ultra-violet disinfection, and

(vii) treated wastewater outfall discharging to land on lease.

SECTION 4.2: CERTIFIED OPERATOR REQUIREMENTS

CERTIFIED OPERATOR

4.2.1 At all times, the operation of the wastewater system shall be performed by, or under the direction of, a person who holds a valid Level II (or higher) Wastewater Treatment Operator certificate in the province of Alberta.

SECTION 4.3: CHEMICALS USED

4.3.1 The approval holder is authorized to use sodium hypochlorite, citric acid, and caustic soda for membrane cleaning purposes

4.3.2 The approval holder shall not use any other chemicals in the wastewater treatment process, unless otherwise authorized in writing by the Director.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

SECTION 4.4: WASTEWATER DISCHARGE

4.4.1 Treated wastewater from the wastewater treatment plant shall only be disposed of:

(a) by surface discharge to the adjacent distribution field on the lease in accordance with the application; or

(b) as otherwise authorized in writing by the Director.

4.4.2 Signs shall be in place to identify the area that will be used for wastewater disposal in order to assist in preventing trespassing of any kind.

4.4.3 The approval holder shall consider, prior to discharge, the soil infiltration capability and the uptake by vegetation when determining the wastewater application rate.

SECTION 4.5: DISTRIBUTION FIELD

4.5.1 The approval holder shall, at a minimum, inspect the condition of the distribution field once per month.

4.5.2 The inspection in 4.5.1 shall, at a minimum, include:

(a) the soil conditions;

(b) the vegetative conditions; and

(c) the condition of the distribution system.

4.5.3 If excessive pooling of the distribution field is discovered, the approval holder shall:

(a) immediately suspend discharging as described in 4.4.1(a); and

(b) use on roads or leases for dust control or freeze down or in the SAGD process: or

(c) dispose of the wastewater at a wastewater treatment facility which holds a current approval or registration under the Act; or as otherwise authorized in writing by the Director.

SECTION 4.6: SLUDGE DISPOSAL

4.6.1 The approval holder shall only dispose of sludge at a facility holding a current approval or registration under the Act, unless otherwise authorized in writing by the Director.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

PART 5: LIMITS

SECTION 5.1: WASTEWATER

5.1.1 The approval holder shall ensure the treated wastewater discharge complies with the limits specified in TABLE 5-1.

TABLE 5-1: LIMITS FOR TREATED WASTEWATER

Parameter	Limit
$CBOD_5$	≤ 25 mg/L monthly arithmetic mean of samples taken three times per week in a calendar month
TSS	≤ 25 mg/L monthly arithmetic mean of samples taken three times per week in a calendar month
pH	6.5 to 8.5, monthly samples
Electrical Conductivity	< 2.5 dS/m, annual arithmetic mean of monthly samples
Sodium Adsorption Ratio	< 9, annual arithmetic mean of monthly samples

PART 6: MONITORING AND REPORTING

SECTION 6.1: MONITORING

6.1.1 The approval holder shall monitor the wastewater system as required in TABLE 6-1, at minimum.

TABLE 6-1: MONITORING – WASTEWATER SYSTEM

Parameter	Frequency (Minimum)	Sample Type	Sampling Location
UNTREATED WASTEWATER			
Volume of flow	Continuous, recorded daily	Calculated	Untreated Wastewater entering the wastewater treatment plant
$CBOD_5$	Once a week	Grab	Untreated wastewater prior to any treatment
TSS	Once a week	Grab	Untreated wastewater prior to any treatment
TREATED WASTEWATER			
Volume	Continuous, daily	Calculated	Treated wastewater being discharged
$CBOD_5$	Three days a week	Composite	Treated wastewater being discharged
TSS			
Total Coliform counts	Once a week	Grab	Treated wastewater after UV disinfection
Faecal Coliform counts			

TERMS AND CONDITIONS ATTACHED TO APPROVAL

Parameter	Frequency (Minimum)	Sample Type	Sampling Location
Electrical Conductivity	Once a month	Grab	Treated wastewater being discharged
Sodium Adsorption Ratio			
pH			
Rate of application	Monthly	Volume applied to site, Calculated	Wastewater being applied to the distribution field
UNAUTHORIZED RELEASES			
Release Volume	During the unauthorized discharge	Total Volume, Estimated	Wastewater bypassing the wastewater collection system, lift station(s), or wastewater treatment plant
			Spills or overflows from the wastewater system
$CBOD_5$	During the unauthorized discharge	Grab	At the release point
TSS			
SLUDGE DISPOSAL			
Sludge Volume	Total Volume	Estimated	Amount of sludge being trucked

SECTION 6.2: REPORTING

CONTRAVENTION

6.2.1 The report required in 2.1.2 shall contain, at a minimum, the following information:

(a) the number of the approval issued under the Act for the wastewater system, and the name of the approval holder who held the approval at the time the contravention occurred;

(b) the name, address, phone number, and responsibilities of all persons:

(i) who discovered the contravention,

(ii) operating the wastewater system at the time the contravention occurred,

(iii) who had charge, management or control of the wastewater system at the time the contravention occurred,

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(iv) who took any remedial action arising from the contravention, and

(v) notified or contacted with regard to the contravention;

(c) the contravention:

(i) date,

(ii) location (legal land description),

(iii) description,

(iv) duration, and

(v) cause;

(d) a summary of all:

(i) preventive measures and actions that were taken prior to the contravention,

(ii) measures and actions that were taken to mitigate any effects of the contravention,

(iii) measures and actions that will be taken to address any remaining effects and potential effects related to the contravention, and

(iv) proposed measures that will prevent future contraventions, including a schedule of implementation for these measures;

(e) any information that was maintained or recorded under this approval, as a result of the incident; and

(f) any other information requested by the Director in writing.

MONTHLY

6.2.2 The approval holder shall compile and retain a Monthly Wastewater Report which shall include, at a minimum, the following information:

(a) the results of the monitoring requirements of TABLE 6-1;

(b) the name and daily/weekly quantity of any chemical added to the wastewater in the wastewater treatment process;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(c) the name of the supervising operator responsible for the operation of the wastewater system;

(d) a summary of any operational problems; and

(e) a summary of the inspections pursuant to 4.5.1,

on or before the **15th** of the month following the month in which the information on which the report is based was collected.

ANNUALLY

6.2.3 The approval holder shall compile and retain an Annual Wastewater Report which shall include, at a minimum, the following information:

(a) the monthly arithmetic mean, including maximum and minimum values, of each parameter monitored, as outlined in TABLE 6-1;

(b) the name of the supervising operator responsible for the operation of the wastewater system;

(c) a summary of any incidents which required reporting in accordance with 2.1.1;

(d) a summary of any operational problems; and

(e) a summary of the inspections pursuant to 4.5.1.

6.2.4 The approval holder shall submit one copy of the Annual Wastewater Report in 6.2.3 to the Director on or before **February 28** of the year following the year in which the information on which the report is based was collected.

6.2.5 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 Annual Wastewater Report in 6.2.3.

PART 7: RECLAMATION AND DECOMMISSIONING

SECTION 7.1: GENERAL

7.1.1 The approval holder shall:

(a) submit a decommissioning and land reclamation plan to the Director a minimum of **six** (6) months prior to the wastewater treatment plant permanently ceasing operation;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(b) not commence reclamation or decommissioning until the approval holder has received written authorization from the Director; and

(c) notify the Director in writing within **thirty** (30) days of permanently ceasing operations.

DATED May 25, 2011

DESIGNATED DIRECTOR UNDER THE ACT

ERCB Energy Resources Conservation Board

COMMERCIAL SCHEME
Approval No. 11461C

MADE at the City of Calgary, in the Province of Alberta, on 8th day of November 2011.	ENERGY RESOURCES CONSERVATION BOARD

IN THE MATTER of a commercial scheme of Southern Pacific Resource Corp. (hereinafter called "the Operator") for the recovery of crude bitumen from the **Wabiskaw-McMurray Deposit in the Athabasca Oil Sands Area** from wells located in the project area outlined in Appendix A to this approval.

WHEREAS the Lieutenant Governor in Council, by Order in Council Number O.C. 350/2010 dated October 14, 2010, authorized the granting of Approval No. 11461;

WHEREAS the Energy Resources Conservation Board (ERCB) is prepared to approve an application by the Operator for an amendment to the scheme;

WHEREAS the ERCB deems it desirable for ease of reference to consolidate the amendment into the existing approval in a document to be known as Approval No. 11461C;

Therefore, pursuant to Section 13 of the *Oil Sands Conservation Act,* chapter O-7 of the Revised Statutes of Alberta, 2000, the ERCB hereby approves Amendment C to Approval No. 11461 and issues Approval No. 11461C as follows:

1) The Operator's scheme as described in

   a) Application No. 1615368,
   b) Proceeding No. 1665281,
   c) Application No. 1684907,
   d) Application No. 1689627,

   is approved, subject to the *Oil Sands Conservation Regulation* and the terms and conditions herein contained.[1]

2) The recovery of crude bitumen from wells located in the development area outlined in Appendix A is approved.

3) Clauses 1 and 2 do not preclude alterations in design and equipment, provided that the ERCB is satisfied that the alterations are compatible with the outline of the scheme, are made for the better operation of the scheme, and do not result in unacceptable adverse impacts.

4) The recovery process approved for the project is Steam-Assisted Gravity Drainage (SAGD) utilizing only steam as the injection fluid unless otherwise stipulated by the ERCB.

5) Unless otherwise stipulated by the ERCB, the production of bitumen from the project area outlined in Appendix A shall not exceed 1900 cubic metres per day (m^3/d) on an annual average basis.

6) The Operator shall conduct all operations to the satisfaction of the ERCB and in a manner that under normal operating conditions will permit:

   a) the recovery of the practical maximum amount of crude bitumen within the project area outlined in Appendix A,
   b) the conservation of the practical maximum volume of produced gas at the well pads and central facilities,
   c) the minimization of flaring to non-routine operations such as start-up, shutdown, emergencies, infrequent upsets, and maintenance depressuring, and
   d) the practical maximum reuse of produced water, with the minimum recycle rate being 90 per cent on an annual basis, unless otherwise stipulated by the ERCB.

7) Unless otherwise stipulated by the ERCB, the Operator shall:

   a) provide the ERCB with gamma ray, spontaneous potential, resistivity, neutron and density logs from total depth to surface casing for all vertical wells, and
   b) take full diameter cores of the entire bitumen-bearing interval of the Wabiskaw-McMurray Formation from not less than four evenly spaced vertical wells per section, and take full-diameter cores of bitumen-bearing intervals of other zones in the Mannville Group, if any, from at least one well per section, and at the ERCB's request

      i) analyze portions of such cores, and
      ii) provide suitable photographs of the clean-cut surface of each core slabbed.

8) Unless otherwise permitted by the ERCB, steam injection operations, having commenced at a well pad, shall continue until the well pad has produced a minimum of 50 per cent of the in-place volume of crude bitumen assigned to that well pad by the ERCB.

9) Where the Operator proposes to cease SAGD operations at a well pad that has produced less than 50 per cent of the in-place volume of crude bitumen and the ERCB's consent therefore is sought, the Operator shall advise the ERCB as to the following:

   a) the reason for proposing to cease SAGD operations,
   b) details of individual well workovers and recompletions attempted,
   c) detailed economics of continuing operations,
   d) the effect of ceasing SAGD operations on the bitumen recovery ultimately achievable from that part of the reservoir associated with the pad and immediately offsetting pads, and
   e) future plans for the well pad with reference to possible follow-up recovery techniques that could be applied and other zones that could be exploited.

10) The Operator shall ensure that sulphur recovery will be operational at the facilities before total sulphur emissions from flaring and combustion of gas containing hydrogen sulphide (H_2S) reach one tonne/day on a calendar quarter-year average basis, unless otherwise stipulated by the ERCB. The calendar quarter-year sulphur recovery shall not be less than set out in Table 1 of ERCB *Interim Directive (ID) 2001-03: Sulphur Recovery Guidelines for the*

Province of Alberta on the basis of the calendar quarter-year daily average sulphur content of produced gas streams flared and used as fuel at each central processing facility.

11) The Operator shall notify the ERCB of any proposed material alteration or modification of the SAGD scheme or to any equipment proposed for use therein prior to effecting the alteration or modification.

12) Where, in the opinion of the ERCB, any alteration or modification referred to in Clause 11 to the scheme or to any equipment proposed for use therein:

a) is not of a minor nature,
b) is not consistent with the scheme approved herein, or
c) may not result in an improved or more efficient scheme or operation,

the alteration or modification shall not be proceeded with or effected without the further authorization of the ERCB. The Operator must provide evidence that this major alteration or modification to the scheme or to any equipment will result in a benefit to the scheme or operation and be in the public interest.

13) Should the ERCB consider the alteration or modification to be major, it may request some or all of the information outlined in Clause 14 below, as it deems appropriate

14) Any plans for operations or development outside the approved development area shall be applied for to the ERCB for review. Such applications must:

a) describe the facility and infrastructure locations and the operation of the surface facilities. Justify any changes from those described in the original application and associated amendments. Evaluate the potential environmental impacts in the context of these changes and contrast with impacts predicted in the original application,
b) verify predictions and evaluate the performance of the environmental mitigation strategies proposed by the operator in the original application and associated amendments. Discuss how the approach to various mitigation strategies might be altered based on the findings of the evaluation and incorporated into future operations,
c) provide a summary of the information submitted for the Environmental Protection and Enhancement Act (EPEA), as well as any other environmental information related to the scheme and its amendment that may be required by an agency other than the ERCB,
d) provide geological and reservoir data that demonstrate that the reservoir in the proposed development area has been fully evaluated, including evaluation wells and seismic interpretation to fully understand where well pads and wells will be located. Submit updated bitumen, gas, and water mapping, reservoir properties, and reserves estimates for the existing development area, the proposed additional area, and the overall development area,
e) describe the Operator's participation in regional environmental initiatives. Discuss recommendations that have been generated from these regional initiatives and how these recommendations have been incorporated into the project,
f) provide a detailed description of the proposed amendment, including subsurface drainage pad design, such as the number of horizontal wells per drainage pad, the lateral spacing

between horizontal wells, the length and trajectory of each horizontal well, the horizontal well elevations, and the subsurface drainage area corresponding to each horizontal well. Provide cross-section profiles for each horizontal well to demonstrate that the location and design have been optimized to conserve bitumen,

g) provide a detailed discussion of the scheme performance to date, with specific emphasis on key factors affecting the success of the scheme, and how this experience has been incorporated into the operating of the existing scheme and the design and operation of the scheme within the proposed additional area, including but not limited to:

    i) the impact of top gas,
    ii) the impact of top water,
    iii) the impact of bottom water,
    iv) the effectiveness of the cap rocks, and
    v) the state of the steam chamber.

h) provide a discussion on modeling results, including the input data, modeling runs carried out, and the latest model predictions of bitumen recovery and pad production profiles based on history matching the field performance data. This information shall include:
    i) a description of the model used,
    ii) the input data files for the model cases run,
    iii) for each case run, cross-sections perpendicular to the wellbore showing the changing fluid saturations and temperature with time to illustrate the growth of the steam chamber to abandonment,
    iv) a discussion of the history match and parameters adjusted to achieve the match obtained, and
    v) a discussion of the prediction cases run, plots of the results for key performance predictions (i. e., rates, steam oil ratio), and how the results were used in operation of the existing scheme, in the design and operation of the proposed new area, and in the scheduling of future development of the scheme.

15) Notwithstanding any date by which any work, act, matter, or thing is by this approval required to be done, performed, or completed, the ERCB, if it considers it proper to do so, may by stipulation alter the dates specified.

16) The ERCB may,

    a) upon its own motion, or
    b) upon the application of an interested person,

    rescind or amend this approval at any time.

17) Approval No. 11461C rescinds Approval No. 11461B.

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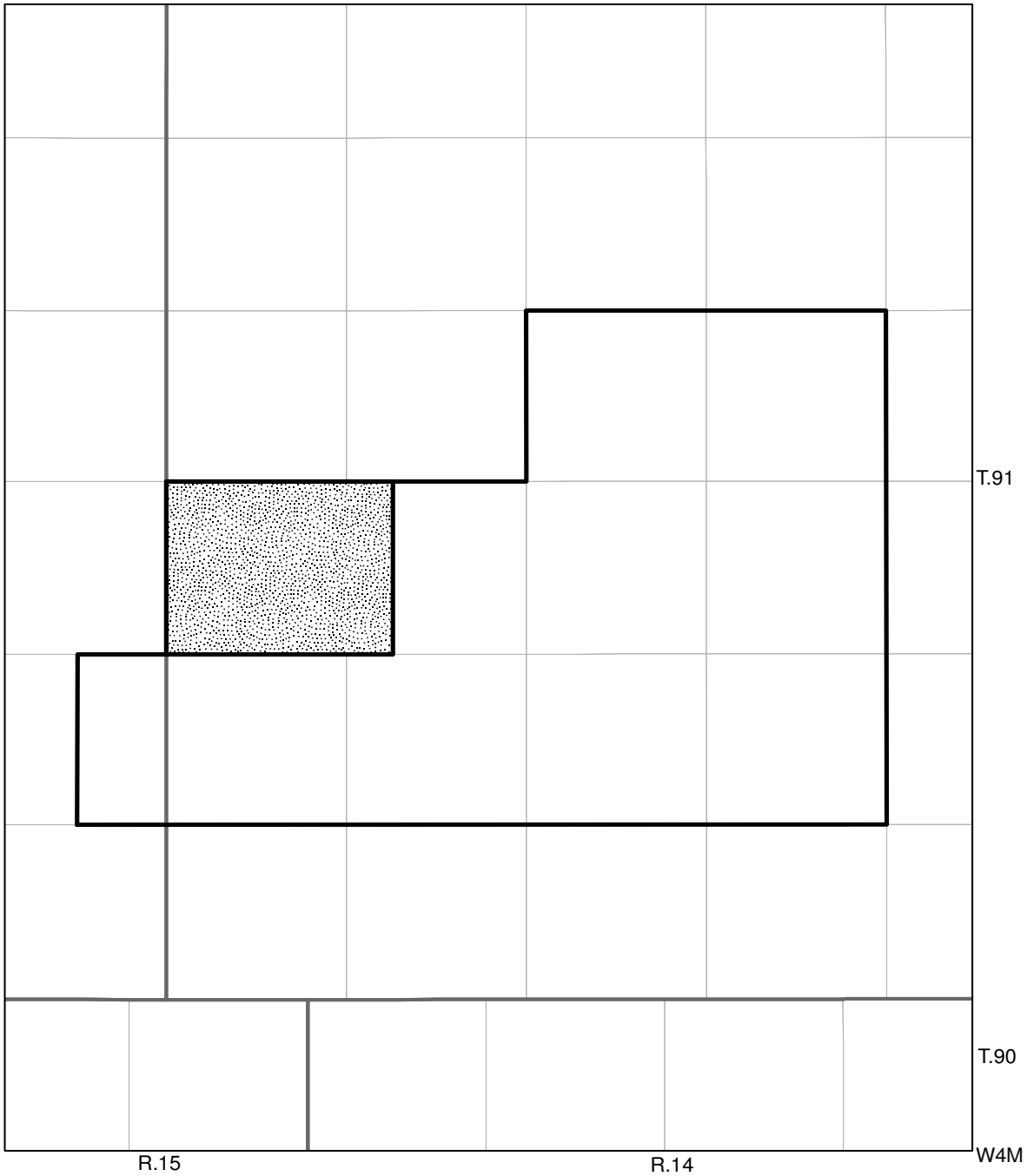

ATHABASCA OIL SANDS AREA
APPENDIX A TO APPROVAL NO. 11461C

Government of Alberta
Environment

LICENCE TO DIVERT WATER
PROVINCE OF ALBERTA
WATER ACT, R.S.A. 2000, c.W-3, as amended

LICENCE NO.: 00262149-00-00

FILE NO.: 00262149

PRIORITY NO.: 2009-08-28-001

EFFECTIVE DATE: 2010-12-06

EXPIRY DATE: 2012-12-05

SOURCE OF WATER: McKay Channel Empress Formation (see Table 3-1)

LICENSEE: Southern Pacific Resource Corp.

Pursuant to the *Water Act*, R.S.A. 2000, c.W-3, as amended, a licence is issued to the Licensee to:

operate a works and to divert up to 419,750 cubic metres of water annually from the source of water for the purpose(s) of industrial (SAGD)

subject to the attached terms and conditions.

Designated Director under the Act: Amit Banerjee
A/for Patrick Marriott, P. Eng.

Date Signed: 2010-12-06

DEFINITIONS

1.0 All definitions from the Act and the Regulations apply except where expressly defined in this licence.

1.1 In all parts of this licence:

(a) "Act" means the Water Act, RSA 2000, c. W-3, as amended;

(b) "Application" means the written submissions to the Director in respect of application number 001-00262149 and any subsequent applications for amendments of Licence No. 00262149-00-00;

(c) "Aquifer" means the underground water-bearing formation that is capable of yielding water, that is accessed by the works authorized by this licence;

(d) "Director" means an employee of the Government of Alberta designated as a Director under the Act;

(e) "Monitoring well" means the well used to monitor the water levels associated with the diversion of water authorized by this licence;

(f) "Production well" means any well used to divert water for the purpose of this licence;

(g) "Regulations" means the regulations, as amended, enacted under the authority of the Act; and

(h) "Water Use Reporting System" means the secure internet website provided by Alberta Environment at http://www.environment.alberta.ca/1286.html for submitting measuring and monitoring results electronically to the Director.

GENERAL

2.0 The Licensee shall immediately report to the Director by telephone any contravention of the terms and conditions of this licence at 1-780-422-4505.

2.1 The terms and conditions of this licence are severable. If any term or condition of this licence is held invalid, the application of such term or condition to other circumstances and the remainder of this licence shall not be affected thereby.

2.2 The Licensee shall not deposit or cause to be deposited any substance in, on or around the source of water that has or may have the potential to adversely affect the source of water.

2.3 The licensee shall comply with the terms and conditions of the "Water Use Reporting System User Consent".

DIVERSION OF WATER

3.0 This licence is appurtenant to the following:

(a) McKay Channel Empress Formation NE 08-091-14-W4 and SE 08-091-14-W4;

(b) Surface water runoff pond in NE 07-091-14-W4; and

(c) as described in Plans and Reports submitted under the *Water Act*.

3.1 The Licensee shall divert water only for the purpose(s) specified in this licence.

3.2 The Licensee shall divert water only from the source of water specified in this licence.

3.3 The works used to divert the water authorized by this licence shall include, at a minimum, all the production wells referred to in report 00262149-R001 McKay Channel Aquifer Groundwater Supply Technical Assessment and Oilfield Guideline Compliance STP McKay SAFD Project submitted with the application dated August 6, 2009.

3.4 The Licensee shall not exceed any of the limits specified in Table 3-1.

3.5 The Licensee shall not position the pump intake in the production well(s) at a depth greater than the maximum pump intake depth specified in Table 3-1.

TABLE 3-1

WELL NUMBER	LEGAL LAND DESCRIPTION for WELL LOCATION	PRODUCTION INTERVAL (metres below grade)	MAXIMUM PUMP INTAKE DEPTH (metres below grade)	LIMITS	
				MAXIMUM RATE OF DIVERSION (cubic metres per day)	MAXIMUM ANNUAL DIVERSION (cubic metres per calendar year)
production well	08-08-091-14-W4	75.6 -84.4	75.6	853	419,750
production well	16-08-091-14-W4	92.4 – 102.4	92.4	1,223	

3.6 Prior to diverting any water from the source of water, the Licensee shall equip each production well and the surface water runoff pond with a meter, which cumulatively measures the quantity of all water diverted during the term of this licence.

3.7 The Licensee shall maintain each measuring device referred to in 3.6 at all times.

3.8 Notwithstanding the allocation granted under this Licence, the Licensee is authorized to divert a maximum of 43,000 cubic metres from the surface runoff pond located NE 07-09-091-14-W4 on an annual basis.

MONITORING AND REPORTING

4.0 The Licensee shall establish monitoring well(s) as and when required in writing by the Director.

4.1 The Licensee shall use the data gathered from the production and observation well(s) to ensure that drawdown in the aquifer is limited in accordance with the *Water Conservation and Allocation Guideline for Oilfield Injection 2006.*

4.2 Unless otherwise authorized in writing by the Director, the Licensee shall measure the water levels in the following monitoring wells:

(a) identified in Schedule 1 on a weekly basis; and

(b) any other monitoring well(s) required by 4.0.

4.3 Unless otherwise authorized in writing by the Director, the Licensee shall measure the water level(s) in each production well on a weekly basis while water is being diverted.

4.4 Unless otherwise authorized in writing by the Director, the Licensee shall:

(a) monitor the total number of cubic metres of water diverted; and

(b) record the total number of cubic metres of water diverted

from each production well on a weekly basis.

4.5 Unless otherwise authorized in writing by the Director, the Licensee shall:

(c) monitor the total number of cubic metres of water diverted; and

(d) record the total number of cubic metres of water diverted

from the surface water runoff pond on a weekly basis.

4.6 When requested in writing by the Director, the Licensee shall:

(a) obtain a representative sample of water being diverted from each production well; and

(b) analyze the water collected in 4.6(a) for the following parameters:

(i) Total Dissolved Solids, Hardness, Alkalinity, pH, Calcium, Magnesium, Sodium, Potassium, Carbonate (CO_3), Bicarbonate (HCO_3), Sulphate (SO_4), Chloride, Nitrate, and Iron, and

(ii) any other parameter required by the Director

on an annual basis.

4.7 The Licensee shall record and retain all of the following information for a minimum of 5 years after being collected:

(a) the place, date and time of all monitoring, measuring and sampling;

(b) the results obtained pursuant to 4.2, 4.3, 4.4 and 4.5; and

(c) the name of the individual who conducted the monitoring, measuring and sampling stipulated in (a) and (b).

4.8 The Licensee shall report to the Director the results of the recording in 4.2, 4.3, 4.4 and 4.5 using the "Water Use Reporting System" and any other information required in writing by the Director.

4.9 The Licensee shall submit the report required in 4.8 on or before the end of the month following the month in which the information is based upon was collected.

4.10 The Licensee shall compile an Annual Water Use Report on or before February 28th of each year following the calendar year in which the information on which the report is based was collected.

4.11 The Licensee shall retain each Annual Water Use Report for a minimum of 5 years.

4.12 The Licensee shall submit an Annual Water Use Report to the Director:

(a) on or before February 28th of each calendar year following the year in which the information on which the report is based was collected; or

(b) within a time period specified in writing by the Director.

4.13 The Annual Water Use Report shall include, at a minimum, the following information collected during the previous calendar year:

(a) the total annual number of cubic metres of water diverted from each production well and the surface water runoff pond;

(b) the results obtained pursuant to 4.2, 4.3, 4.4 and 4.5;

(c) a review of the performance of the production wells during the past year and an assessment, supported by the analytical or model predictions, graphs and calculations of the performance of the aquifer;

(d) recommendations for adjustments of pumping rates, the number and location of observation wells, production wells and surface water run-off pond;

(e) a report prepared by a qualified groundwater consultant on the aquifer performance and recommendations for amendments to the licence; and

(f) any other information required in writing by the Director.

COMPLAINT INVESTIGATION

5.0 The Licensee shall:

(a) investigate all written complaints accepted by the Director relating to allegations of surface water and groundwater interference as a result of the operation of the production wells;

(b) provide a written report to the Director, within a time specified in writing by the Director, detailing the results of the investigation relating to the complaint accepted by the Director in 5.0(a) including:

(i) recommendations to remediate and/or mitigate the impact(s) such as:

(A) lowering the intake of the pump to compensate for a drop in water level,

(B) re-drilling the water well to an increased depth so as to allow the pump to be installed at a lower depth,

(C) drilling a new well, or

(D) providing an alternate water supply; and

(ii) any other information required by the Director.

(c) The Licensee shall satisfy the Director that the report submitted pursuant to 5.0 has identified remedial and/or mitigative measures relating to the alleged interference.

RECLAMATION

6.0 The Licensee shall reclaim all abandoned wells or other holes related to the water diversion in accordance with the Act and the Regulations.

6.1 The Licensee shall submit a reclamation report to the Director documenting the actions taken under 6.0 within 90 days after the reclamation is complete.

Date Signed: 2010-12-06

Anil Banerjee

A/P Designated Director under the Act
Patrick Marriott, P. Eng.

Schedule 1 Monitoring Wells

Location	Formation	Name	Completion Interval (m)
08-08-091-14-W4	Lower Sand Channel	08-OBS-LS	80.8 – 86.9
08-08-091-14-W4	Upper Sand Channel	08-OBS-US	55.8 – 61.9
08-08-091-14-W4	Quaternary Drift	08-OB-S	3.0 – 6.1
16-08-091-14-W4	Lower Sand Channel	16-OBS-LS	97.6 – 103.7
16-08-091-14-W4	Upper Sand Channel	16-OBS-US	27.4 – 30.5
16-08-091-14-W4	Quaternary Drift	16-OBS-S	5.3 – 8.4

AUC
Alberta Utilities Commission

Power Plant
Approval No. U2011-107

Dated on the 17th day of March, 2011	The Alberta Utilities Commission

Appendix 1 to Decision 2011-105 Southern Pacific Resource Corp. 16.95 MW Cogeneration Power Plant	 Application No. 1605960 Proceeding ID No. 534

Southern Pacific Resource Corp. (Southern Pacific), by Application No. 1605960, registered on March 4, 2010, applied to the Alberta Utilities Commission (AUC or the Commission) for approval to construct and operate a 16.95 megawatt (MW) cogeneration power plant (the power plant) in the Fort McKay area.

Pursuant to Section 11 of the *Hydro and Electric Energy Act*, the Commission approved the application in Decision 2011-105[1] and granted an approval to Southern Pacific, to construct and operate the power plant, subject to the provisions of the *Hydro and Electric Energy Act* and the *Alberta Utilities Commission Act*, any regulations made under the acts, any orders made under the acts, the Commission rules made pursuant to the *Alberta Utilities Commission Act*, and the following terms and conditions:

1. The power plant shall be located in the east half of Section 7, Township 91, Range 14, west of the Fourth Meridian, as further described in the application.

2. The power plant shall consist of three 5.65 MW gas turbine cogeneration units, with a total generating capacity of 16.95 MW, and as further described in the application.

3. Southern Pacific shall submit a progress report to the Commission in writing, once every three months, on construction progress pursuant to Section 3 of the *Hydro and Electric Energy Regulation*. The first progress report shall be filed with the Commission three months from the date of issuance of this approval.

4. Unless otherwise authorized by the Commission, construction of the power plant shall be completed by May 1, 2012.

5. Southern Pacific shall notify the Commission within 30 days of completing the construction of the power plant.

[1] Decision 2011-105: Southern Pacific Resource Corp., Fort McKay Cogeneration Power Plant, Application No. 1605960, Proceeding ID No. 534, March 17, 2011.

6. Southern Pacific shall obtain Commission approval prior to making any substantive changes to the power plant or substantially varying the design or specifications of the power plant from what was stated in the application or what the Commission has approved.

7. This approval is not transferable unless approved by the Commission.

8. The Commission may cancel or suspend this approval, in whole or in part, in accordance with Section 41 of the *Hydro and Electric Energy Act*, or may review this approval, in whole or in part upon its own motion, or upon an application by an interested party, in accordance with Section 10 of the *Alberta Utilities Commission Act*.

END OF DOCUMENT

AUC
Alberta Utilities Commission

Industrial System Designation
Order No. U2011-223

Dated on the 30th day of June, 2011	The Alberta Utilities Commission

Appendix 1 to Decision 2011-291 Southern Pacific Resource Corp. McKay Industrial System Designation	 Application No. 1605997 Proceeding ID No. 553

The Alberta Utilities Commission (AUC or the Commission), pursuant to Section 4 of the *Hydro and Electric Energy Act* and sections 2(1)(d) and 117 of the *Electric Utilities Act*, and Decision 2011-291[1] grants to Southern Pacific Resource Corp. (Southern Pacific) this order for an industrial system, subject to the provisions of the *Hydro and Electric Energy Act*, the *Electric Utilities Act* and the *Alberta Utilities Commission Act*, any regulations made under the acts, any orders made under the acts, the Commission rules made pursuant to the *Alberta Utilities Commission Act*, and the following terms and conditions:

1. The industrial system designation encompasses all facilities at Southern Pacific's McKay steam-assisted gravity drainage (SAGD) project site. The McKay SAGD project site would encompass a total of 10.5 sections, located in sections 7, 8, 9, 10, 15, 16, 17, 18, 21 and 22, Township 91, Range 14 and east half of Section 12, Township 91, Range 15, west of the Fourth Meridian, approximately 45 kilometres northwest of Fort McMurray.

2. The industrial system shall be comprised of the following major electric facilities:

   - One power plant consisting of three 5.65-megawatt (MW) gas turbine generator units with at total generating capacity of 17 MW.
   - A 25-kilovolt distribution system within Southern Pacific's McKay SAGD project site.

3. Southern Pacific shall apply to the Commission, pursuant to sections 14 and 15 of the *Hydro and Electric Energy Act*, for transmission facilities that are included in the subject industrial system.

4. The electric energy produced from and consumed by the subject industrial system is exempt from the operation of the *Electric Utilities Act*.

5. Southern Pacific shall notify the Commission of any proposed changes to the subject industrial system including changes in ownership that may result in contravening the principles and the criteria set out in Section 4 of the *Hydro and Electric Energy Act* and applied by the Commission in its decision to grant the application.

[1] Decision 2011-291: Southern Pacific Resource Corp. Industrial System Designation for Electrical System of McKay SAGD Project, Application No. 1605997, Proceeding ID No. 553, June 30, 2011.

6. Southern Pacific is directed to apply for an interconnection order within a reasonable time of the construction of transmission facilities in the vicinity of the industrial system, allowing a more economically feasible interconnection of the industrial system to the Alberta Interconnected Electric System.

7. Southern Pacific shall notify the Commission of any proposed changes to the subject industrial system that may affect other parties and (or) adjacent occupants, and shall make an application for the proposed changes pursuant to relevant sections of the *Hydro and Electric Energy Act*, if the Commission so directs.

8. The Commission may cancel or suspend this order, in whole or in part, in accordance with Section 41 of the *Hydro and Electric Energy Act* or may review this order, in whole or in part, upon its own motion or upon an application by an interested party, in accordance with Section 10 of the *Alberta Utilities Commission Act*.

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