UPDATE – PROPOSED COAL MINING EFFLUENT REGULATIONS

Technical Information Sessions
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Environment and Climate Change Canada
Environnement et Changement climatique Canada
Canada

Overview

- Current Status
- Regulatory Overview
- Key Provisions for all Mines
- Key Provisions for Mines under the General Approach
- Key Provisions for Mines under the Alternative Approach
- Next Steps
- Open Discussion

A presentation on Environmental Effects Monitoring will follow.

Current Status

- Three rounds of engagement/consultations have occurred:
  - January 2017 – presented initial *Proposed Regulatory Framework for Coal Mining*
  - November 2017 – more detailed *Proposed Approach for Coal Mining Effluent Regulations* presented that considered comments received
  - Fall 2018 – presented update on current thinking on key issues:
    - Signal Check: Proposed Coal Mining Effluent Regulations
    - CMER EEM – Key areas considered for change from Nov. 2017 consultation document
- Written comments received have been considered in refining the proposed approach
- Purpose of this presentation is to provide information on the regulatory proposal and on the next steps

Regulatory Overview

- Two-pronged approach:
  1. **General approach** for mines with effluent discharged through Final Discharge Points (FDPs)
  2. **Alternative approach** only for existing mountain mines in the Elk Valley, British Columbia
     - Mines with effluent from FDPs and non-point sources (diffuse)

Change:

- Alternative approach would only apply to existing mountain mines in the Elk Valley, BC
- Objective for alternative approach was for it to apply where significant and long-standing practices has created legacy issues where it is not practical to collect all effluent, and where significant long-term impacts to the aquatic environment have occurred – these conditions only exist in the Elk Valley, BC
- Other existing mountain mines would be subject to the general approach

Key Provisions for All Mines

Application

- Regulations would apply to any coal mine that deposits effluent to water frequented by fish
- Would exclude:
  - Exploration projects
    - under 100,000 tonnes of coal production for testing purposes only
  - Mines that ceased coal production prior to January 1, 2012, unless they resume operations

Change:

- Removed the 50 m^3/day threshold – allows for any operating coal mines that deposits (discharges) effluent to be captured regardless of size
- Would include mines under care and maintenance since 2012 – these mines may re-open and discharge effluent

Authority to deposit deleterious substances

- Three substances would be prescribed as deleterious substances:
  - Selenium
  - Nitrate
  - Suspended Solids
- Effluent quality standards would apply to these substances
- Effluent must also be not acutely lethal

Mine Waste Disposal Areas

Change:

- Provisions will not be included for an authorization to deposit a deleterious substance into water frequented by fish for a coal mine waste disposal area (tailings impoundment area).

- Coal mines are not analogous to metal or diamond mines where water frequented by fish is used as a tailings impoundment area for the confined deposit of mine waste and tailings to prevent oxidization. ECCC is not aware of any coal mine that is planning the subaqueous storage of mine waste.

- Authorization will still be required from the Minister of Fisheries and Oceans Canada under Section 35 of the *Fisheries Act* for any coal mining related work, undertaking or activity that results in the harmful alteration, disruption or destruction of fish habitat.

Analytical Requirements

- Suspended solids, selenium and nitrate concentrations would need to be determined by a laboratory accredited
  - under the International Organization for Standardization standard ISO/IEC 17025, or
  - under the *Environment Quality Act*, CQLR, c. Q-2; and

Public Information and Review of Regulations

- Any information submitted under these regulations could be made public

Review of Regulations

ECCC intends to review the Regulations 10 years after promulgation. In reviewing the Regulations, ECCC will consider factors such as EEM results, effluent monitoring data and advancements in mitigation measures to assess the effectiveness and appropriateness of compliance limits, particularly selenium limits under the alternative approach.

Key Provisions under the General Approach

Application

- The General Approach would apply to coal mines other than existing mountain mines located in the Elk Valley, BC
- Excludes recognized reclaimed areas of coal mines

Effluent Quality Standards

- Starting 3 years after promulgation, deposits from final discharge points (FDP) would be authorized if effluent:
  - meets limits for selenium, nitrate and suspended solids;
  - is not acutely lethal; and
  - is within a pH range of 6-9.5
- Different limits for « new » mines and « existing » mines would apply
  - New mines include:
    - mines that first start operating 3 years after promulgation of the regulations, and
    - mines that ceased operating prior to January 1, 2012, and re-open after the three-year window
- Mines would be prohibited from diluting effluent prior to deposit through an FDP
  - can’t combine non-contact or diverted water with effluent resulting in diluting effluent prior to deposit through FDP

Effluent Quality Standards cont'd

- Limits and requirements with respect to pH and acute lethality would take effect 3 years after promulgation, when mines would gain the authority to deposit

Deleterious Substance	Unit	Existing Mines		New Mines	
		Maximum Monthly Mean Concentration	Maximum Grab Sample Concentration	Maximum Monthly Mean Concentration	Maximum Grab Sample Concentration
Suspended Solids	mg/L	≤ 35	≤ 70	≤ 35	≤ 70
Total Selenium	µg/L	≤ 10	≤ 20	≤ 5	≤ 10
Total Nitrate	mg/L, as nitrogen	≤ 10	≤ 20	≤ 5	≤ 10

Suspended Solids Exception

- Grab sample limits for SS would increase to 2000 mg/L during and within 24 hours after an exceptional precipitation event
- An exceptional precipitation event is:
  - For existing mines: a 1-in-10-year, 24-hour precipitation event
  - For new mines: a 1-in-25-year, 24-hour precipitation event
- To determine if an event is exceptional, the amount of rainfall would need to be measured using an on-site precipitation gauge and compared to ECCC's Intensity-Duration-Frequency (IDF) data from the closest station
  - ECCC publishes tables and graphs for short-duration rainfall IDF statistics across Canada: https://climate.weather.gc.ca/prods_servs/engineering_e.html

Changes:

- Limit of 2000 mg/L would apply during an exceptional event
- More stringent trigger (1-in-25 year) would apply for new mines
- Exception is limited to 24 hours after the event

Monitoring Requirements

- For the first three years, quarterly sampling and testing for selenium, nitrate and SS would be required – as part of effluent characterization for Environmental Effects Monitoring
- Frequencies would be as follows thereafter:

Parameter	Minimum Frequency
Selenium and Nitrate	Weekly - quarterly if 10% below limit for 12 consecutive months, additionally, in the case of nitrate, explosive cannot have been used in the preceding 12 months
SS	Weekly
pH	Weekly
Acute Lethality on Fish and Invertebrate Species*	Monthly - If failed, conduct effluent characterization and test twice a month until 3 consecutive passes - If passed for 12 consecutive months, reduced to quarterly
Flow rate	Weekly or continuously

*Effluent from mines would need to be non-acutely lethal to rainbow trout and *Daphnia magna.* For mines discharging saline effluent to marine environment, the use of Three-spined stickle back in place of rainbow trout and *Acartia tonsa* in place of *Daphnia magna*

Special Provisions for No-Production and Low Flow (<50 m^3/day) Mines

- If a mine ceases coal production or had an annual average daily volume of effluent less than 50 m^3 in the previous calendar year, minimum testing frequency would be reduced to quarterly for all parameters
- Quarterly mean limits for deleterious substances that are equal to the monthly mean limits would apply
- Increased frequency provisions would continue to apply in the case of acute lethality

Change:

- Intent is to reduce administrative burden in the case where effluent is expected to be relatively constant (mines on care and maintenance) and where mines have low flows (expected to be small mines).

Reporting Requirements

- Identifying information (within 60 days of promulgation) including:
  - Company and contact person information
  - Mine description including planned new areas, locations of fish-frequented waters, descriptions of treatment systems
  - Whether coal mine is producing coal or not
- Information with respect to FDPs (within 60 days of promulgation) including:
  - FDP name, description and location
  - Name and description of the receiving waterbody
  - Description of area of the mine that generates effluent deposited through the FDP
- Quarterly reports of all tests and monitoring conducted under the CMER in the preceding quarter
  - First quarterly report would need to be provided 45 days at the end of the first quarter after promulgation

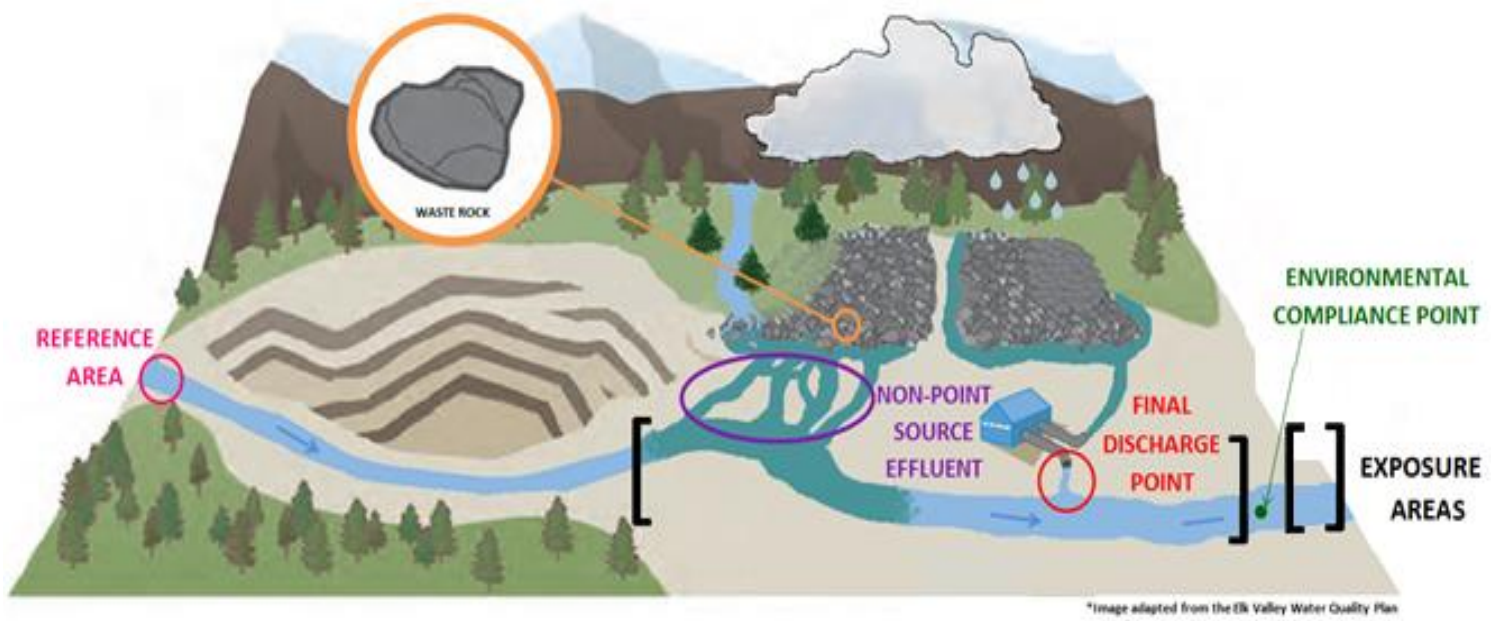
Recognized Reclaimed Areas

- The owner of a mine under the general approach could apply to have a mine or an area of a mine recognized as reclaimed by the Minister of the Environment
- Once the mine or area of the mine is recognized as reclaimed, it would lose its authority to deposit and would no longer be required to be monitored and reported on

Recognized Reclaimed Areas cont'd

- Criteria to be recognized as reclaimed would include:
  - Coal production and storage ceased at least 6 years prior to the application
  - Effluent from other parts of the mine does not contact the area
  - All provincial/territorial/federal requirements for establishing the area as reclaimed have been met
  - Reclamation activities to prevent the weathering and mobilization of deleterious substances within the area were completed at least 3 years prior to application
  - Effluent quality standards at FDPs within the area were met for 3 consecutive years prior to the application, where applicable
  - If applicable, has conducted an EEM biological monitoring study

Key Provisions under the Alternative Approach



Note that Environmental Effects Monitoring (EEM) would need to be conducted on two exposure areas, one upstream of each ECP and one downstream – to be discussed further in EEM presentation.

Alternative Approach: Overview

- Would apply to five existing mountain mines in the Elk Valley in southeastern BC
- Would require that effluent from existing areas currently discharged through FDPs:
  - Continue to be discharged through FDPs, i.e., keep collecting the effluent already collected
  - Monitor for selenium, nitrate, SS and flow
  - Meet SS limits, pH and acute lethality requirements (same as under general approach)
- Would set receiver-based limits for Nitrate, Selenium, and SS at Environmental Compliance Points (ECPs)
- Expansions would be required to collect effluent and deposit through an FDP. Limits for existing mines under the general approach would apply.
- Non-point source effluent would not be authorized to be deposited downstream of ECPs
- Authority to deposit would take effect 3 years after promulgation, at the same time as effluent quality standards at FDPs and ECPs

Change: Re-introduction of SS limits at ECPs relative to background point measurements.

Proposed Criteria for Locating Environmental Compliance Points

- The combination of all of a mine's ECPs would need to account for all effluent from a mine in each designated waterbody into which the mine discharges
  - Proposed designated waterbodies are the Fording River, the Elk River, Michel Creek and Harmer Creek
- An ECP would need to be within 200 m downstream from the mine's last effluent entry point into the designated waterbody (FPD or non-point source)
- ECP locations would need to allow for year-round sampling and flow measurement
- Mines depositing in the same area of a designated water body could establish joint ECPs with shared liability

Criteria adjusted to reflect the current proposal to limit the alternative approach to the Elk Valley.

Background Points

- A Background Point would need to be established for each ECP
- Location would need to:
  - be within 200 m upstream of where effluent from a mine associated with the ECP is deposited in the designated waterbody
  - allow for year-round sampling and flow measurement
- Would establish selenium, nitrate and SS concentration and pH measurements prior to a mine depositing effluent
- SS limits at ECPs would be determined relative to background point measurements

Application for ECPs and Background Points cont'd

- The owner of a mine would be required to submit to the Minister of the Environment proposed ECP and Background Point locations and supporting information within 4 months of the coming into force of the regulations
- If all criteria in the application are met, a notice of acceptance would be issued within 1 year of promulgation

Application for ECPs and Background Points

- Application for ECPs and background points would include:
  - Mine identifying information
  - Details of each proposed ECP including name, location, details of how the ECP meets the criteria, description of effluent sources, pathways and deposit locations, etc.
  - Details of each proposed background point including name, associated ECP, location, description, receiving waterbody, etc.
  - Information on all existing monitoring sites for which information is reported to the province
- Information must be prepared and signed by qualified professionals and certified by the owner or operator

Determining Baseline Performance at ECPs

- Baseline performance for selenium and nitrate concentrations would be determined during years 2 and 3 after promulgation
- Weekly concentration measurements would be gathered to determine monthly and 24-month means
- Limits for selenium and nitrate would be based on the 24-month mean performance during the baseline period

Phase-in of Standards at ECPs

- Beginning 3 years following promulgation, the following effluent quality standards would have to be met at each ECP

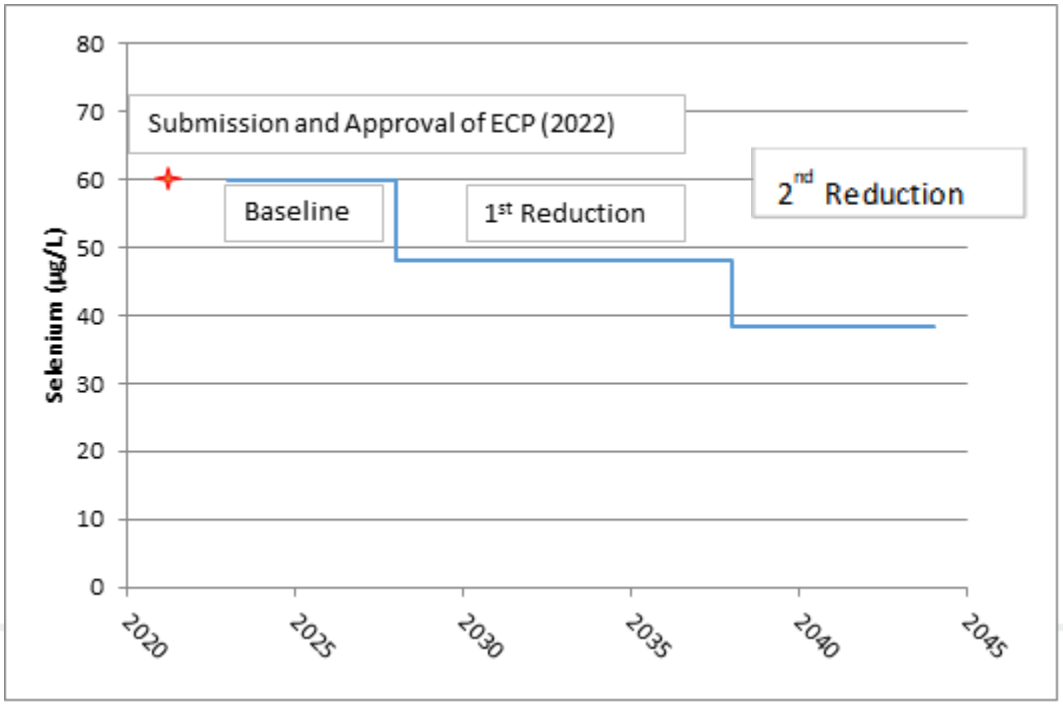
Deleterious Substance	Basis	Limit - Starting 3 years after promulgation	Limit - Starting 6 years after promulgation	Limit - Starting 16 years after promulgation
SS	Grab sample	≤25 % above background levels	≤10 % above background levels	≤10% above background levels
Selenium*	Monthly Average	Highest monthly mean measured during baseline	Lower of 50 µg/L or 20% reduction from baseline	Lower of 40 µg/L or 36% reduction from baseline
	Maximum (grab sample)	Twice the monthly mean	Twice the monthly average	Twice the monthly mean limit
Nitrate, measured as N*	Monthly Average	Highest monthly mean measured during baseline	Lower of 16 mg-N/L or 20% reduction from baseline	Lower of 12.8 mg/L or 36% reduction from baseline
	Maximum (grab sample)	Twice the monthly mean limit	Twice the monthly mean limit	Twice the monthly mean limit
pH	pH at each ECP must be equal to or greater than 6.5 but less than or equal to 9 at all times			

*Monthly mean for selenium and nitrate concentrations would not be required to go below 2 µg/L and 3 mg-N/L respectively.

Phase-in of Standards (cont'd)

Example of phase-in approach in the case where a mine is currently at 60 µg/L at its ECP, assuming CMER promulgation in 2021:

- 1st reduction / limit: 48.0 µg/L in 2027
- 2nd reduction / limit: 38.4 µg/L in 2037



ECP and Background Point Monitoring

- ECPs and background points would be defined as cross-sectional areas of a waterbody rather than a single point
  - When identifying ECPs and background points, coordinates would be provided for either side of the cross section and would need to be marked
- Samples would need to be taken within 25% of the centre of the width of the waterbody and within a metre of the cross-section
- Flow rates at ECPs and background points would need to be measured beginning one year after promulgation using one of two methods:
  - Measuring flow rate or volume of water passing through the cross-section using a flow measurement system
    - Equipment would need to be calibrated and maintained annually and be accurate to within 15%

  OR
  - Measuring the stage of the waterbody and applying a stage-flow relationship
    - Would need to be accurate to within 5mm and reference to at least 3 benchmarks
    - Equipment would need to be calibrated at least once per year
    - Stage-flow relation would need to be accurate to within 15%
    - Would need to be verified by taking manual flow rate measurements 3 times annually

- ECP no longer a single point – provides flexibility for seasonal changes
- Option for determining flow rate using a stage-flow relation added

ECP and Background Point Monitoring (cont'd)

- Weekly sampling and testing for selenium, nitrate, suspended solids and pH would be required at ECP and background points
  - There would be no reduced frequency provisions
- Background point samples would need to be collected within 4 hours of samples collected at the ECP
- Flow rate would need to be determined weekly at the time the sample is collected or continuously
- Acute lethality test would not be required at the ECP or background point
  - All effluent from the mines would be required to not be acutely lethal but monitoring for acute lethality would only be required at FDPs

Expansions

- The Minister of the Environment would need to be notified 60 days prior to commencing an expansion
  - Description of the expansion including a site plan would need to be provided
- Effluent from expansions would need to:
  - be collected and deposited through an FDP
  - meet standards and monitoring requirements for existing mines under the general approach
- An expansion could become a recognized reclaimed area if it meets the criteria

An **expansion** is intended as new areas of the coal mine associated with new coal processing facilities, new coal storage facilities, new areas used for surface or subsurface extraction, new waste storage facilities – not connected to such existing areas of the mine.

Example:

1) A new waste rock pile would be an expansion
2) Waste rock placed on an existing pile would not be an expansion

Reporting Requirements

- In addition to the reporting requirements under the general approach:
  - Identifying information would identify any planned expansions and the estimated timelines for those expansions
  - FDP information would specify whether an FDP is designed to deposit effluent from an Expansion or if it is located downstream of the last ECP
  - Monitoring reports would include concentration, pH and flow measurements from ECPs and background points

NEXT STEPS

Fall 2020

- Publish proposed regulations in *Canada Gazette*, Part I
- Formal 60-day comment period

Fall 2021

- Target to publish final *Coal Mining Effluent Regulations* in *Canada Gazette*, Part II

ANNEX 1 – EXAMPLE OF ECCC IDF DATA

SPARWOOD BC 1157630

Latitude: 49 45'N Longitude: 114 53'W Elevation/Altitude: 1137 m

Table 2a : Return Period Rainfall Amounts (mm)

Duration/Durée	2 yr/ans	5 yr/ans	**10** yr/ans	**25** yr/ans	50 yr/ans	100 yr/ans	#Years Années
5 min	3.0	4.5	5.6	6.9	7.9	8.8	35
10 min	4.0	6.2	7.7	9.5	10.8	12.2	35
15 min	4.8	7.3	8.9	10.9	12.5	14.0	35
30 min	6.3	9.1	10.9	13.3	15.0	16.8	35
1 h	8.2	11.1	13.0	15.3	17.1	18.9	36
2 h	10.7	13.4	15.1	17.4	19.1	20.7	35
6 h	17.1	22.2	25.5	29.8	32.9	36.0	33
12 h	23.0	33.5	40.5	49.3	55.8	62.3	33
24 h	28.6	40.6	**48.5**	**58.6**	66.0	73.4	35