



Yancoal Canada Resources Company Limited  
Southey Project

# Welcome

Yancoal Canada Resources Company Ltd.  
Community Information Session





## Yancoal Canada Resources Company Limited Southey Project

# Welcome

- Welcome to our Community Information Session on the Yancoal Canada Resources Company Limited (Yancoal) Southey Project.
- We have invited you here to:
  - Introduce ourselves;
  - Provide information about the proposed Yancoal Southey Project;
  - Provide information about the Saskatchewan Environmental Assessment process;
  - Provide a summary of the Environmental Assessment findings; and
  - Receive your comments and questions.





## Yancoal Canada Resources Company Limited Southey Project

# About Yanzhou Coal

- Yanzhou Coal Mining Company Limited (Yanzhou Coal) is an international mining company established in 1976, and listed in New York, Hong Kong, Shanghai and Sydney.
- More than 107,000 employees in China, Australia and Canada.
- Core business is in coal mining, coal chemical and fertilizer production, power generation and equipment production.
- Headquarters are located in Jining City, Shandong Province of East China.





## Yancoal Canada Resources Company Limited Southey Project

# About Yancoal Canada Resources

- Yancoal is a wholly-owned subsidiary of Yanzhou Coal.
- Yancoal was established in 2011 and has an office in Saskatoon, Saskatchewan.
- There are currently 10 employees in the Saskatoon office.
- Yancoal's primary business is mineral resource exploration, development and construction.



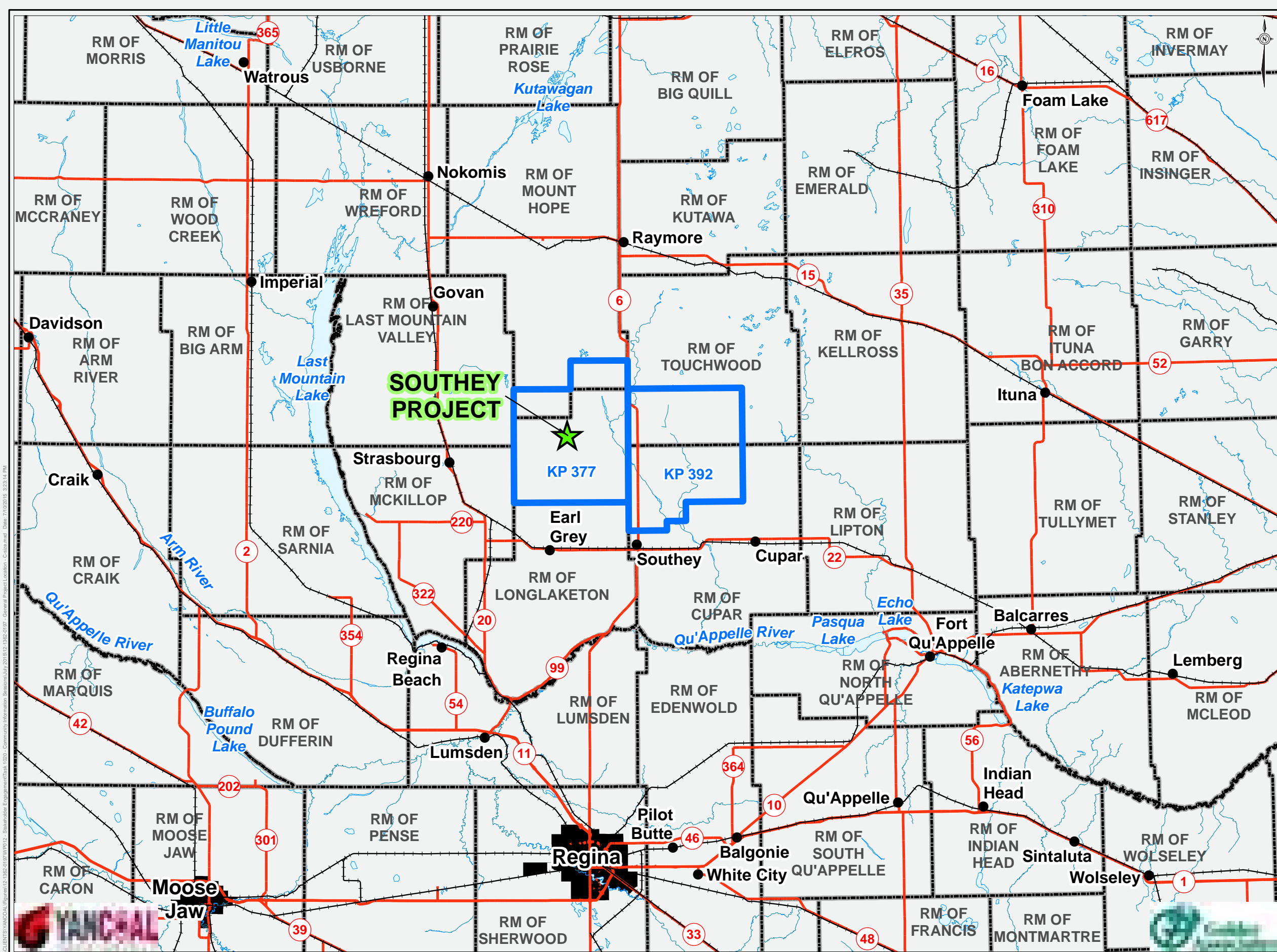


# Yancoal Canada Resources Company Limited

## Southey Project

# About the Project

- The Project is a greenfield potash mine that will produce potash through solution mining.
- Yancoal is proposing to develop the Southey Project approximately 60 km north of Regina, in the Rural Municipalities of Longlaketon and Cupar.
- The Project is located within subsurface mineral permits KP377 and KP392, west of Highway 6 and north of secondary Highway 731.
- The nearest communities are Earl Grey (21 km southwest of the Project), Strasbourg (23 km west of the Project), and Southey (28 km southeast of the Project).



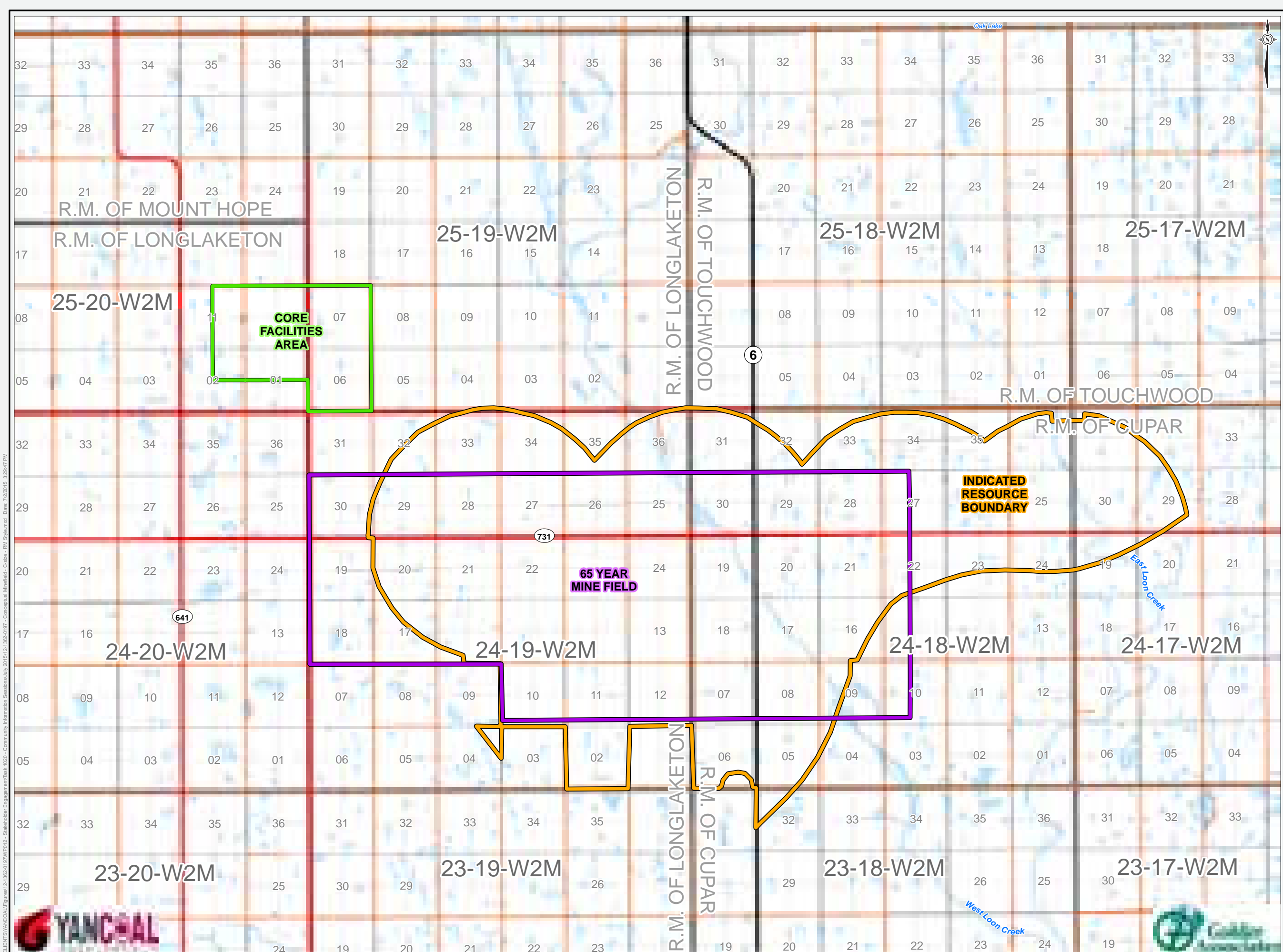


# Yancoal Canada Resources Company Limited

## Southey Project

# About the Project

- The Southey Project will extract potash ore from the Patience Lake, Belle Plaine, and Esterhazy members of the Saskatchewan Prairie Evaporite Formation.
- The Project will be designed to produce 2.8 million tonnes of potash per year.
- The anticipated life span of the Project is 65 to 100 years.
- Underground pipelines will transport water and brine from the core facilities area to the mine field.

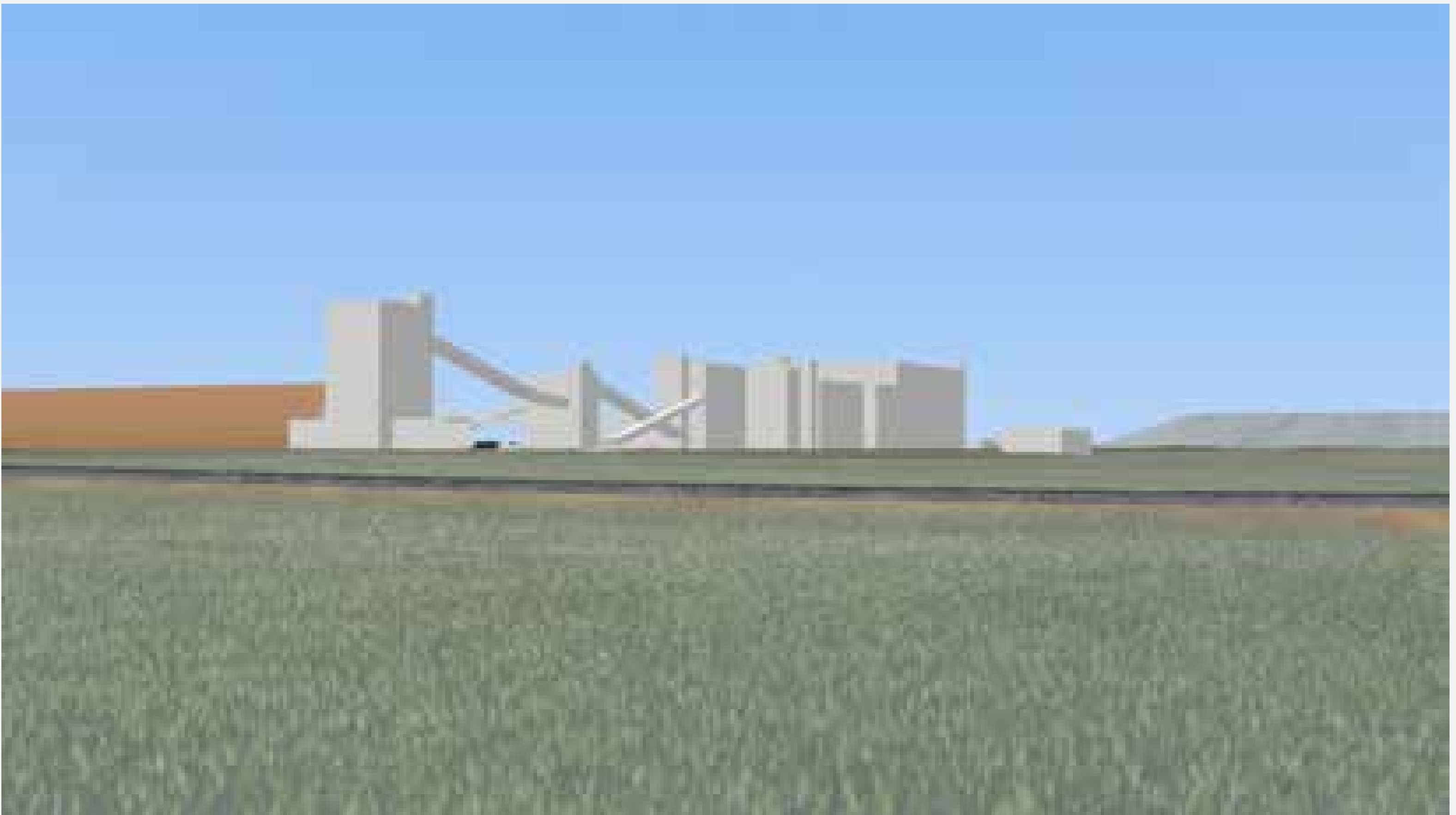


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Southey Project

# About the Project

The core facilities area will include:

- Process plant;
- Administration building and dry facilities (safety and first aid, lab and security);
- Mill warehouse;
- Maintenance shop;
- Product storage;
- Rail loadout; and
- Tailings management area.

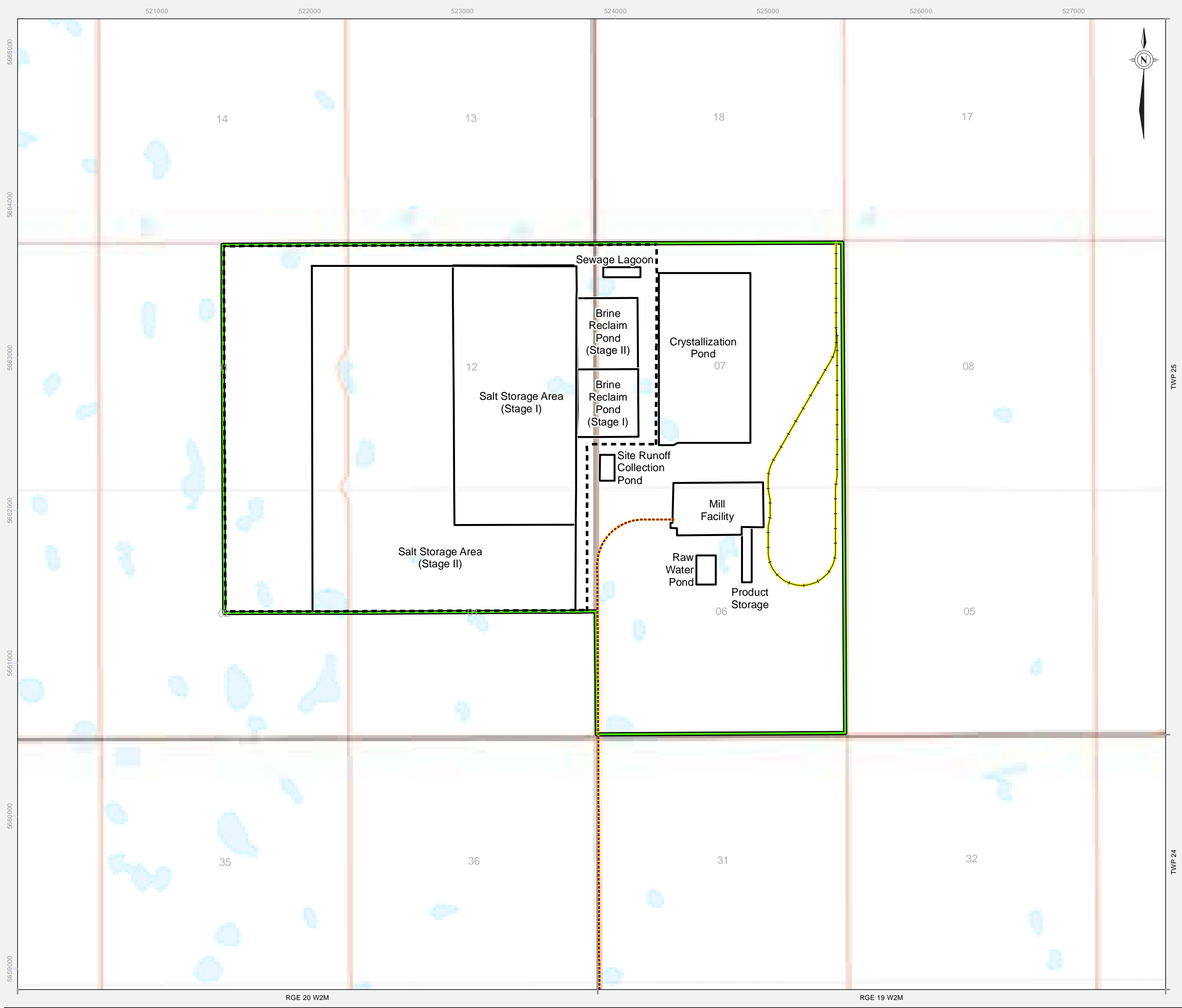




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# Core Facilities Area Layout



- LEGEND**
- ROAD
  - TOWNSHIP AND RANGE BOUNDARY
  - SECTION BOUNDARY
  - PROPOSED ACCESS ROAD
  - PROPOSED RAIL LOOP
  - CORE FACILITIES AREA
  - PROPOSED SITE INFRASTRUCTURE
  - TAILINGS MANAGEMENT AREA

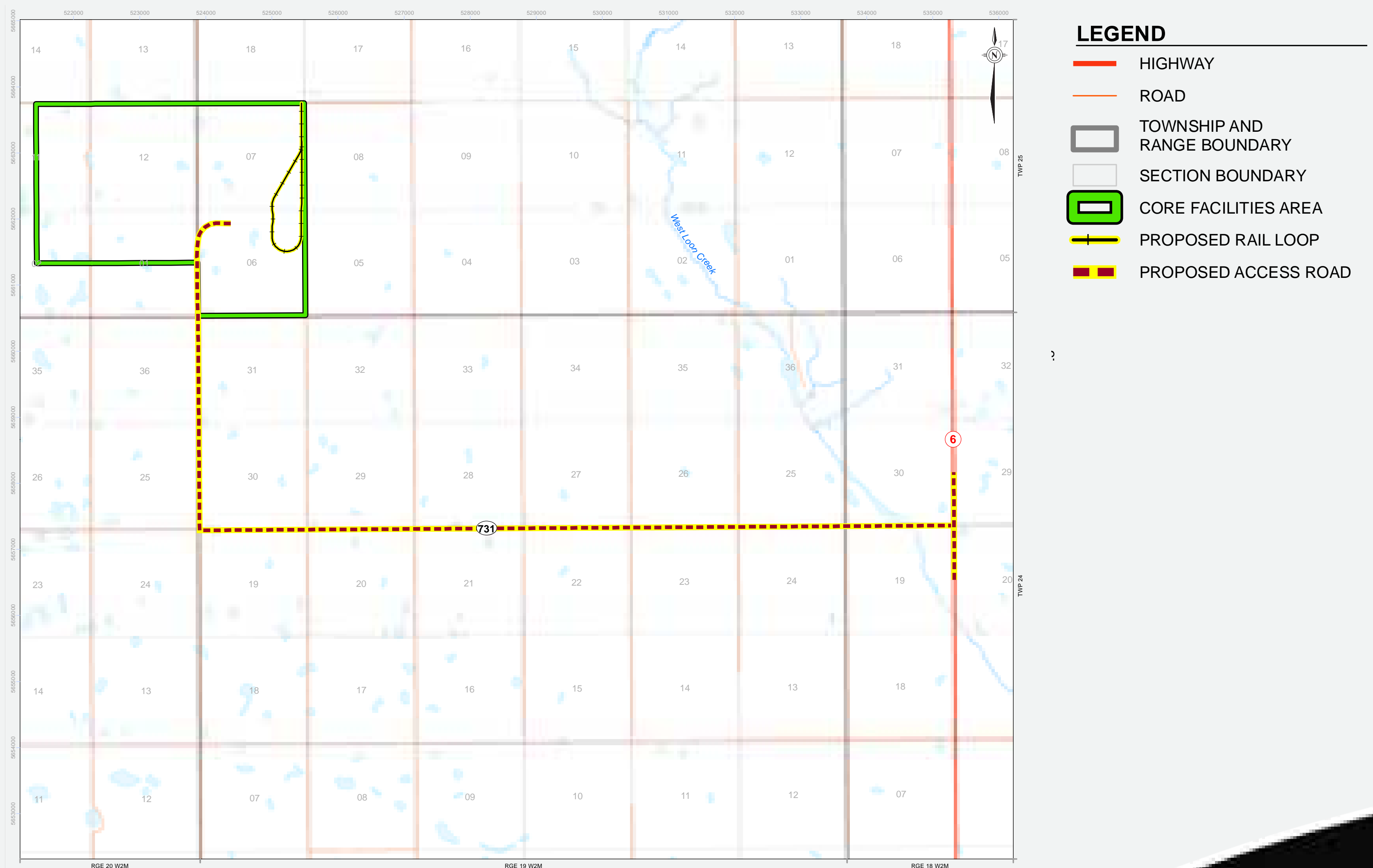


# Yancoal Canada Resources Company Limited

## Southey Project

## Roads

- Yancoal will upgrade the access road to the core facilities area to accommodate additional traffic and heavy loads.
  - This will include Grid Road 731 from Highway 6 to the core facilities area.
- Some existing road closures will be necessary within the core facilities area.
- Yancoal will work with the Rural Municipality to discuss the need for road alterations or upgrades to facilitate local traffic movement around the core facilities area.



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# Project Utilities

- Yancoal will require the following utility services:
  - Water - Provided by SaskWater.
  - Power - Provided by SaskPower.
  - Natural Gas - Provided by TransGas.
  - Telecommunications - Provided by SaskTel.
  - Rail Line - Provided by either Canadian National (CN) or Canadian Pacific (CP).
  - Yancoal will select the rail line provider by end of 2015.
- Yancoal will work directly with each utility provider, however they will be responsible for their route selection, environmental assessment, land acquisition, engineering and construction.



# Construction Camp

- A temporary camp will be built for workers during construction. It is anticipated that the camp will be built to house up to 1,500 workers.
- Yancoal is still in the process of evaluating options for the location of the camp.
- It is anticipated that the camp will be located as close to the core facilities area as possible to reduce the amount of traffic on the roads.
- Part of the feasibility study currently underway is to explore options to optimize the camp.
  - This includes options for on site water and effluent treatment (e.g. a closed system).
- Camp Security and Emergency Services are also being considered.



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# Anticipated Milestones

- **December 2015:** Complete Feasibility Study;
- **2016 (Q1):** Anticipate Environment Assessment Approval;
- **2016 (Q2):** Make internal decision to proceed;
- **2016 (Q2):** Environmental Permitting;
- **2016 (Q3 and Q4) to 2019:** Initiate Construction;
  - Site Grading
  - Road upgrades
  - Engineering
  - Procurement
  - Construct buildings and plant facilities
  - Drill wells for preliminary cavern development
- **2020:** Commissioning and operation.





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# Southey Project

# Schedule

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# Potash

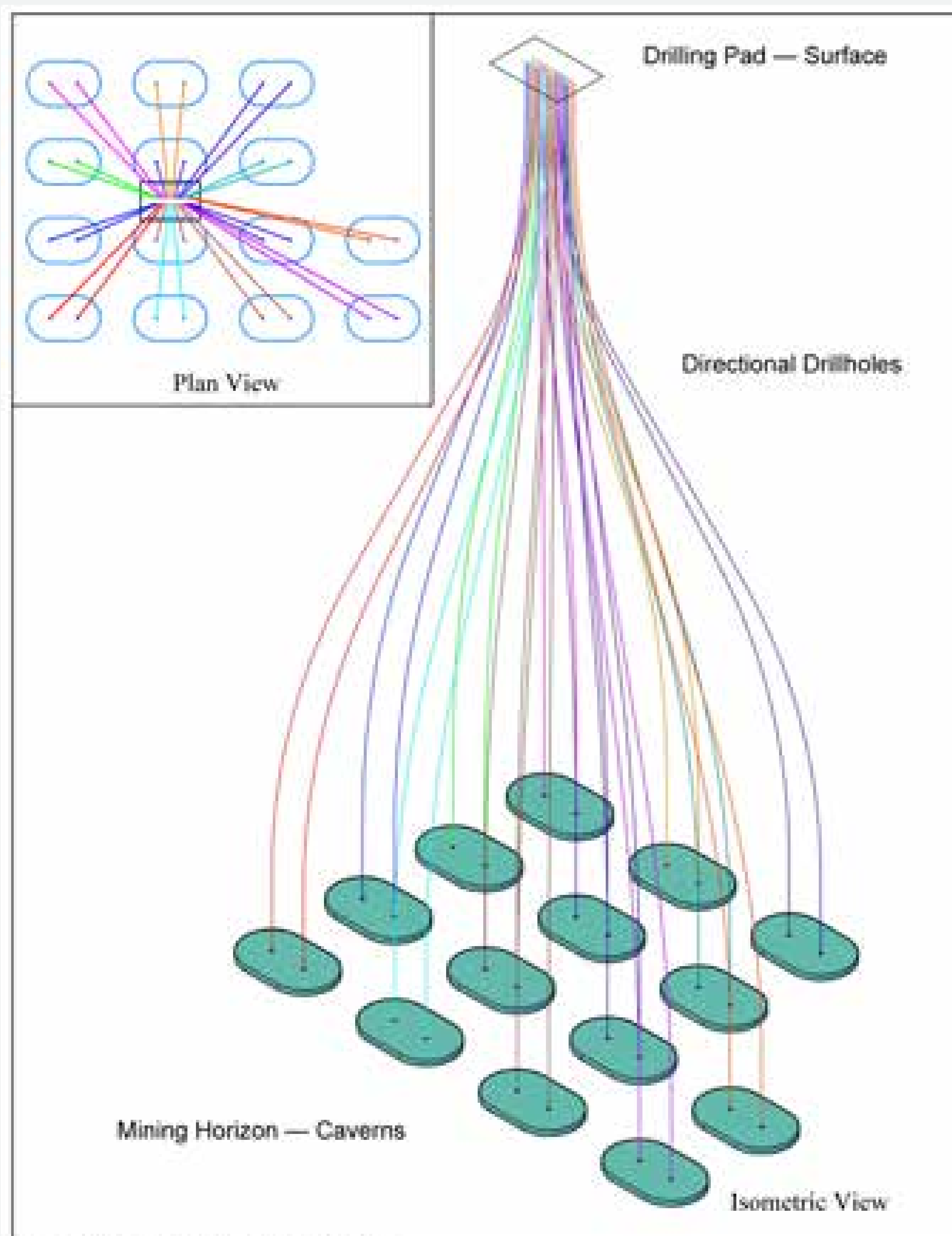
- Potash is a common name for Potassium Chloride or KCl.
- Saskatchewan has the largest potash industry in the world, accounting for approximately 40% of the worlds trade in potash.
- The leading use of potash is for fertilizer.





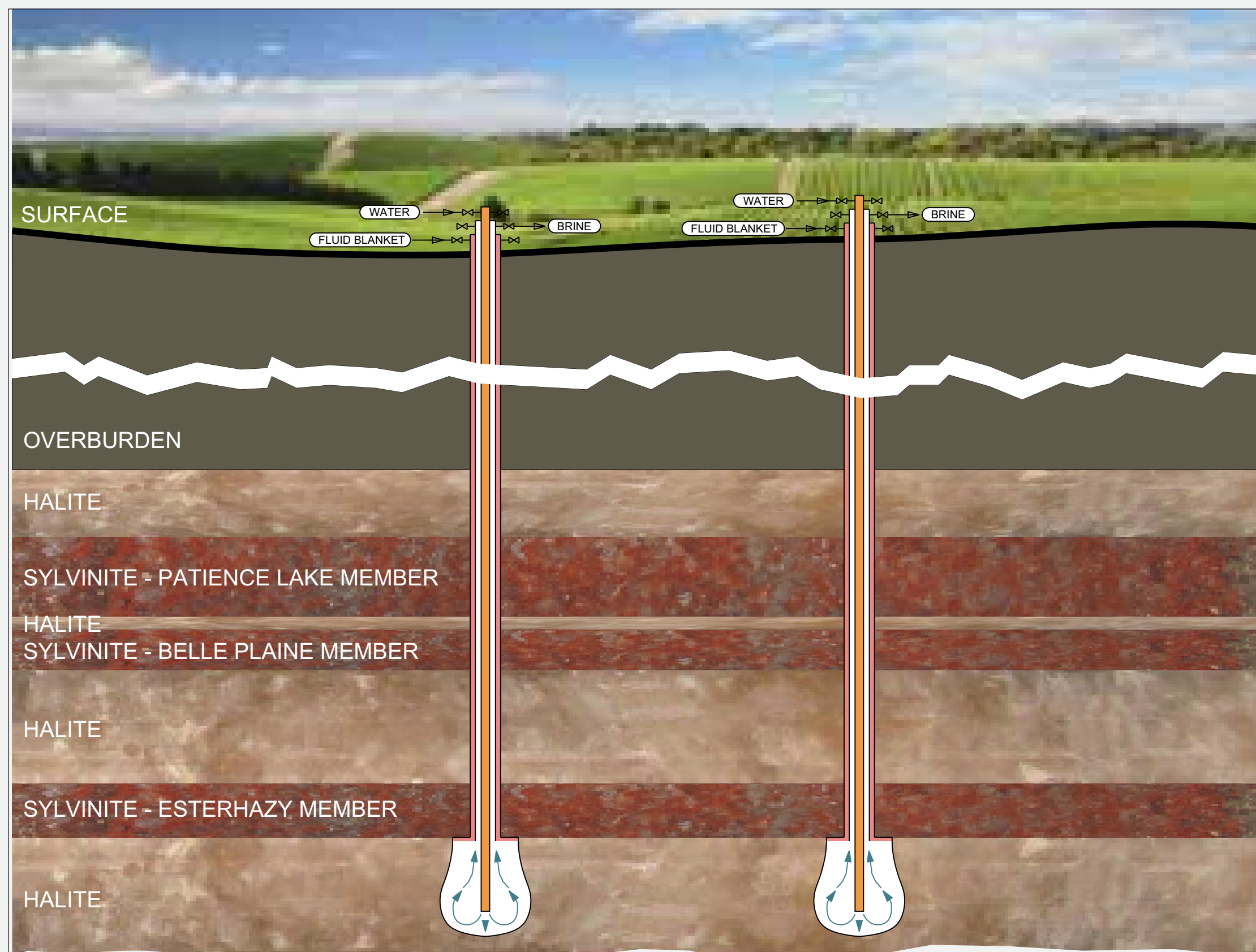
# Yancoal Canada Resources Company Limited Southey Project

## Cavern Layout

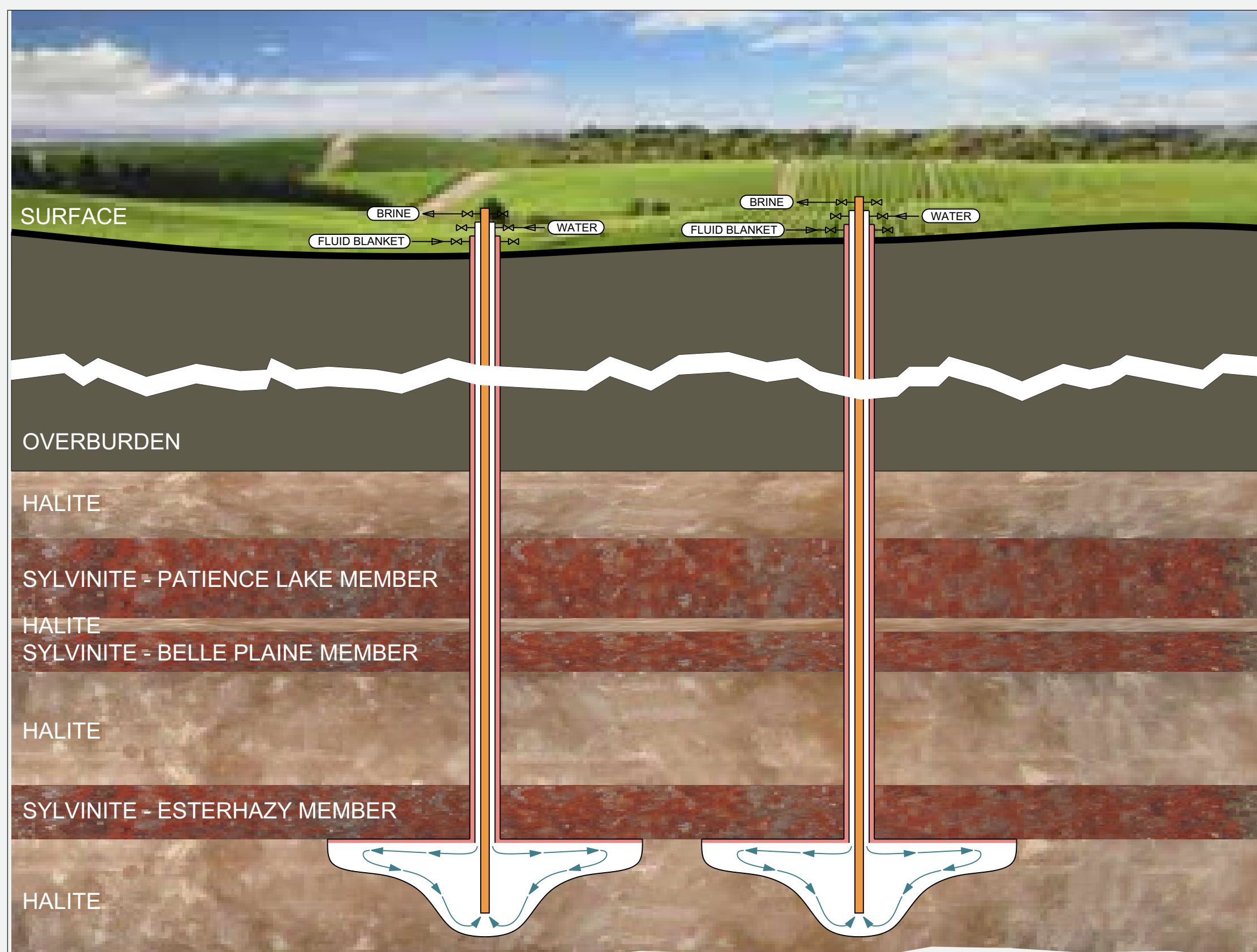


# Yancoal Canada Resources Company Limited Southey Project

## Sump Development

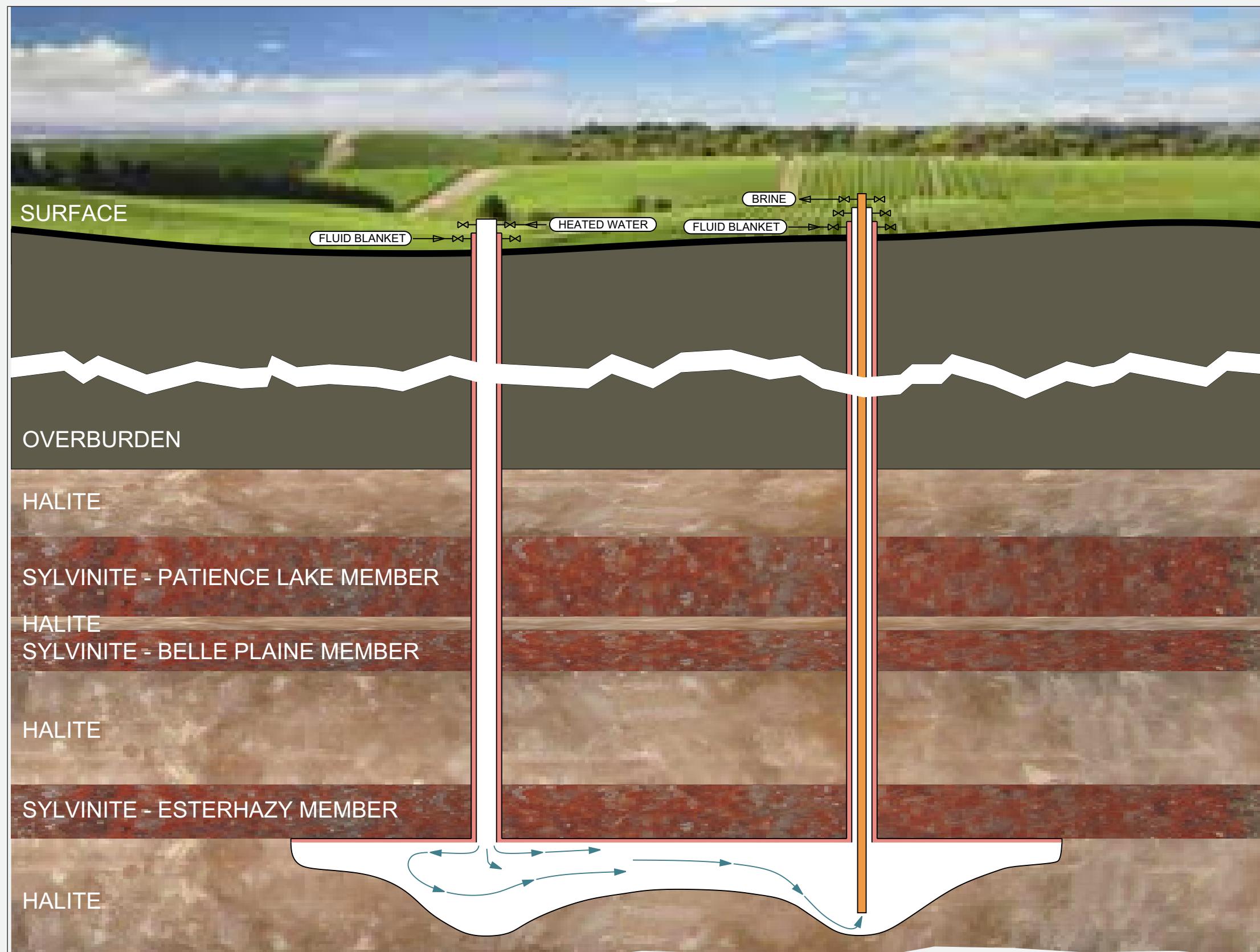


## Sump Connection

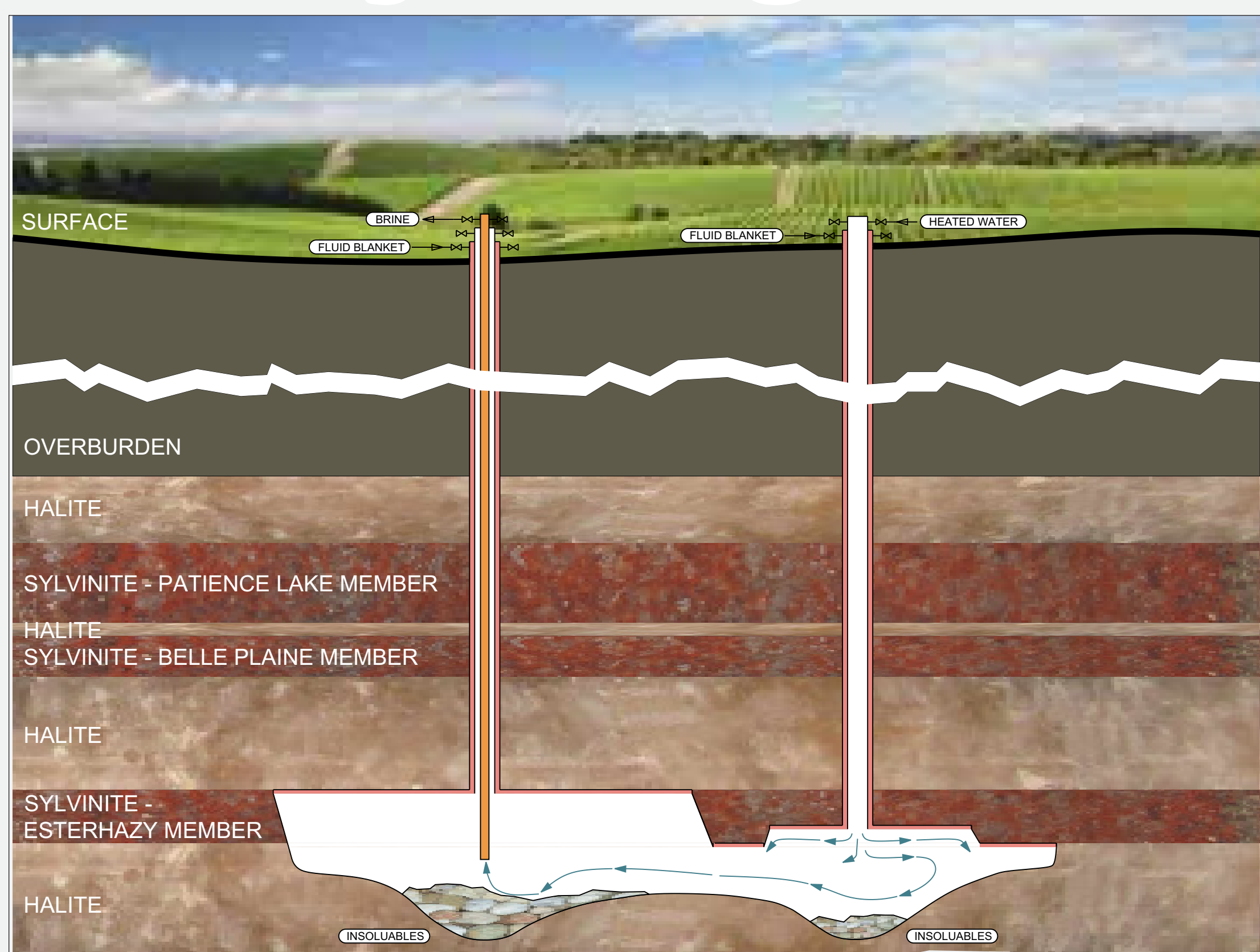


# Yancoal Canada Resources Company Limited Southey Project

## Roof Development



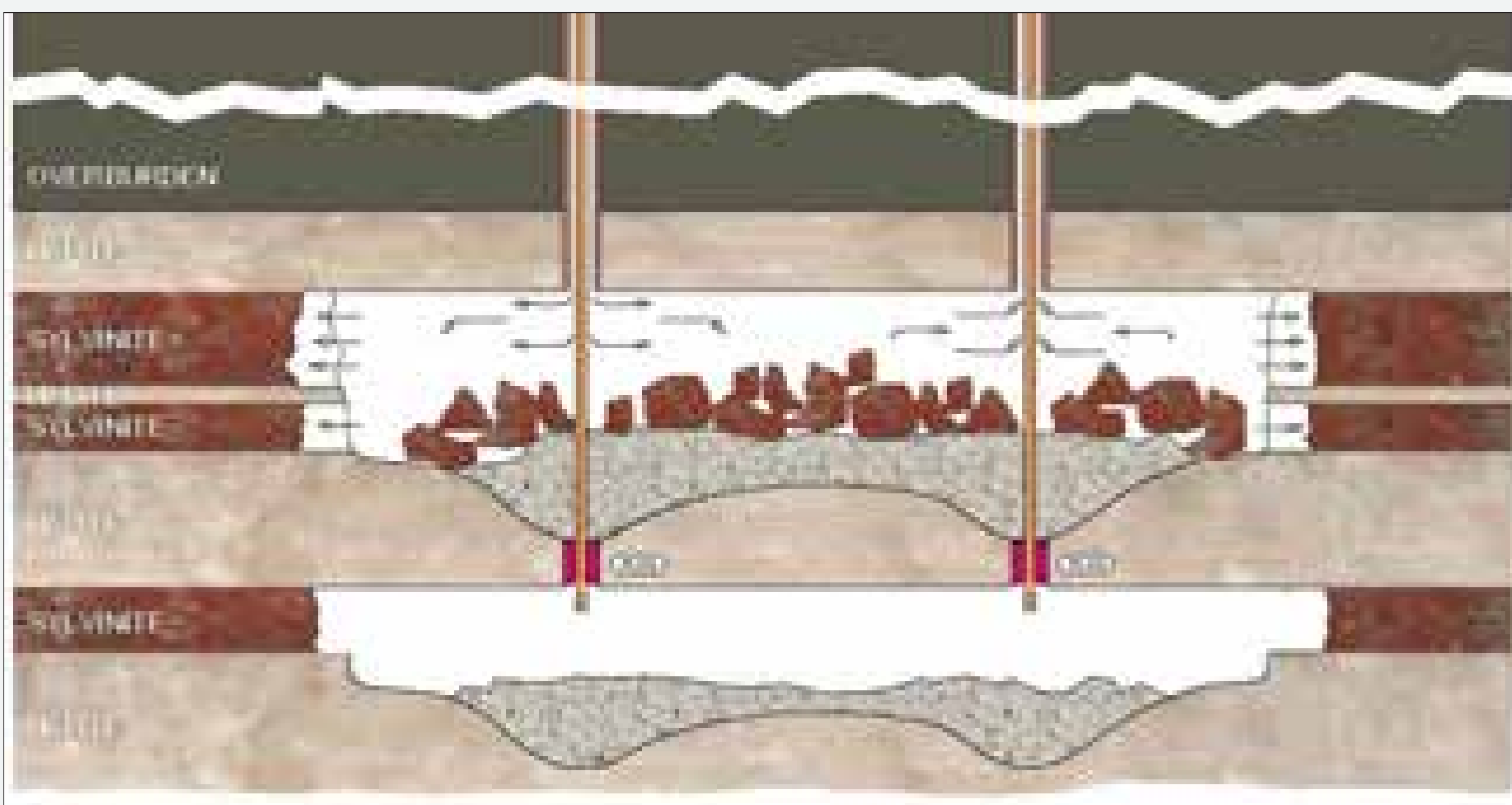
## Primary Mining



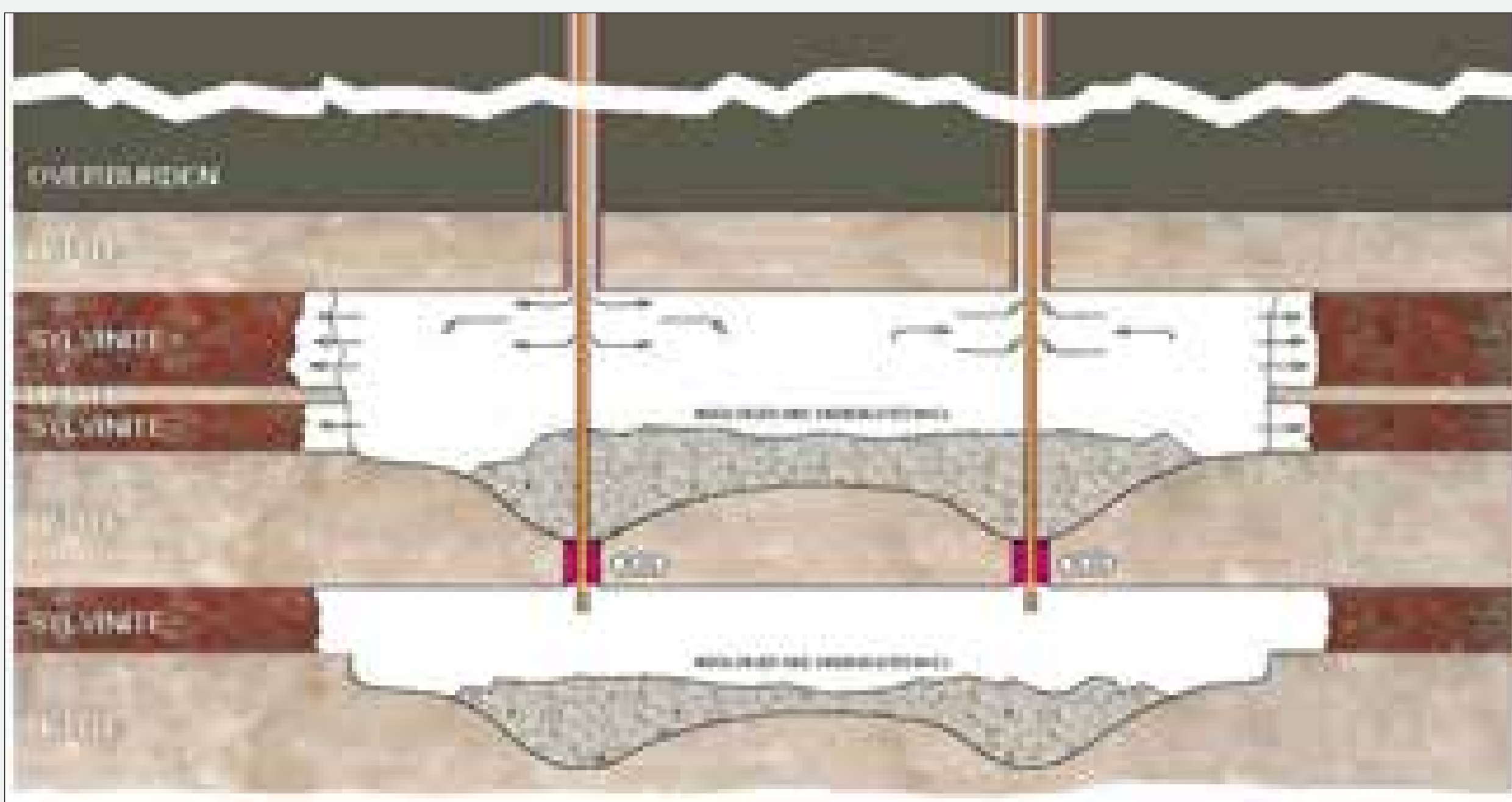


# Yancoal Canada Resources Company Limited Southey Project

## Interbeds



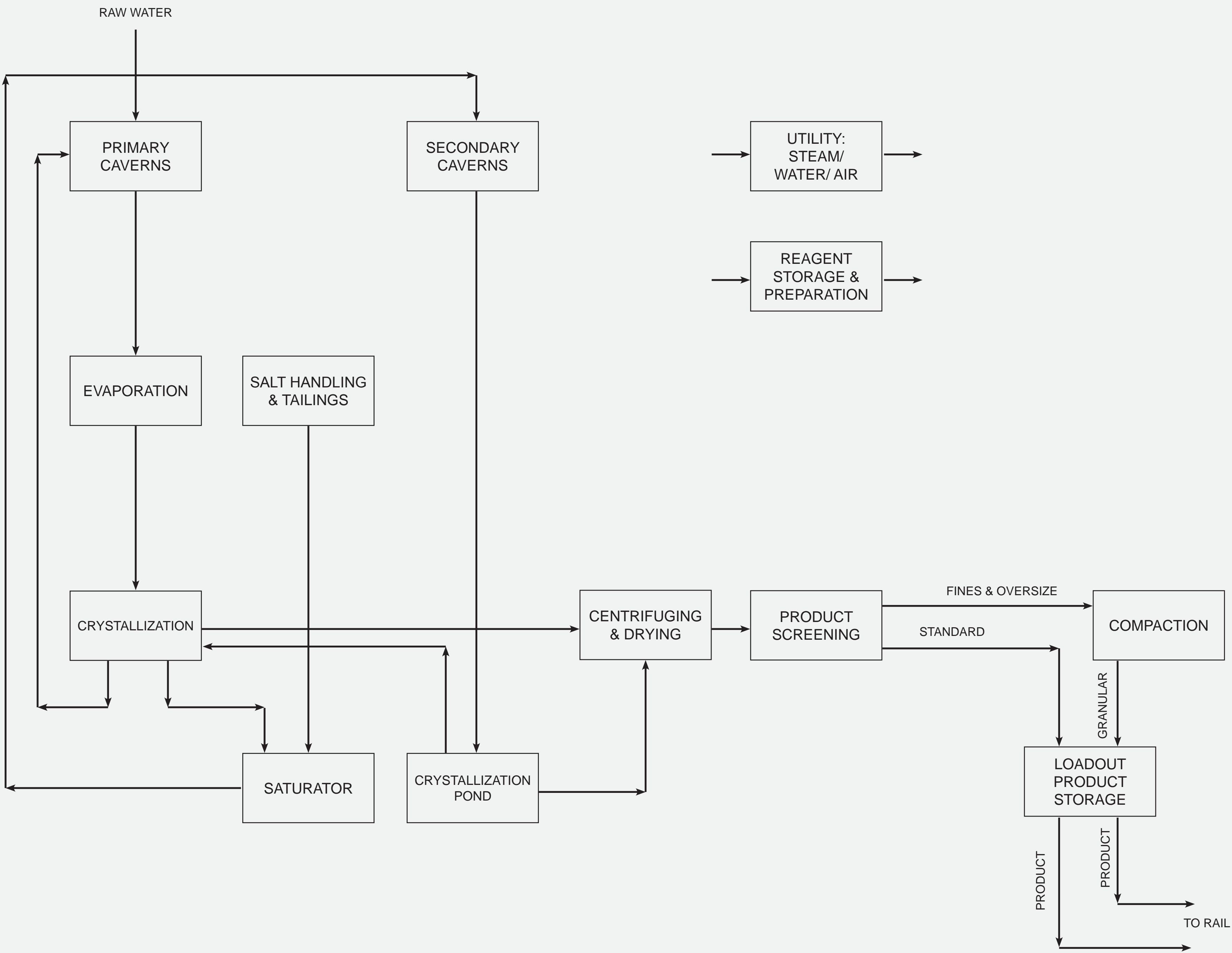
## Secondary Mining





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# Production of Potash



# Environmental Assessment

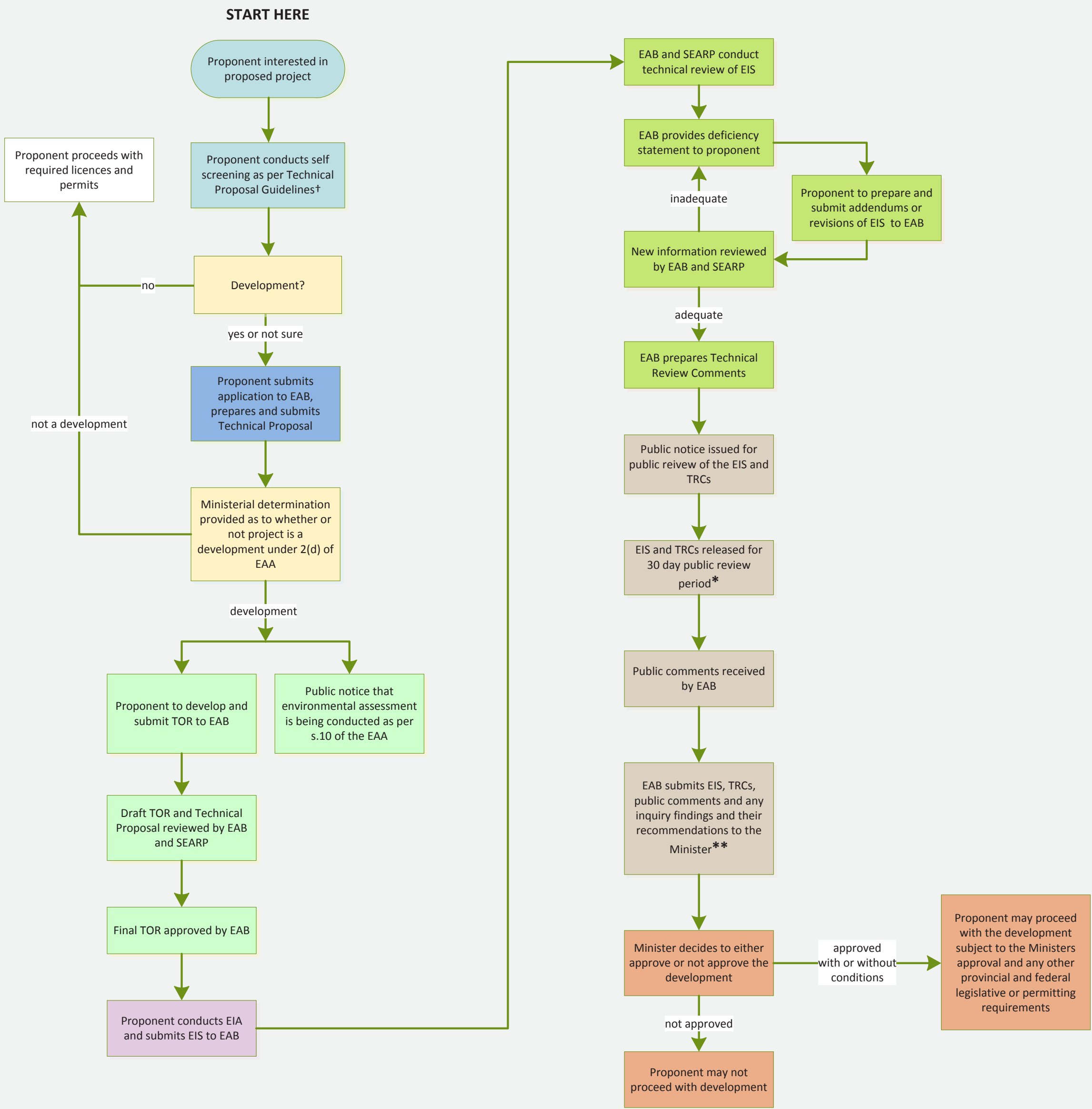
- An Environmental Assessment evaluates and identifies potential changes caused by Project interactions with the existing biophysical and socio-economic environments.
- The Environmental Assessment process involves:
  - Issue scoping;
  - Engagement;
  - Baseline (or existing conditions) data collection and required scientific studies;
  - Identifying recommended mitigation practices, procedures and policies; and
  - Analyzing and predicting positive and negative effects.
- Details are presented to regulatory agencies and the public as an Environmental Impact Statement.
- Once the Environmental Impact Statement has been submitted the regulatory agencies will determine if a project is acceptable and can proceed.





# Environmental Assessment

## The Saskatchewan Environmental Assessment Process



Proposal Development

Application

Screening

Scoping

Impact Assessment

Review

Public Comment

Decision by Minister

**Key**

TPG – Technical Proposal Guidelines  
EAB – Environmental Assessment Branch  
EAA – The Environmental Assessment Act  
TOR – Terms of Reference  
SEARP – Saskatchewan Environmental Assessment Review Panel  
EIA – Environmental Impact Assessment  
EIS – Environmental Impact Statement  
TRCs- Technical Review Comments

\* Any person may: make a written submission to the minister within 30 days from the date when the minister first gives notice or if the minister considers it appropriate, within an additional period of 30 days.  
\*\*Minister may require public meetings or public inquiry into all or any aspect of the development at any time prior to making a decision about the development

†Changes to a development with prior Ministerial Approval require review by EA Branch

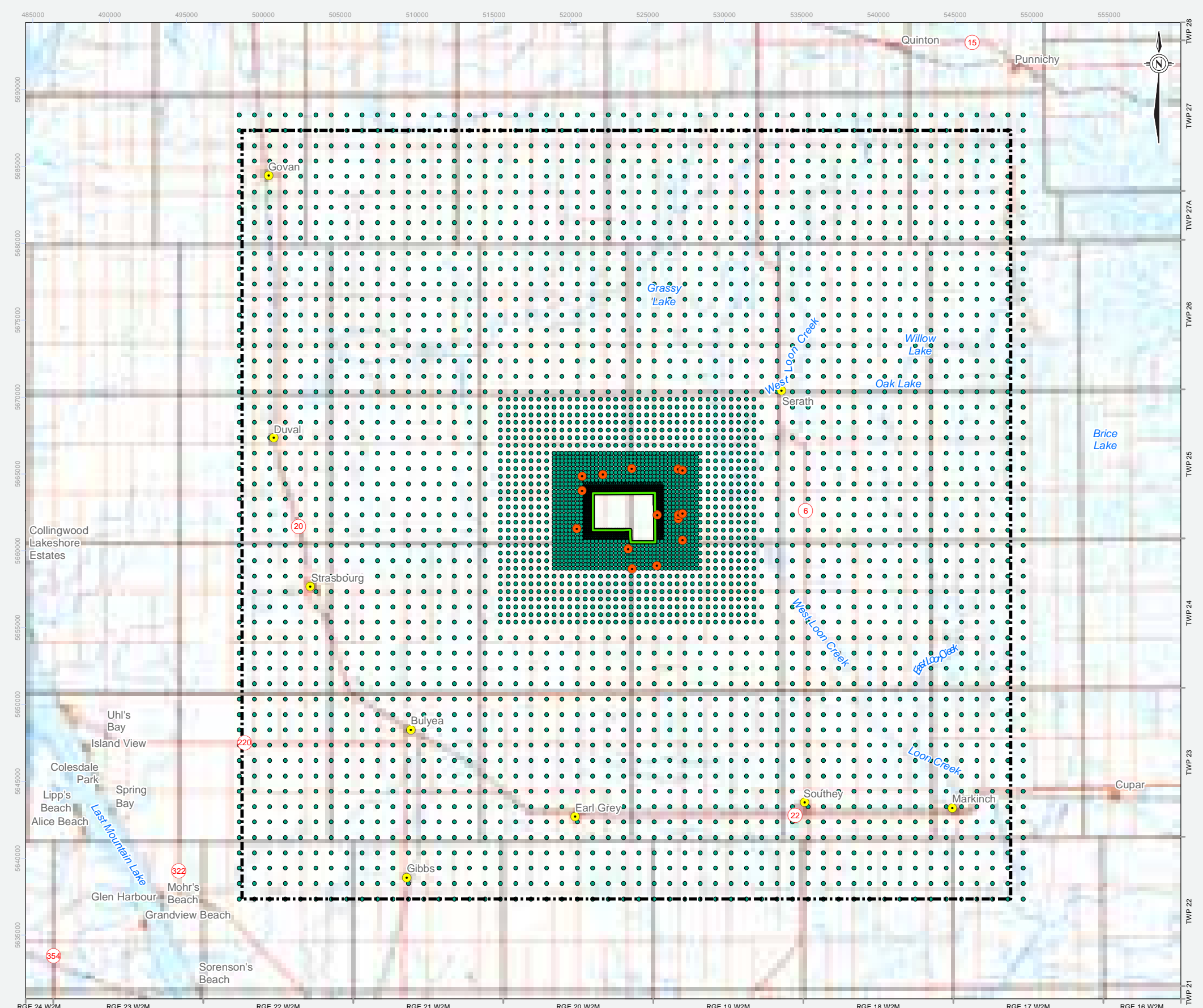


# Yancoal Canada Resources Company Limited Southey Project

## Atmospheric Environment

### What was assessed:

- Carbon monoxide (CO);
- Sulphur dioxide (SO<sub>2</sub>);
- Nitrogen dioxide (NO<sub>2</sub>);
- Potash (KCl);
- Greenhouse gases (GHGs) including:
  - Carbon dioxide (CO<sub>2</sub>);
  - Nitrous oxide (N<sub>2</sub>O);
  - and
  - Methane (CH<sub>4</sub>).
- Particulate matter (PM) including:
  - Particulate matter with aerodynamic diameter less than 2.5 micrometres (µm) (PM2.5);
  - Particulate matter with aerodynamic diameter less than 10 µm (PM10);
  - Total suspended particulate matter with aerodynamic diameter less than 40 µm (TSP);



LEGEND	
	COMMUNITY
	HIGHWAY
	ROAD
	RAILWAY
	TOWNSHIP AND RANGE BOUNDARY
	CORE FACILITIES AREA / FENCE LINE
	EFFECTS STUDY AREA
RECEPTOR BY TYPE	
	COMMUNITY
	RESIDENCE
	GRID



# Atmospheric Environment

## Results:

- Maximum predicted  $\text{NO}_2$ ,  $\text{SO}_2$ , CO, PM<sub>2.5</sub>, and TSP concentrations, and KCl deposition for all averaging periods complies with their respective ambient air quality standards.
- Results for the Yancoal project predict a daily maximum plus background concentration for PM<sub>10</sub> of  $53.4 \mu\text{g}/\text{m}^3$ , which is slightly above the Saskatchewan Ambient Air Quality Standard of  $50 \mu\text{g}/\text{m}^3$ .
- The Ministry of Environment requires that a background value of  $36.3 \mu\text{g}/\text{m}^3$  be used as the background concentration for PM<sub>10</sub> in the Southeastern region of the Province. This background value was derived from urban measurements, and may not accurately reflect background rural air quality at the Project.
- Yancoal is currently measuring particulate matter concentrations at the proposed Project location to better determine the actual background concentrations.
- It is concluded that the Project's cumulative effects on the atmospheric environment are not significant.

# Noise

- In Saskatchewan, there are no provincial noise requirements or standard methods that govern noise levels associated with industrial activities. The Alberta Energy Regulator (AER) regulates noise through directive 038: Noise Control. The AER Directive 038 represents best operating practices for facilities in Alberta and commonly is used in noise assessments for industrial facilities in Saskatchewan.

## **What was assessed:**

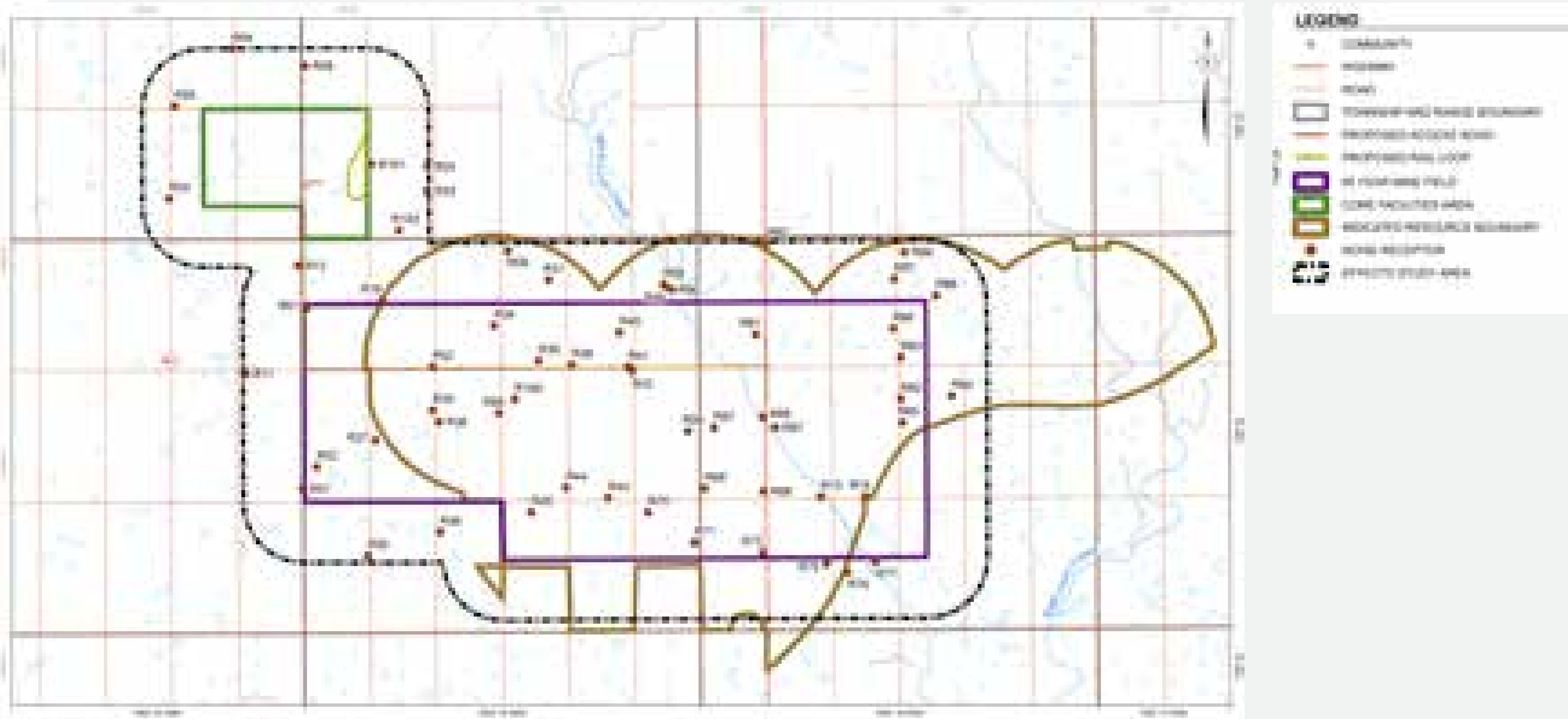
- The focus of the acoustic environment assessment is on determining changes to existing ambient noise levels resulting from the Project and comparing the cumulative noise levels due to the Project to the thresholds specified in the AER Directive 038.
- Noise receptors are considered to be any permanent or seasonally-occupied dwellings used at least six weeks out of the year within 1.5 km of the Project boundaries. A total of 60 relevant receptors were identified.





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Noise



Results:

- Noise levels associated with Project operations will not exceed thresholds specified in Directive 038 for any receptor with the exception of R101.

Receptor Location	AER Cumulative Noise Level <sup>(a)</sup> (dBA)		Permissible Sound Level (PSL) <sup>(b)</sup> (dBA)		Difference (PSL – AER Cumulative Noise Level) (dB)			Ambient Sound Level (PSL) <sup>(c)</sup> (dBA)		Difference (AER Cumulative Noise Level - ASL) (dB)	
	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime		Daytime	Nighttime	Daytime	Nighttime
101	53.0	45.6	50	40	-3.0	-5.6	45	35	8.0	10.6	Above Criteria Limits

(a) Consists of the logarithmic addition of predicted Project noise level and ASL.  
(b) PSL values defined according to Directive 038 and presented in Table 12.  
(c) ASL values defined according to Directive 038 and presented in Table 13.  
dBA = A-weighted decibels; PSL = Permissible Sound Level; ASL = Ambient Sound Level; AER = Alberta Energy Regulator. To mitigate this, equipment will be maintained and will comply with federal and provincial air emission standards, and operational activities (e.g., movement of rail cars) will be limited to daytime hours.

# Hydrogeology

## **What was assessed:**

- Groundwater chemistry;
- Groundwater levels; and
- Vertical and horizontal migration.

## **Results:**

- Long term changes to groundwater quality are expected to occur only within the footprint of the TMA.
- The details of the monitoring program, as well as various threshold criteria for implementation of mitigation, will be determined in the detailed design in support of licensing the Project.
- Changes to groundwater from the Project are predicted to have no significant effect on the continued suitability of groundwater for human use.

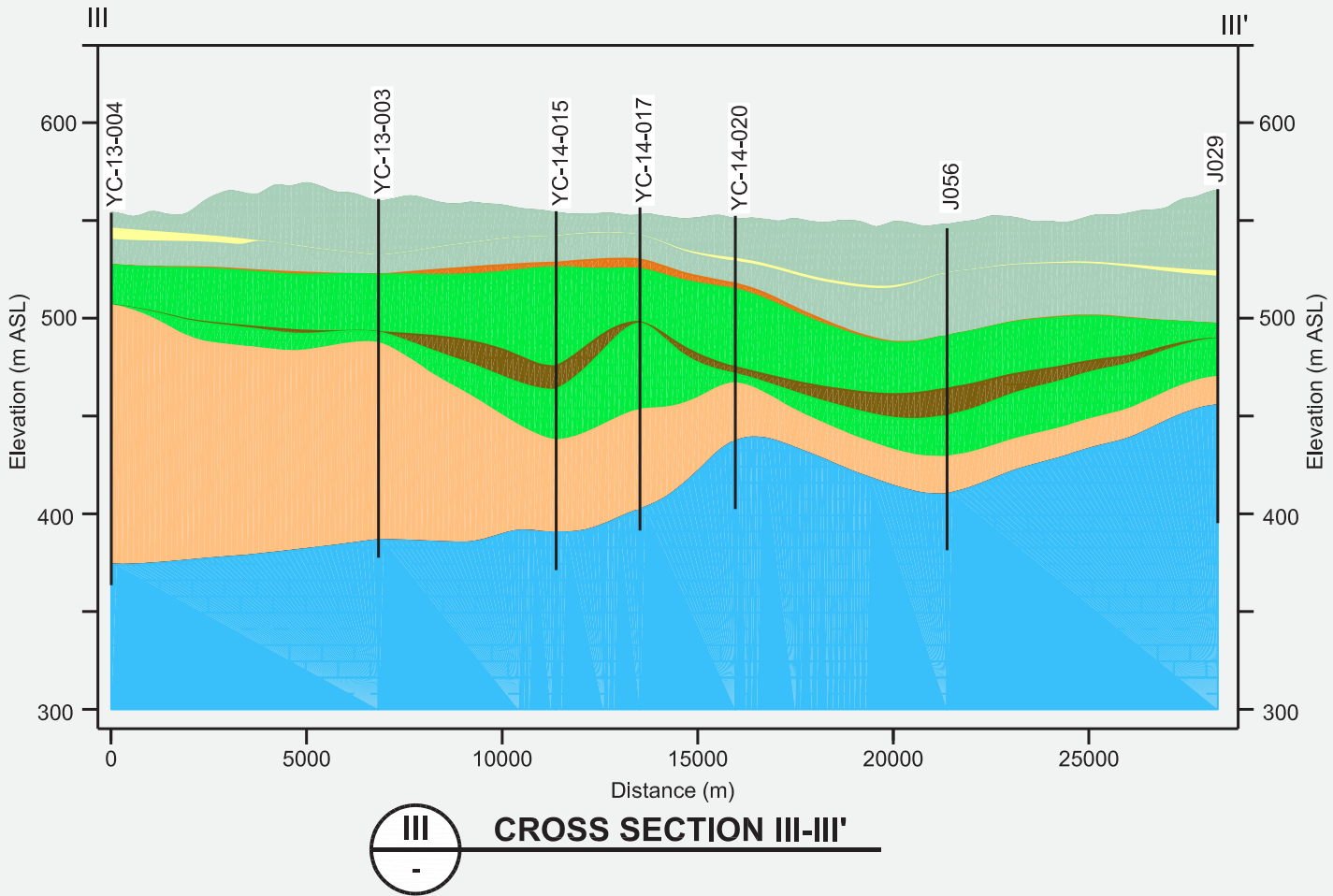
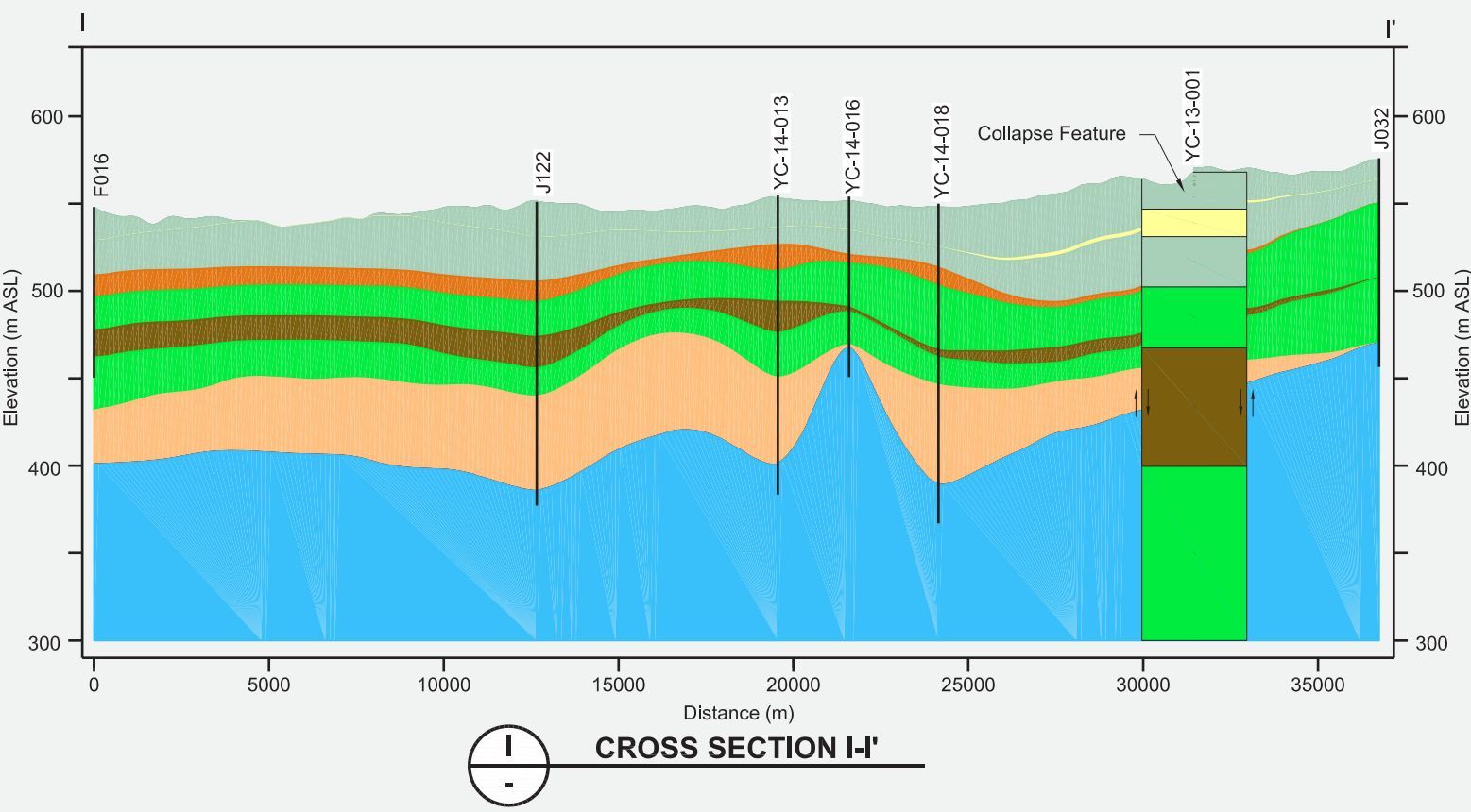




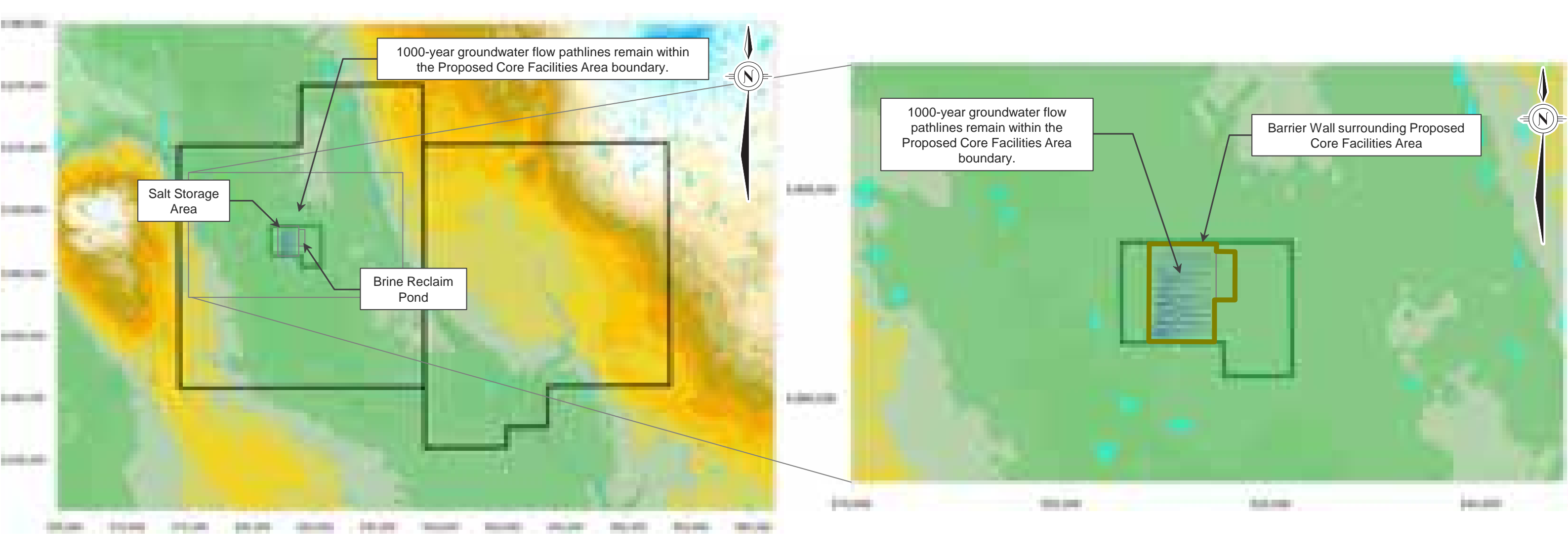
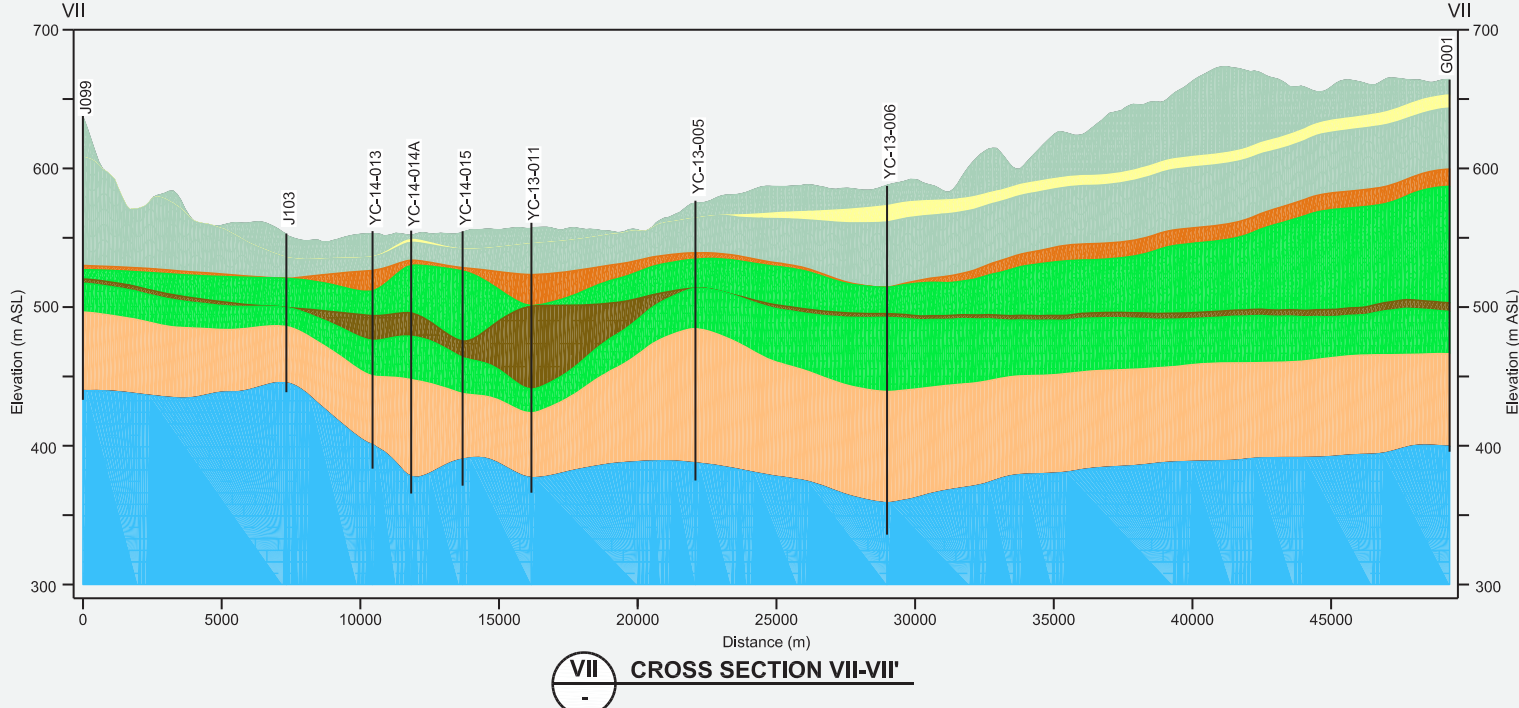
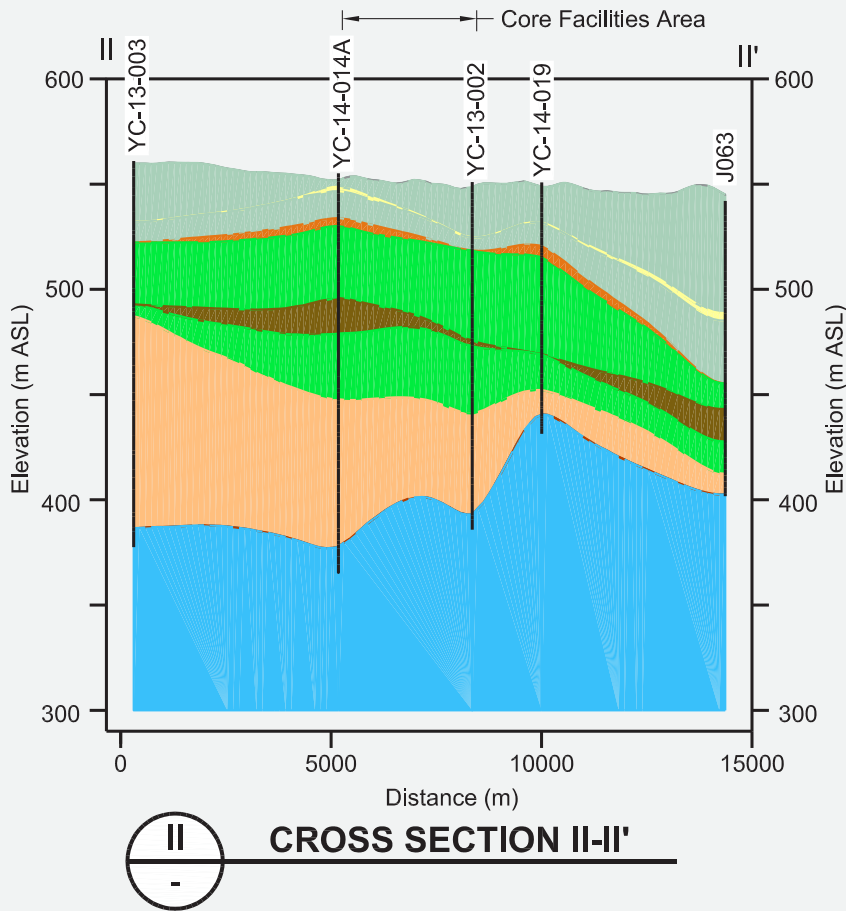
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Hydrogeology



- LEGEND
- BOREHOLE LOCATION
- STRATIGRAPHIC COLOUR LEGEND
- ALLUVIUM
  - SASKATOON GROUP TILL
  - SASKATOON GROUP AQUIFER
  - INTERTILL AQUIFER
  - SUTHERLAND GROUP TILL
  - SUTHERLAND GROUP AQUIFER
  - EMPRESS GROUP
  - BEARPAW FORMATION



- LEGEND
- PARTICLE PATHLINE
  - SURFACE WATERCOURSE/WATERBODY
  - BARRIER WALL
  - PERMIT BOUNDARY
  - CORE FACILITIES AREA



# Hydrology

## **What was assessed:**

- Spatial distribution of water including the spatial extent and location of waterbodies, runoff pathways, and streams;
- Temporal distribution of water including changes in water levels and flows through time;
- Drainage boundaries; and
- Stream channel gradients.

## **Results:**

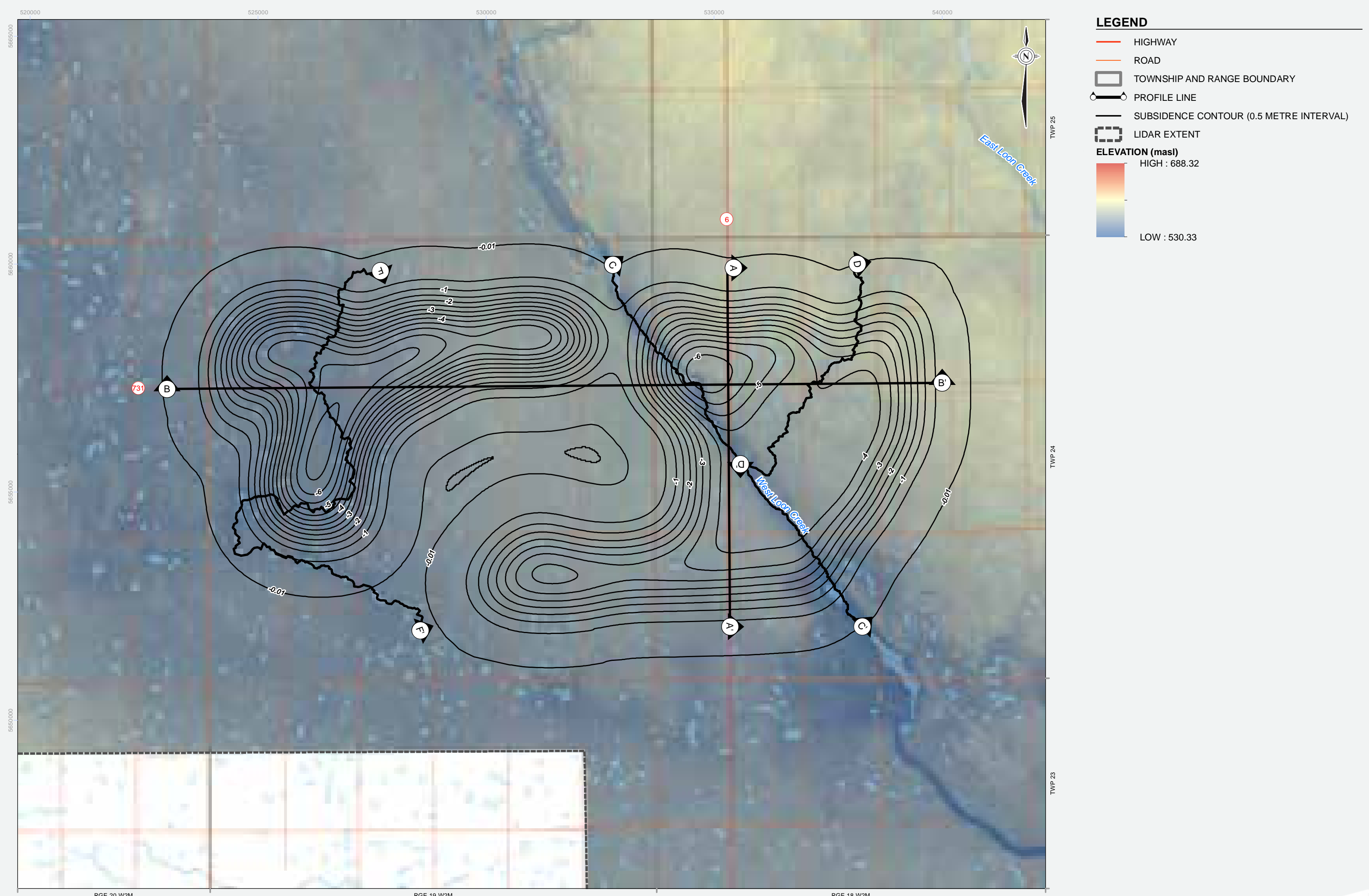
- Ground subsidence due to solution mining will occur overlying the mine well field.
- Maximum subsidence is calculated to be approximately 6 metres in some locations; however, maximum subsidence will not occur for more than a century.
- Subsidence will be monitored on a regular basis over the period of operation and following Project decommissioning and reclamation.
- The isolation of the core facilities area (and the well pads) from the surrounding local drainages will slightly reduce runoff and irreversibly change drainage patterns in the immediate area.

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# Hydrology

## Results Continued:

- The effects in annual runoff volume was estimated to be about a 2.3% decrease of the runoff reporting to the low-topography area within the West Tributary sub-basin of West Loon Creek, and negligible for West Loon Creek during the operations phase.
- The Project is not expected to affect the continued availability of surface water quantity for human use and ecosystems.





# Surface Water Quality

## What was assessed:

- Surface water quality (i.e., physical analytes, chemical properties)
- Although there are no lakes present in the water quality effects study area, there are numerous ephemeral wetlands present.
- Water quality samples were collected during the spring, summer, and fall of 2013.



## Results:

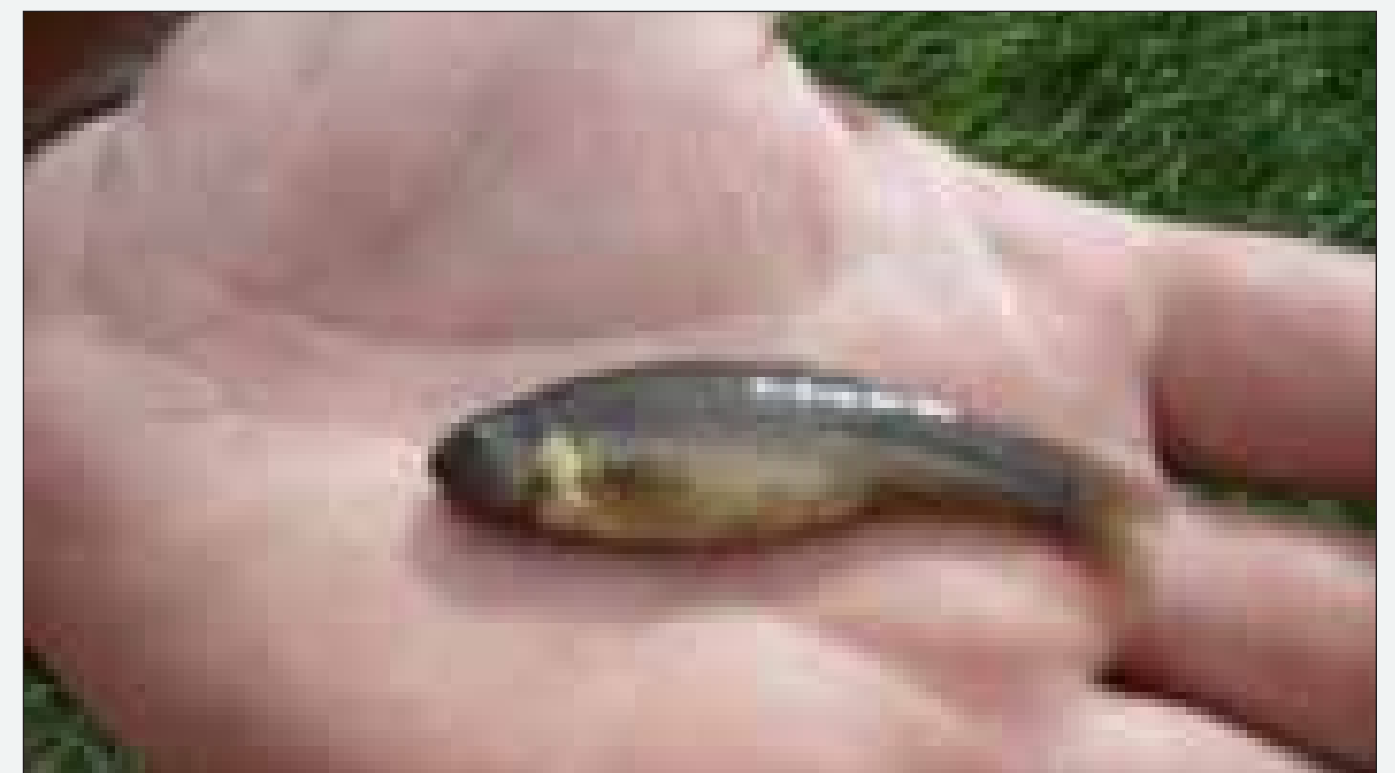
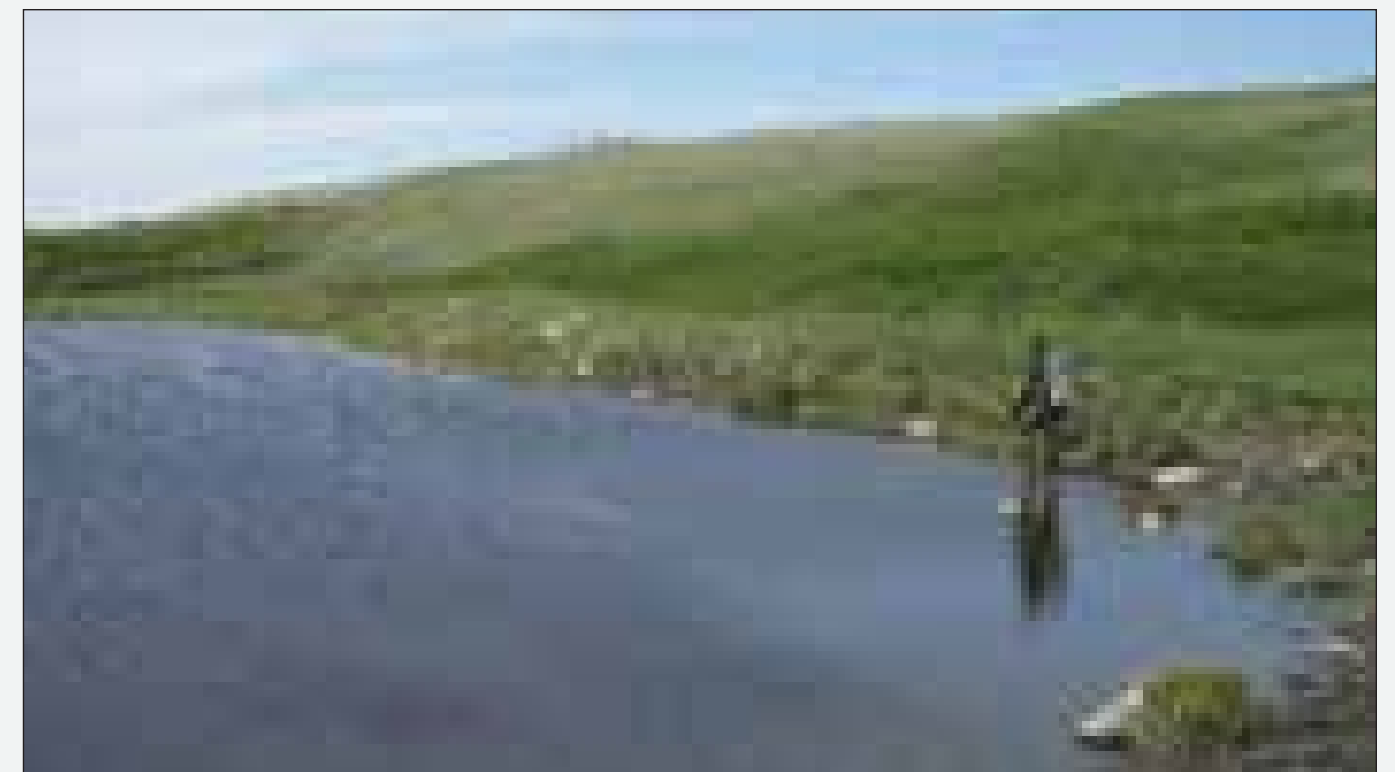
- Total predicted surface water concentrations of potassium and chloride are expected to be within the natural range of variability for West Loon, East Loon, and Loon creeks (e.g., a few mg/L). It is therefore considered unlikely that deposition of potassium and chloride will adversely affect surface water quality
- The Project is not expected to affect the continued suitability of surface water for human use.



# Fish and Fish Habitat

## What was assessed:

- Fish habitat quantity and fragmentation
- Fish habitat quality
- Abundance and distribution of fish species
- Fish inventory surveys were completed in West Loon Creek, East Loon Creek, Loon Creek, and three disconnected land-locked waterbodies during the spring, summer, and fall of 2013.



## Results:

- Brook Stickleback and Fathead Minnows were the only fish species captured or observed.
- No large-bodied fish species were captured.
- Changes to fish and fish habitat from ground subsidence will occur gradually and maximum subsidence will not occur for more than a century.
- West Loon Creek will continue to support small-bodied fish.
- The residual effects from the Project are not likely to contribute to significant effects on self-sustaining and ecologically effective fish populations.

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Southey Project

# Soils

## What was assessed:

- Soil quality (i.e., physical, biological, and chemical properties)
- Soil quantity and distribution

## Results:

- Two most dominant agricultural capability classes are Class 3 (48.9%), moderately severe limitations that restrict the range of crops or require special conservation practices, and Class 2 (20.7 %), moderate limitations that restrict the range of crops or require special conservation practices.
  - Most common limitation is moisture
- The Project footprint, with the exception of the TMA will be reclaimed to an equivalent agriculture capability during decommissioning and reclamation.
- The Project is not expected to affect the capability of soil to support agriculture and other plant communities.



# Vegetation

## What was assessed:

- Quantity, arrangement, and connectivity (fragmentation) of plant communities
- Abundance and distribution of habitat for listed plant species
- Abundance and distribution of habitat for traditional use plant species
- Presence of weed and invasive plant species



## Results:

- Dominant land cover is cultivated (58%).
- Modified grassland covers 16%, wetlands 13% and native grassland 8%.
- Majority of the patches of Native Grassland associated with the Project footprint are 0.6 hectares and smaller.
- Removal of vegetation by the Project should not disrupt the existing connectivity of native grassland, wetlands, and wooded vegetation types.
- The Project is not expected to affect the ability of plant communities, listed plants, and traditional use plants to be self-sustaining and ecologically effective.



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# Wildlife

## What was assessed:

- Habitat quantity, arrangement, and connectivity (fragmentation)
- Habitat quality
- Survival and reproduction
- Abundance and distribution of wildlife such as:
  - White-tailed Deer
  - Elk
  - Upland Birds
  - Ferruginous Hawk
  - Waterbirds
  - Short-eared Owl
  - Northern Leopard Frog



## Results:

- Cumulative changes from sustained agricultural practices over the last 100 years have likely resulted in adverse effects on some wildlife populations in the effects study area.
- Most of the habitat types expected to be affected by the Project are widely distributed in the effects study area, including native grassland and wetland habitats; subsequently the Project should have little influence on grassland and wetland wildlife.
- The Project is not expected to affect the ability of wildlife to be self-sustaining and ecologically effective.



# Yancoal Canada Resources Company Limited Southey Project

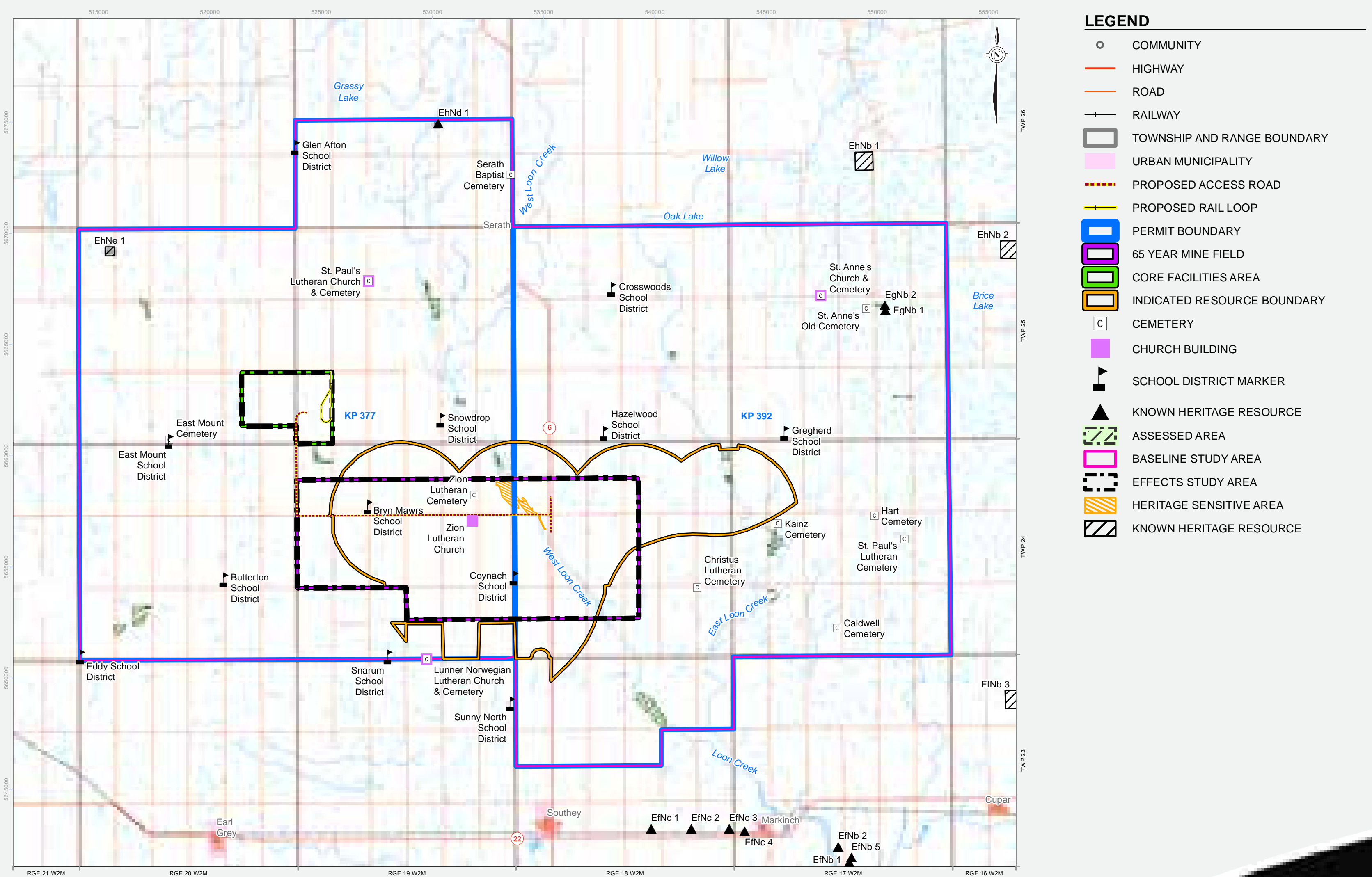
## Heritage Resources

### What was assessed:

- Archaeological and sacred sites

### Results:

- No known heritage resources are located within the core facilities area, and the land is not considered heritage sensitive by the Saskatchewan Ministry of Parks, Culture and Sport-Heritage Conservation Branch.
- The Project is not predicted to affect heritage resources.



# Socio-Economic Environment

## **What was assessed:**

- Employment
- Labour income
- Tax revenue
- Gross domestic product
- Project workforce requirements
- Potential changes in the demand for housing, accommodations, social, health, emergency and protective services, and physical infrastructure
- Commitments regarding employment training
- Project traffic volumes
- Commitments regarding safety measures and reducing traffic
- Changes in land use
- Changes in visual aesthetics
- Changes in noise levels and air quality
- Changes in water quality and quantity



# Socio-Economic Environment

## Results:

### • Employment and Economy

- An employment strategy will be developed once a decision has been made to proceed with the project.
- Skilled local workers will be given priority, however, the Project is expected to require some out of province work force.
- During construction there will be high demand for trades people and labourers such as:
  - Carpenters,
  - Electricians,
  - Welders,
  - Concrete workers,
  - Equipment operators,
  - Pipe fitters, and
  - Sheet metal workers.
- During operation the types of positions required will include:
  - Millwrights,
  - Process engineers,
  - Electricians,
  - Mechanics,
  - Drillers,
  - Safety, health and environment personnel and
  - Other trades.
- Project spending will result in increased Gross Domestic Product and Project operations will generate tax revenue for municipal, provincial and federal governments.

# Socio-Economic Environment

## Results Continued:

### • Community Services and Infrastructure

- The Project workforce will result in an increased population in the local area which will result in an effect on housing, schools and health care facilities that are operating near or at capacity.
- Most of these residual effects are expected to occur in Regina. The City of Regina and service providers are aware of the rapid increase in population and corresponding demand for services and infrastructure and are planning accordingly for the future.

### • Traffic and Transportation

- Traffic is expected to increase north of Regina on Project access routes.
- A traffic impact assessment was completed and identified required road upgrades and mitigation to reduce the residual effects on traffic and transportation.
- Yancoal will work with the rural municipalities and governments to facilitate local traffic movement around the core facilities area.

# Socio-Economic Environment

## Results Continued:

### • Quality of Life

- Air modelling indicated that emissions will be within guideline values.
- Water assessment determined that there would be no significant residual effects on water quality.
- Noise levels were predicted to be within guideline values at all noise receptors except one.
- Visual aesthetics will be altered for some farmyards, and residences.
- Available agricultural land will be reduced.
- No known traditional land use exists within the Project footprint.

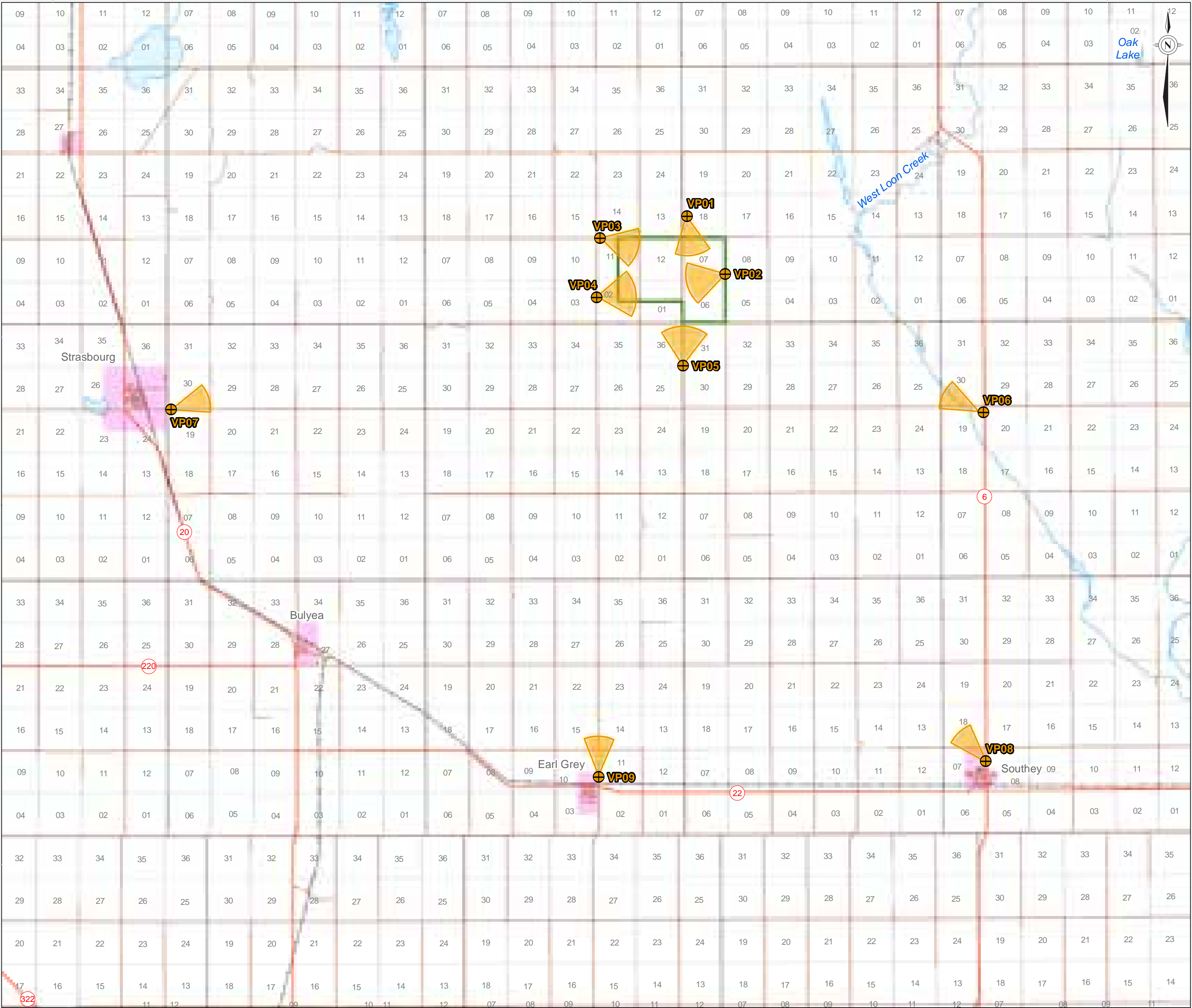




Yancoal Canada Resources Company Limited

Southey Project

Visual Aesthetics



- LEGEND**
- COMMUNITY
  - HIGHWAY
  - ROAD
  - RAILWAY
  - TOWNSHIP AND RANGE BOUNDARY
  - URBAN MUNICIPALITY
  - SECTION BOUNDARY
  - CORE FACILITIES AREA
  - FIELD OF VIEW

# Visual Aesthetics

VP1

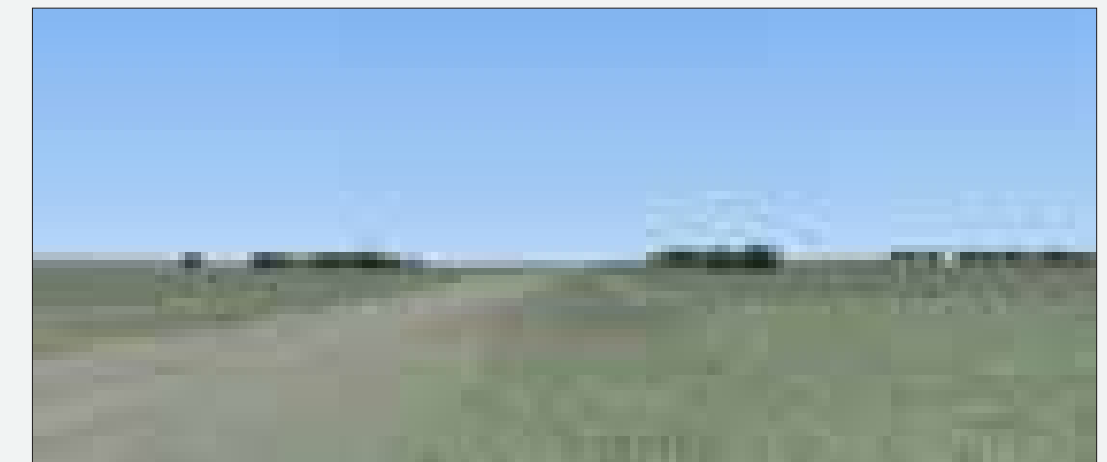
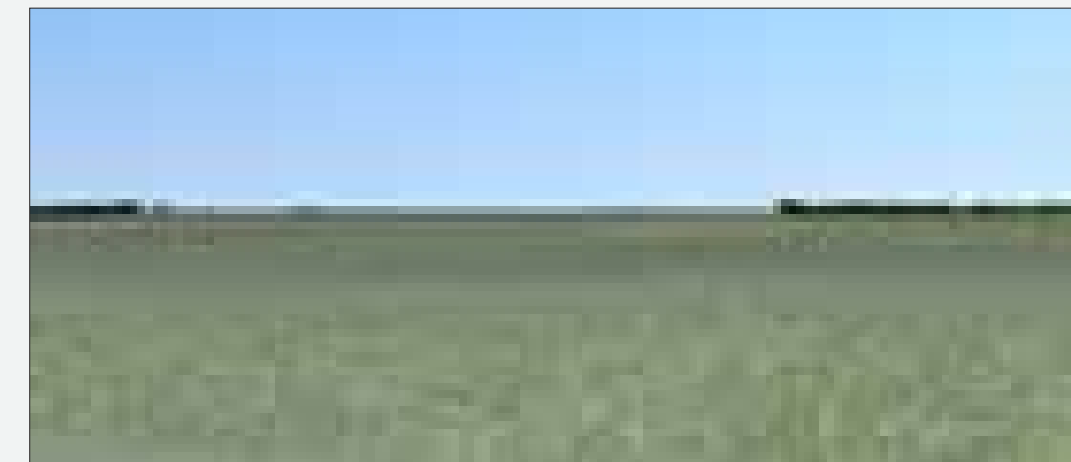
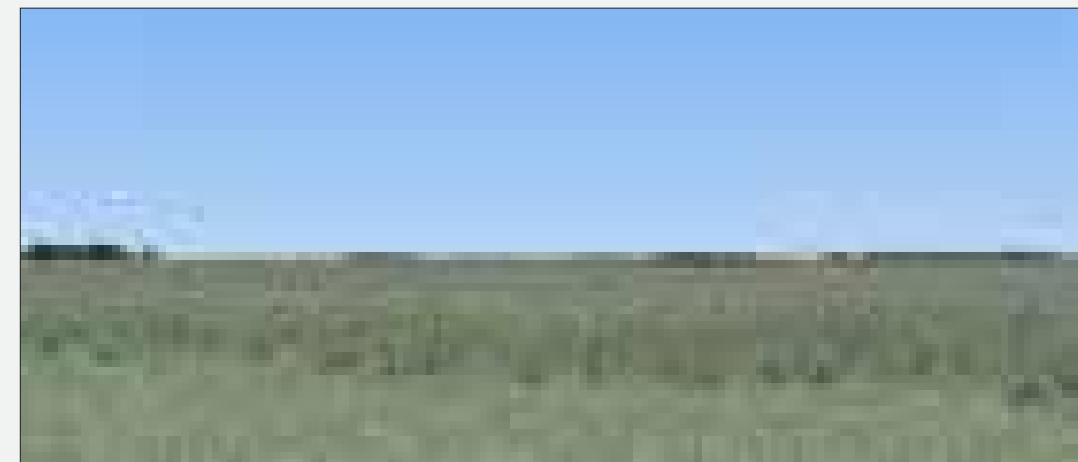
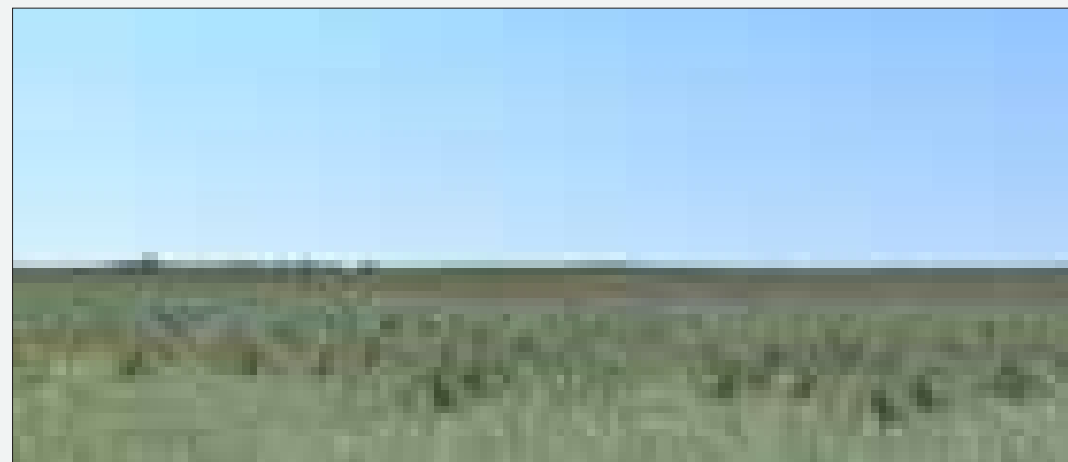
VP2

VP3

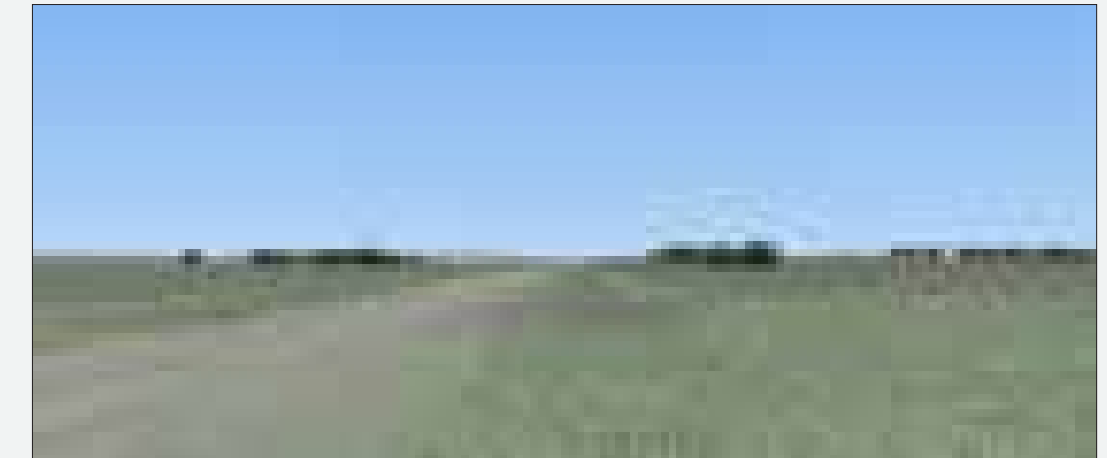
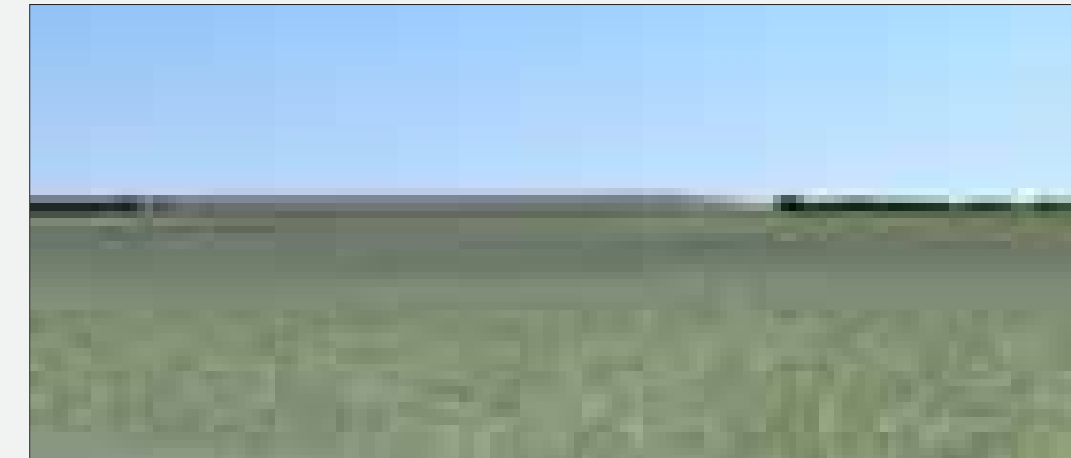
VP4

VP5

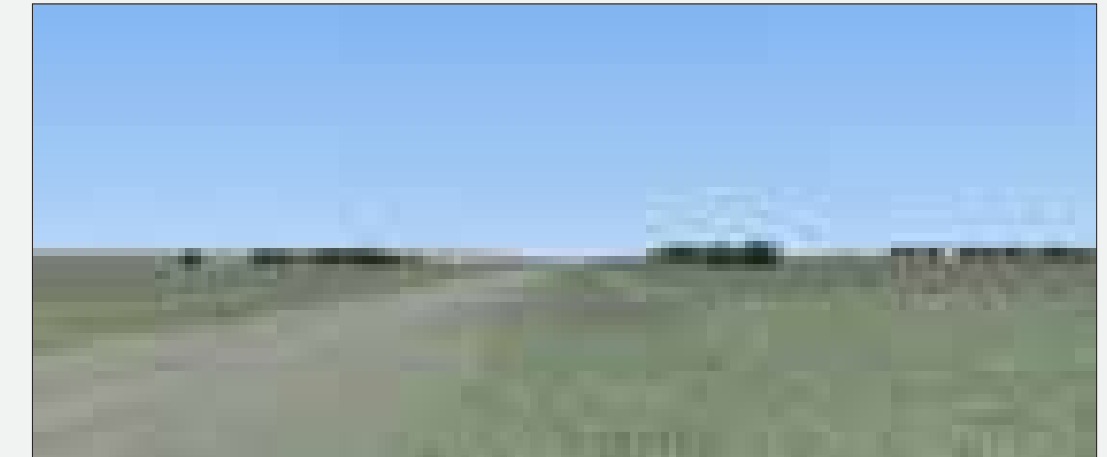
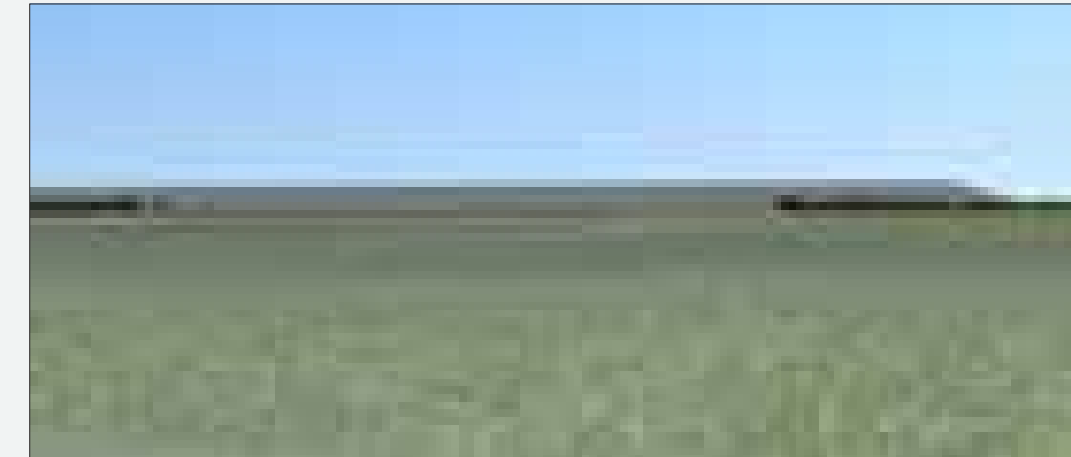
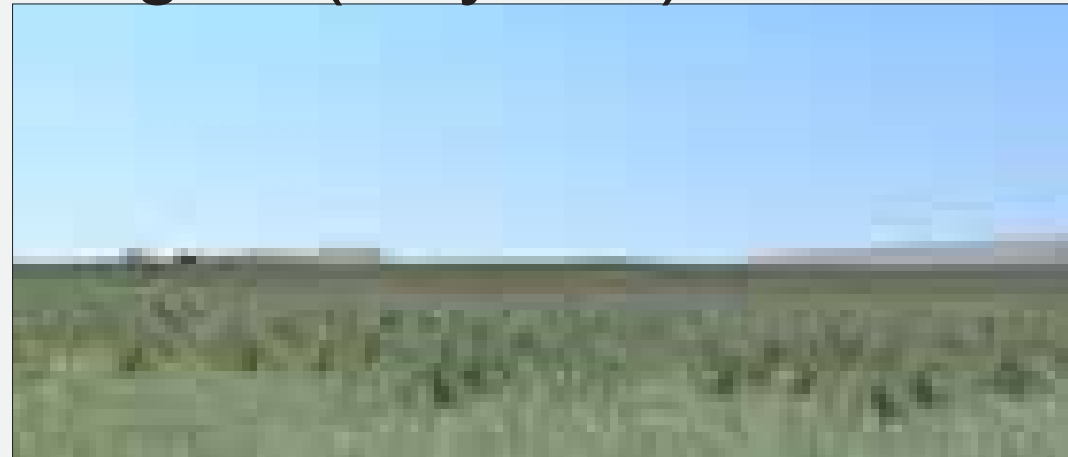
Baseline



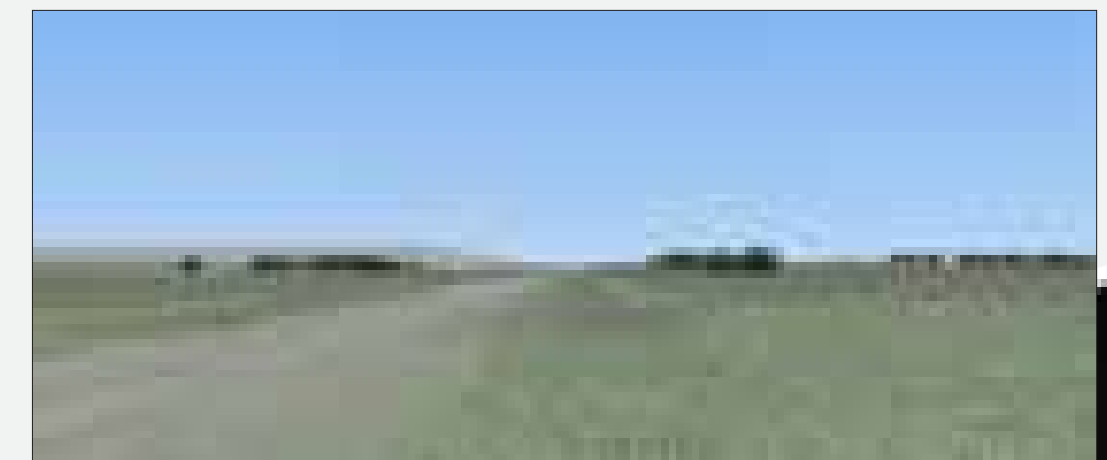
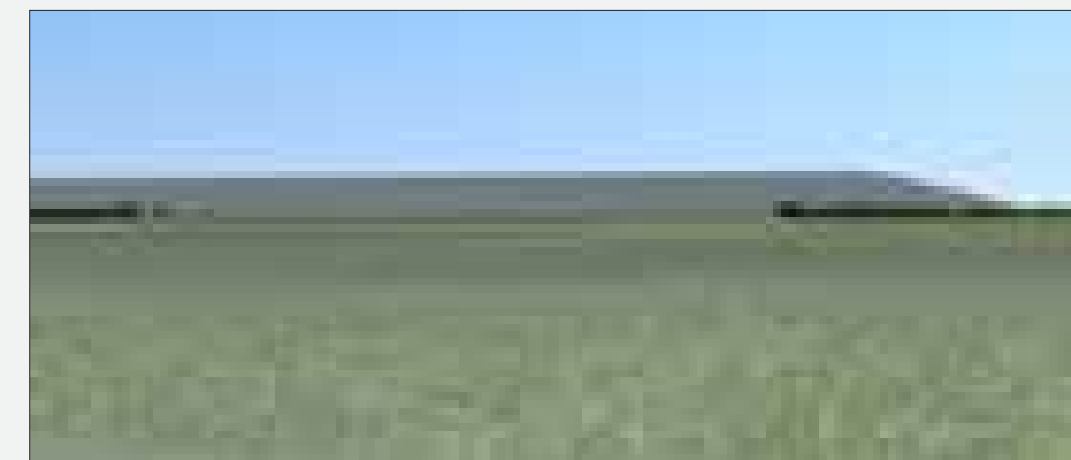
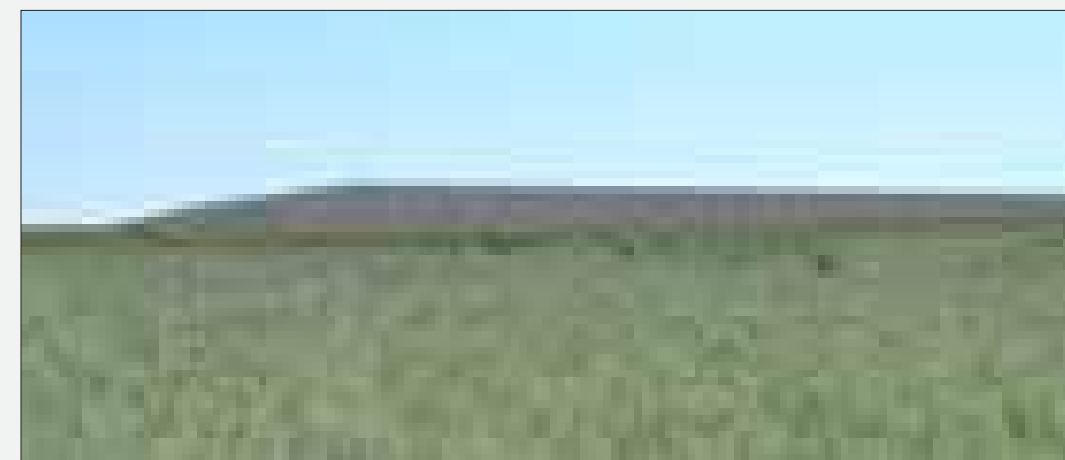
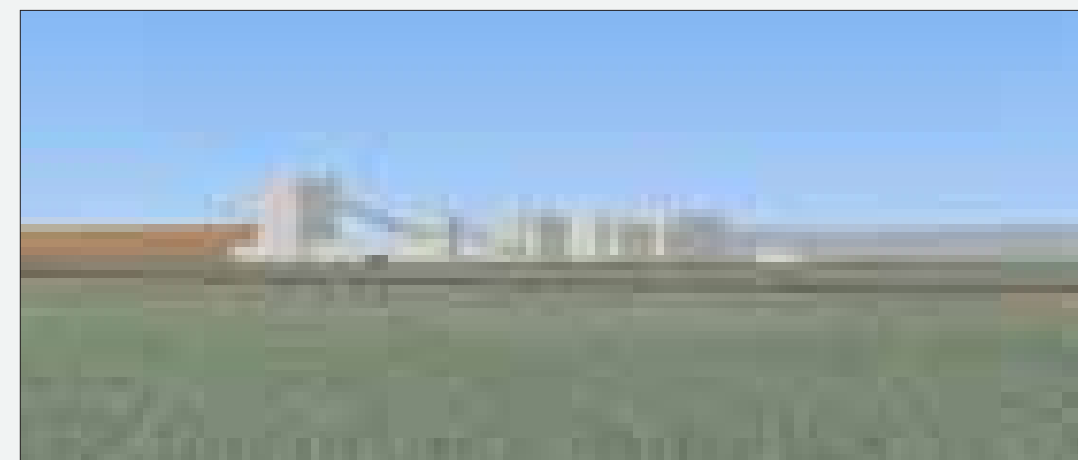
Stage 1 (20 years)



Stage 2 (40 years)



Stage 3 (100 years)



# Visual Aesthetics

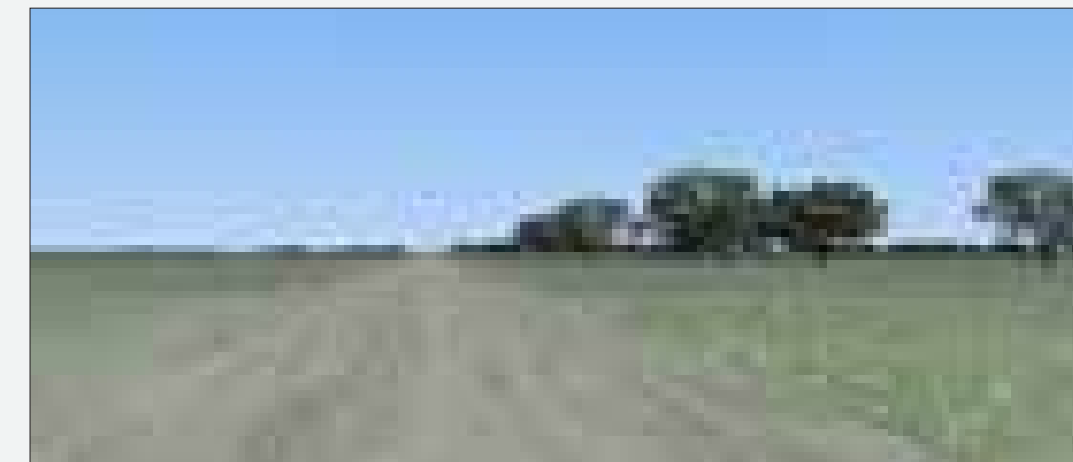
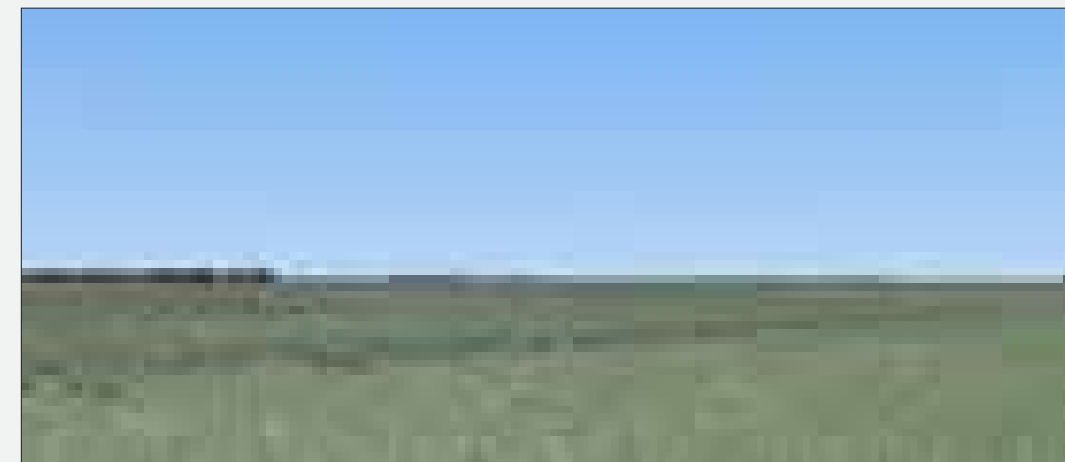
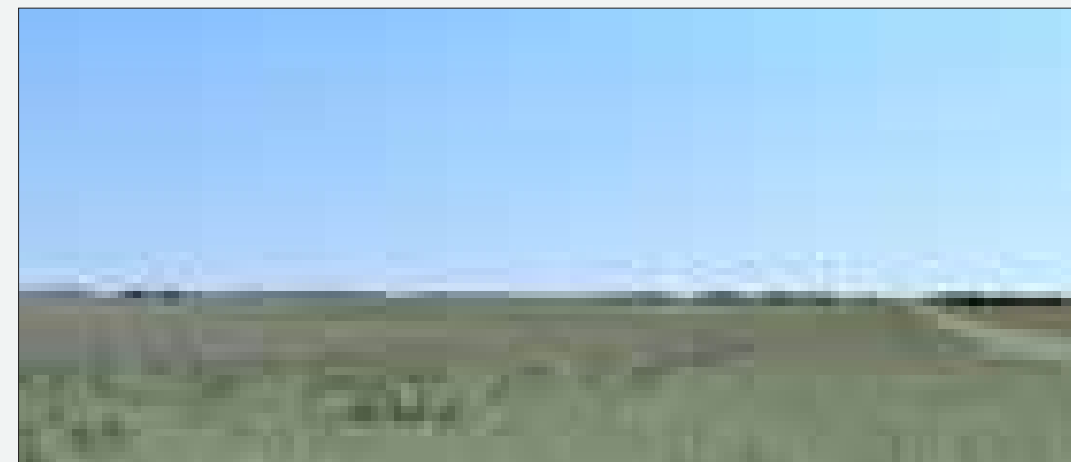
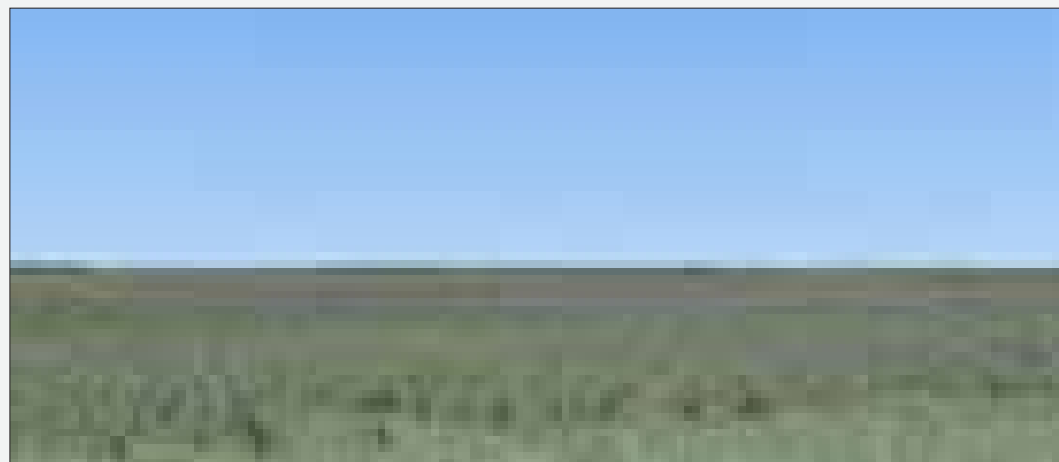
VP6

VP7

VP8

VP9

Baseline



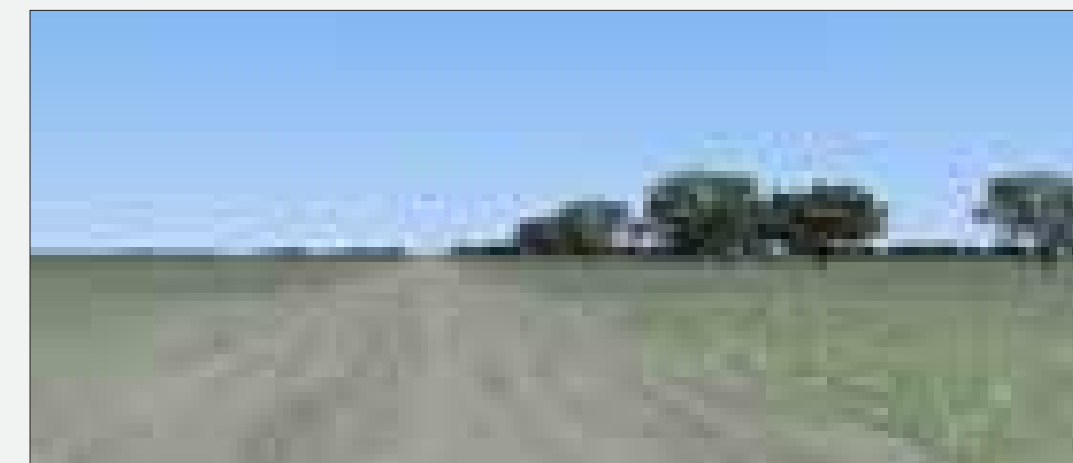
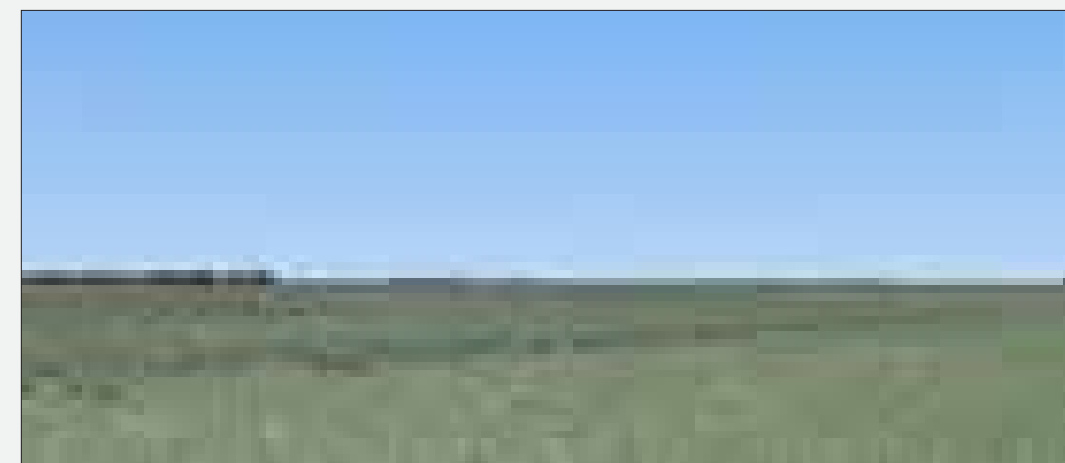
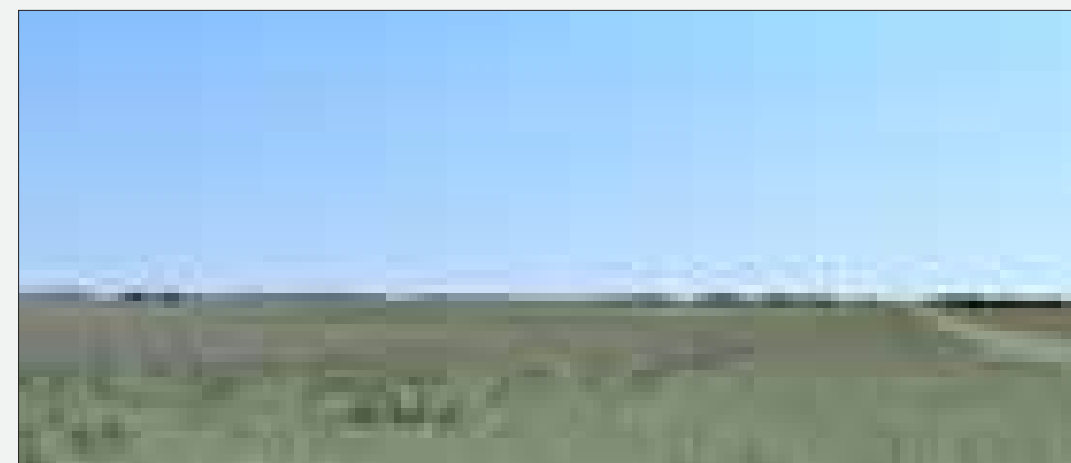
Stage 1 (20 years)



Stage 2 (40 years)



Stage 3 (100 years)





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# Engagement

- Engagement and community involvement is an important part of the Environmental Assessment and permitting process.
- Yancoal will continue to maintain regular communication with the following groups and organizations:
  - Public (rural municipalities, towns, villages, landowners, and other interested members of the public);
  - First Nation and Métis communities; and
  - Governmental and regulatory agencies.
- The intent of these engagement activities are to:
  - Provide information on the Project to potentially affected people and other interested members of the public; and
  - To actively seek comments from the general public and First Nation and Métis communities regarding existing environmental and socio-economic conditions in the local area.



Yancoal Canada Resources Company Limited  
Southey Project



# Contact Information

**For more information about  
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