13-21. CYANIDE CONTAINMENT

Concern:
Different assumptions regarding volume of cyanide used and whether leakage will occur raise concerns about the projects stated ability to contain cyanide

This concern responds to the following SEARs for SSD 5765:

- A description of mitigations and
  - Whether these are best practice and represent a full range of measures
  - Whether they will be effective / key performance indicators
  - Contingency plans for residual risks / monitoring and reporting on environmental performance
- An assessment of the likely impacts of all stages of the development, including any cumulative impacts, taking into consideration any relevant legislation, environmental planning instruments, guidelines, policies, plans and industry codes of practice;
- Part 3: Any interference with an aquifer caused by the development does not exceed the respective water table, water pressure and water quality requirements specified for item 1 in columns 2, 3 and 4 of Table 1 of the *Aquifer Interference Policy 2012* for each relevant water source listed in column 1 of that Table.
- Part 3: impacts to significant water resources or threatened species are minimised to the greatest extent practicable
- Assessment of Lawsons Creek and Price Creek
- Environment Protection Authority 14/05/19: Describe how predicted impacts on surface water, groundwater and aquatic ecosystems will be monitored and assessed over time, including monitoring
- Assessment of likely impacts to aquifers; detailed site water balance, management of excess water and reliability
- DRG, Attachment 2A requires rehabilitation methods including
  e) monitoring for rehabilitation
  i) details of triggering intervention
  k) details of post rehabilitation management
  l)i) assessment of rehabilitation techniques against objectives
  l) ii) assessment of potential acid mine drainage
  l) iii) processes to identify and management geochemical risks throughout mine life
  m) iii) groundwater assessment for final water level in any tailing storage facility void
  o) consideration of controls
- DRE/DPE requires a Water Management Strategy that considers
  - a description of how groundwater and aquatic ecosystems will be monitored, Trigger Action Response Plan and trend identification

DISCUSSION

The EIS states that weak acid dissociable (WAD) cyanide used in processing in the tailings would be less than 7 mg/L (Cardno, 2020, pp. 10-19). The EIS also says that the discharge of cyanide within the tailings would be less than 10 ppm WAD cyanide (R. W. Corkery & Co. Pty. Limited, 2020, pp. 4-334). While these figures differ, WAD cyanide is the appropriate measure of potential toxicity. A compacted clay liner, a bitumen liner on the inner wall of the embankment and a seepage collection system are planned to capture some of the leaking cyanide (Cardno, 2020, pp. 10-20), while some will escape according to Figure A.1 of ATC Williams (2020) (Cardno, 2020, pp. 10-20). The forecast for

leakage appears to contradict the statement in Cardno (2020) Section 1.2.4 where the decommissioning risk assessment assumes prevention of infiltration rainfall to the TSF (Cardno, 2020, pp. 10-22). According to (Cardno, 2020, pp. 10-99) the TSF design includes

- A decant system to 'enable' return of decant water to the processing plant
- A leachate drainage system
- An 'appropriate' liner and seepage collection system
- No planned discharge of TSF water to watercourses
- 'Comprehensive' monitoring program
- Groundwater would flow to open cut pit void

Mudder and Botz (2001) is quoted in (DRET, 2008, p. 13) as saying that the main reasons for environmental incidents at mines stem from poor water management including inadequate design and maintenance. The presence of faults under the TSF, the lack of triggers and a contingency plan in case of a leak raises concerns about the proposed activity's ability to contain cyanide.

REFERENCES

ATC Williams, 2020. *Tailings storage facility preliminary design,* Melbourne: Bowdens Silver Pty Limited.

Cardno, 2020. *Aquatic Ecology Assessment,* Sydney: Bowdens Silver Mine.

DRET, 2008. *Cyanide Management: Leading practice sustainable development program for the mining industry,* Canberra: Department of Resources Energy and Tourism .

Jacobs (Australia), 2020. *Part 5 - Groundwater Assessment,* Sydney: Silver Mines Pty. Limited.

R. W. Corkery & Co. Pty. Limited, 2020. *EIS Bowdens Silver Project,* Sydney: Bowdens Silver Pty Limited.