Notes: At BHP Legacy Assets, our vision is to Reimagine the Legacy of Mining. We aspire to create a more positive legacy for mining, the environment, and the communities we operate in. Today I am going to present some lessons learned from over 20 years post-closure monitoring at BHP's legacy mine sites in North America. Before going any further, I would like to acknowledge my BHP colleagues listed here for their contributions to this presentation.

Disclaimer

Forward-looking statements

This presentation contains forward-looking statements, including statements regarding: trends in commodity prices and currency exchange rates; demand for commodities; production forecasts; plans, strategies and objectives of management; closure or divestment of certain assets, operations or facilities (including associated costs); anticipated production or construction commencement dates; capital costs and scheduling; operating costs and shortages of materials and skilled employees; anticipated productive lives of projects, mines and facilities; provisions and contingent liabilities; and tax and regulatory developments.

Forward-looking statements may be identified by the use of terminology, including, but not limited to, 'intend', 'aim', 'project', 'anticipate', 'estimate', 'plan', 'believe', 'expect', 'may', 'should', 'will', 'would', 'continue', 'annualised' or similar words. These statements discuss future expectations concerning the results of assets or financial conditions, or provide other forward-looking information.

These forward-looking statements are based on the information available as at the date of this presentation and are not guarantees or predictions of future performance, and involve known and unknown risks, uncertainties and other factors, many of which are beyond our control, and which may cause actual results to differ materially from those expressed in the statements contained in this release. BHP cautions against reliance on any forward-looking statements or guidance, particularly in light of the current economic climate and the significant volatility, uncertainty and disruption arising in connection with COVID-19.

For example, our future revenues from our assets, projects or mines described in this release will be based, in part, upon the market price of the minerals, metals or petroleum produced, which may vary significantly from current levels. These variations, if materially adverse, may affect the timing or the feasibility of the development of a particular project, the expansion of certain facilities or mines, or the continuation of existing assets.

Other factors that may affect the actual construction or production commencement dates, costs or production output and anticipated lives of assets, mines or facilities include our ability to profitably produce and transport the minerals, petroleum and/or metals extracted to applicable markets; the impact of foreign currency exchange rates on the market prices of the minerals, petroleum or metals we produce; activities of government authorities in the countries where we sell our products and in the countries where we are exploring or developing projects, facilities or mines, including increases in taxes; changes in environmental and other regulations; the duration and severity of the COVID-19 pandemic and its impact on our business; political uncertainty; labour unrest; and other factors identified in the risk factors discussed in BHP's filings with the U.S. Securities and Exchange Commission (the 'SEC') (including in Annual Reports on Form 20-F) which are available on the SEC's

website at www.sec.gov.

Except as required by applicable regulations or by law, BHP does not undertake to publicly update or review any forward-looking statements, whether as a result of new information or future events. Past performance cannot be relied on as a guide to future performance.

No offer of securities

Nothing in this presentation should be construed as either an offer or a solicitation of an offer to buy or sell BHP securities in any jurisdiction, or be treated or relied upon as a recommendation or advice by BHP.

Reliance on third party information

The views expressed in this presentation contain information that has been derived from publicly available sources that have not been independently verified. No representation or warranty is made as to the accuracy, completeness or reliability of the information. This presentation should not be relied upon as a recommendation or forecast by BHP.

BHP and its subsidiaries

In this presentation, the terms 'BHP', the 'Company', the 'Group', 'our business', 'organization', 'Group', 'we', 'us' and 'our' refer to BHP Group Limited, BHP Group Plc and, except where the context otherwise requires, their respective subsidiaries set out in note 13 'Related undertaking of the Group' in section 5.2 of BHP's Annual Report and Form 20-F. Those terms do not include non-operated assets. This presentation includes references to BHP's assets (including those under exploration, projects in development or execution phases, sites and closed operations) that have been wholly owned and/or operated by BHP and that have been owned as a joint venture operated by BHP (referred to as 'operated assets' or 'operations') during the period from 1 July 2020 to 31 December 2020. Our functions are also included.

BHP also holds interests in assets that are owned as a joint venture but not operated by BHP (referred to in this release as 'non-operated joint ventures' or 'non-operated assets'). Our non-operated assets include Antamina, Cerrejón, Samarco, Atlantis, Mad Dog, Bass Strait and North West Shelf. Notwithstanding that this presentation may include production, financial and other information from non-operated assets, non-operated assets are not included in the Group and, as a result, statements regarding our operations, assets and values apply only to our operated assets unless otherwise stated. References in this presentation to a 'joint venture' are used for convenience to collectively describe assets that are not wholly owned by BHP. Such references are not intended to characterise the legal relationship between the owners of the asset.

Land acknowledgement

BHP acknowledges that the land where we stand today is on the ancestral, traditional and unceded territories of the:

- xʷməθkʷəy̓əm (Musqueam),
- Sḵwx̱wú7mesh (Squamish), and
- səlilwətaɬ (Tsleil-Waututh) Nations.

We pay our respects to the First Nations ancestors of this place, and we honour their contributions, past, present and future.

(Source: https://vancouver.ca/people-programs/land-acknowledgement.aspx)

BHP

This Policy should be read in conjunction with BHP's 2030 Social Value Goals, Human Rights Policy Statement and Equitable Change and Transition Principles.

9 November 2022

Indigenous Peoples Policy Statement

(Source: https://www.bhp.com/sustainability/indigenous-peoples)

BC MEND ML/ARD 2022 Workshop – Vancouver, BC
November 30, 2022

3

BHP

Notes: Using lessons learned and hindsight from our experiences within BHP's Legacy Assets, the objective of my presentation today is to convey the following four key messages:

1) Relinquishment is a great aspiration for our mine sites, but we should develop, operate, and close our sites in the event long-term care and maintenance becomes a reality.

2) We should make closure-related decisions based on risks … not solely on regulatory compliance.

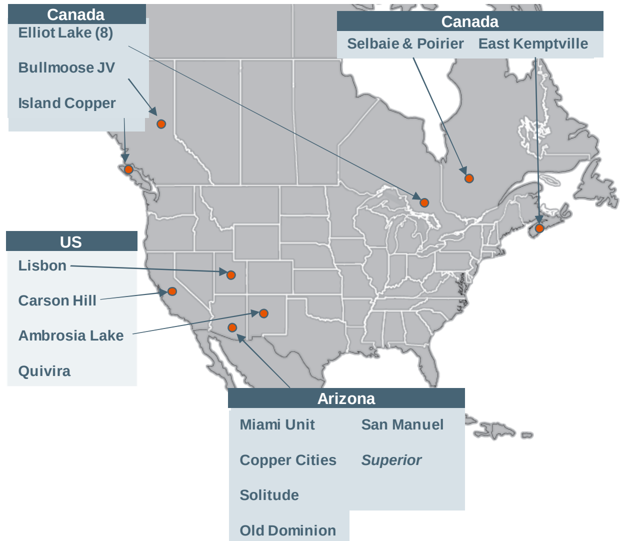
3) Selecting an optimized mine closure strategy should be based on the undiscounted value of estimated closure and post-closure costs as opposed to the discounted or present value of those costs.

4) Water is the 'golden thread' that ties all major post-closure elements together, including physical integrity of our rehabilitated mine waste storage facilities, overall performance of our reclaimed landscapes, and potential for maximizing socio-economic returns to the communities we operate in.

BHP Legacy Assets portfolio overview

We manage 23 non-producing sites, at various stages of closure & post-closure, focused on:

- Tailings dam risk mitigation
- Closure risk mitigation studies
- Remediation projects
- Care & maintenance
- Stakeholder engagement



Our base plan for most legacy sites is to hold in perpetuity … although we are actively seeking opportunities to build social value within the communities we operate in

BC MEND ML/ARD 2022 Workshop – Vancouver, BC
November 30, 2022

5

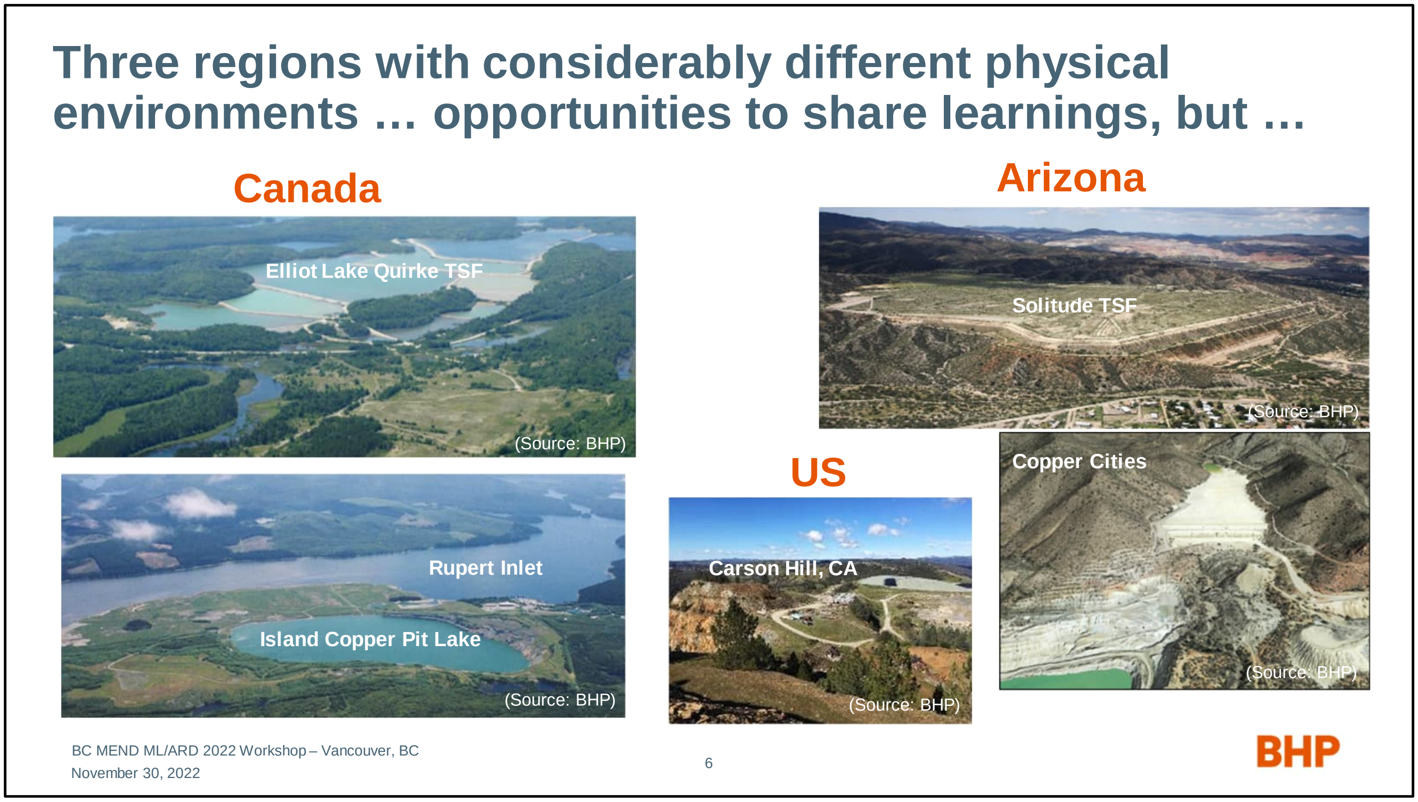
BHP

Notes: BHP's Legacy Assets team, comprising 200 employees and contractors, stewards 23 sites in various stages of closure and post-closure across Canada and the US. The sites are primarily the result of liabilities acquired through mergers and acquisitions. These sites mined and processed copper, zinc, uranium, tin, and gold. The aim is to progress these sites towards one of four closure outcomes: relinquishment, divestment, repurposing, or ongoing management in the most effective manner.

Activities at our legacy asset sites include:

- *Tailings dam risk mitigation work*
- *Closure risk mitigation studies*
- *Remediation projects* … typically in support of greater geotechnical stability and improved source control and protection of sensitive receptors.
- *Care and maintenance, and*
- *Stakeholder engagement* to build relationships and consult on closure expectations and limitations.

Only one site in our portfolio in the past 20 years has been relinquished. The current base plan for most of our sites is care and maintenance in perpetuity; however, we are actively evaluating our legacy sites or portions of them for added social value opportunities.



Notes: BHP's legacy sites span North America from coast to coast and from the cold and wetter regions of northern Canada to the hot and drier parts of the US southwest. Our sites are situated in varying climatic settings, ecosystems, hydrogeologic settings, and regulatory jurisdictions. While opportunities exist to share learnings, each site requires careful consideration of site-specific conditions to ensure effective, sustainable remedial solutions. The commonality for all our sites is that they stopped processing ore more than 18 years ago and possess knowledge bases with varying levels of robustness.

We have an abundance of water at most of our Canadian legacy sites, which offers more social value opportunities for local communities, but at the same time, closure risks are higher due to the potential for flooding and overtopping of our dam structures. On the flip side, water in the US southwest is relatively scarce, with regulations continuing to evolve in support of maximizing protection of surface and groundwater resources.

BHP's global mine closure strategy


Reclaimed Selbaie Mine, QC, c. 2007 (Source: BHP)

- In the past, mine closure across the industry was mostly about regulatory compliance, physical stability, revegetation … at the lowest cost possible
- Today, we are focused on achieving optimized closure outcomes on a fit-for-purpose, site by site basis considering interests such as obligations, BHP values, stakeholder expectations, and cost
  – Achieved by meaningful stakeholder consultation, continual integration of new knowledge and collaboration of SMEs throughout closure planning process, and risk-based decisions


Sheriff Creek Wildlife Sanctuary on Milliken TMA, ON (Source: BHP)

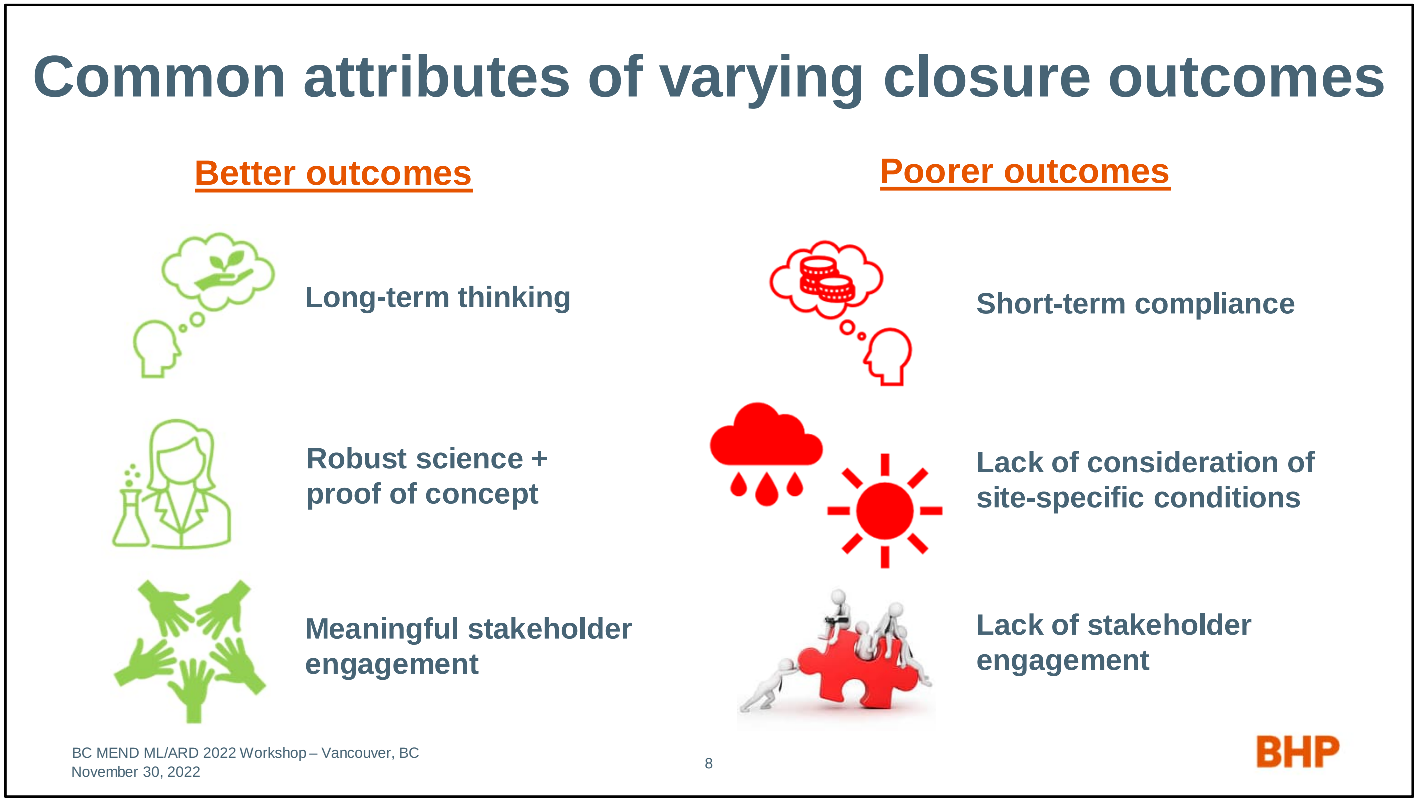
Miami Gardens Walking Path, Miami, AZ (Source: BHP)

BC MEND ML/ARD 2022 Workshop – Vancouver, BC
November 30, 2022

BHP

Notes: In the past, mine closure across the industry was mostly about meeting regulatory compliance with a focus on physical stability of the reclaimed landscape and revegetation of disturbed areas, with a preference for the lowest cost option, which typically only considered the discounted value of total estimated closure and post-closure costs.

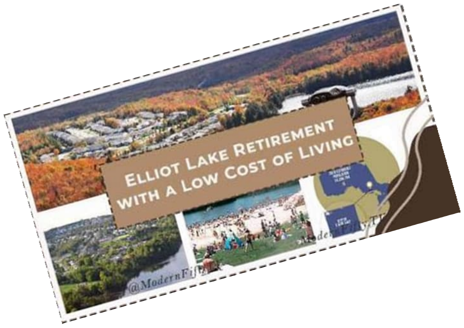
Today, BHP is focused on achieving optimized closure outcomes on a fit-for-purpose, site by site basis in consideration of sometimes competing interests such as obligations, BHP values, partner and stakeholder expectations, and cost. We achieve this through meaningful consultation with our stakeholders, continual integration of new knowledge and input from a wide array of subject matter experts into the closure planning process, and finally, making closure decisions based on BHP's appetite for risks and added social value.



Notes: It is acknowledged that how we optimized development and closure of some sites in the past was not necessarily the best in terms of post-operations life when we apply a modern set of optics. With the value of hindsight, I'm going to present some examples of good closure outcomes and not so good closure outcomes.

Good outcomes have focused on long-term thinking, robust science, and stakeholder engagement. And we generally have greater success when we trial and evaluate design concepts in the field prior to full-scale implementation. Poorer outcomes have resulted from short-term goals of regulatory compliance, a lack of consideration of site-specific conditions, particularly climatic and hydrogeologic setting, and isolated decision making inconsistent with the desires or values of surrounding communities.

Elliot Lake case study: closure success story



Technical elements:

- Water and vegetated covers over acid-generating tailings
- Water treatment and catchment health
- Dam maintenance and monitoring


Water cover for Quirke TSF (180 ha)
(Source: BHP)

Lessons learned:

1) Site characterization programs require collaboration of pertinent SMEs for optimized data collection
2) Focused performance-based monitoring with built-in triggers to support early detection of emerging issues
3) Water covers performing as designed, but dams will likely require in-perpetuity maintenance and monitoring


(Source: BHP)
Vegetation cover for Nordic TSF (107 ha)

BC MEND ML/ARD 2022 Workshop – Vancouver, BC
November 30, 2022 9 BHP

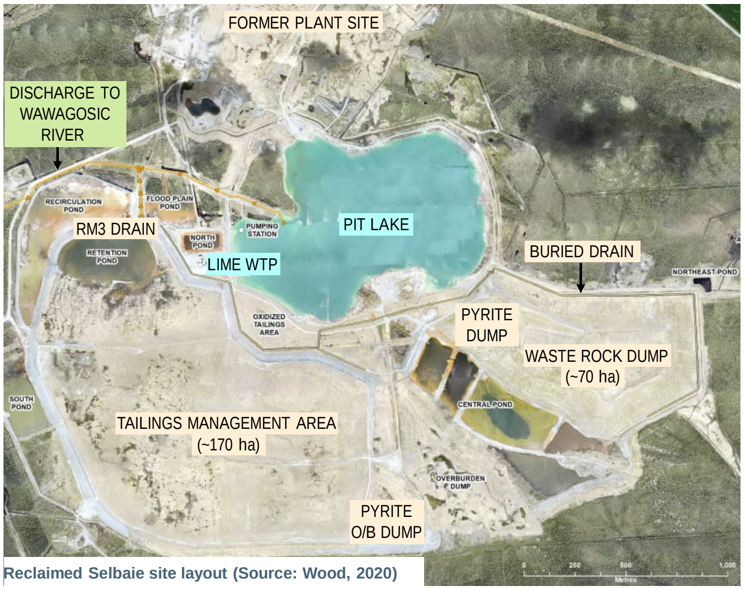
Notes: I'd like to start by sharing a closure success story from our Elliot Lake sites, which are in northern Ontario about 150 km west of Sudbury. A total of 12 uranium mines operated between 1956 and 1996. BHP acquired 8 of these mines in the early 2000s, when these sites were already in the post-closure phase. The city of Elliot Lake was created because of the abundance of uranium mining in the region. Unfortunately, the entire region was faced with closure in the mid-1990s due to the start-up of higher-grade uranium mines in Saskatchewan. Towards the end of mining, there were extensive collaborative talks between mining companies, regional communities, and all levels of government. The community desired and was successful in repurposing the town into retirement living.

Now let's switch our focus from good social outcomes to good technical outcomes. The region is situated in a semi-humid climate where the average annual precipitation and evaporation are about 950 and 600 mm, respectively. This climatic regime is ideal for water covers to mitigate the oxidation of acid-generating tailings as well as radon gas emissions. Most of the TSFs in the region were decommissioned with a water cover. A few TSFs, however, were rehabilitated with a surficial lime and soil amendment application followed by seeding of native plant species.

Elliot Lake's current closure strategy is management in perpetuity. On average, we treat between 11 and 20 billion litres of contact water per year across five water treatment plants. Water quality throughout the watershed has improved significantly since 1999. With few exceptions, water quality at potentially mine-impacted lakes is better than program benchmarks for the protection of aquatic life.

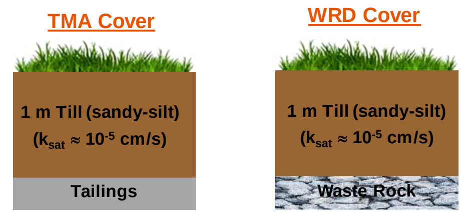
Based on our 20+ years of post-closure maintenance and monitoring in Elliot Lake, we have learned many lessons over the years, but I'd like to highlight these three today. 1) Before embarking on a large site characterization program for a given discipline such as geotechnical, make sure you consult with the hydro-geochemist, environment, and regulatory specialists to see if other data should be collected at the same time, thereby optimizing the mobilization of field personnel and sampling equipment. 2) Monitoring programs should be focused on key performance indicators with built-in triggers to support early detection of potential emerging issues and resulting adaptive management. And finally … the water covered TSFs generate much less acidic drainage compared to the vegetated TSFs and thus require less lime for treatment of mine-impacted water, but unfortunately, BHP will never be able to walk away from sites that have water retaining structures that meet the CDA classification of a "dam".

Selbaie Mine, QC case study: background



Reclaimed Selbaie site layout (Source: Wood, 2020)

- Site in northwest Quebec | cold, semi-humid climate (850 mm precip., 590 mm evap.)
- Cu-Zn mine operated 1981-2004
- Operations resulted in 18 Mm^3 PAG tailings and 16 Mm^3 PAG waste rock being stored in two unlined above-ground facilities
- Site reclaimed 2004-2006 including application of same cover design to both TMA and WRD



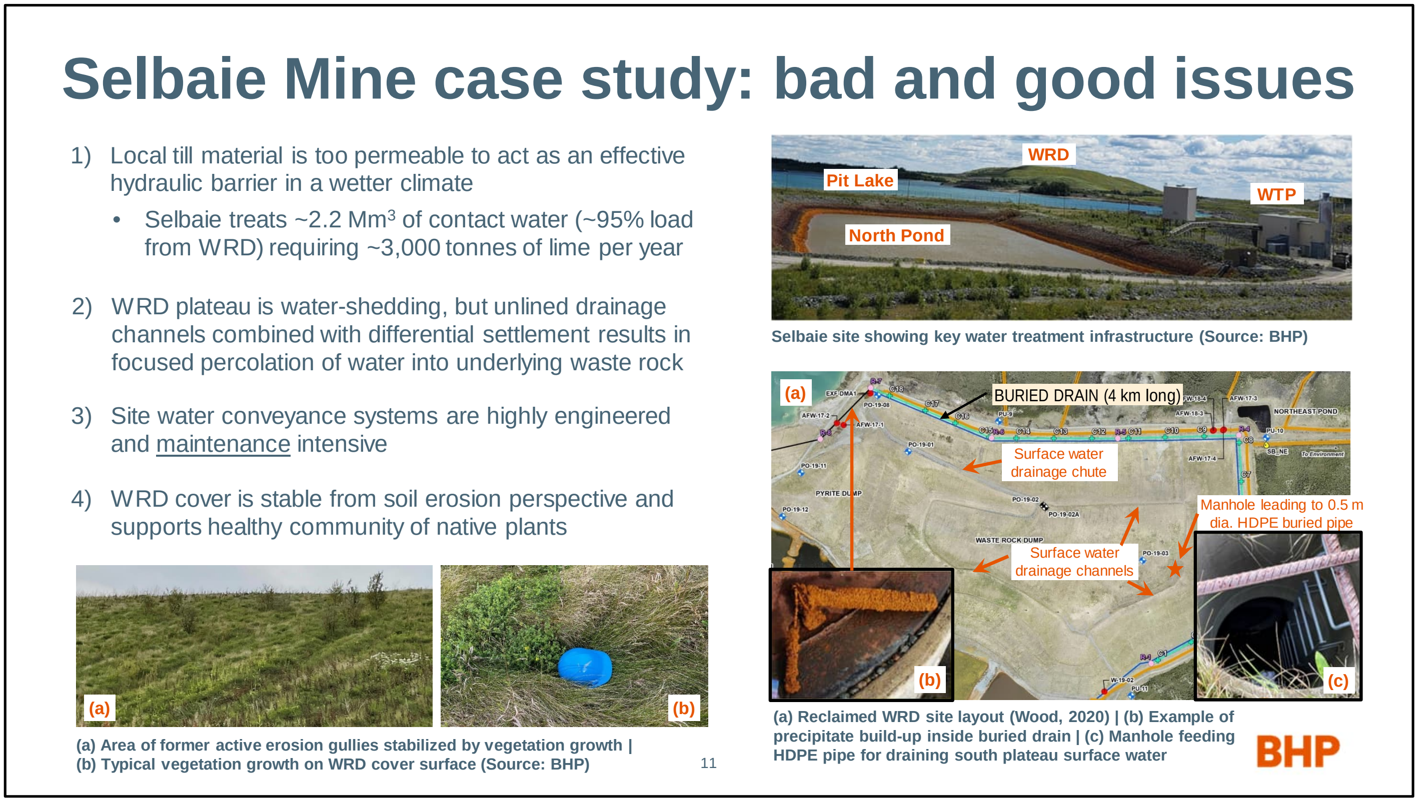
BC MEND ML/ARD 2022 Workshop – Vancouver, BC
November 30, 2022

10

BHP

Notes: Now to a case study where things could have been done better, to say the least. Selbaie, located in northwest Quebec, is 130 km from the nearest community, situated in a relatively cold, semi-humid climate with an average annual temperature of 0°C, 850 mm of precipitation, and 590 mm of evaporation. Selbaie was a surface and underground copper-zinc mine, which operated between 1981 and 2004. Site development included an open pit, 18 Mm^3 of PAG tailings stored in an unlined above-ground facility, and 16 Mm^3 of PAG waste rock stored in an unlined above-ground facility.

The site was reclaimed between 2004 and 2006 including re-contouring and covering the WRD and TMA with 1 m of sandy-silt glacial till, with a saturated permeability of about 10^{-5} cm/sec, followed by seeding with native grasses and legumes. The primary objective of the WRD cover was to limit percolation of precipitation water into the underlying waste material, while the primary objective of the TSF cover was to eliminate surface contact water while allowing sufficient infiltration to keep the tailings mass saturated, thereby mitigating oxidation of the sulphidic-rich tailings.



Notes: From a cover design perspective, we have a couple issues … 1) the local till material is too permeable to act as an effective hydraulic barrier in a wetter climate , and 2) the same cover design was used on both facilities but with different design objectives. This causes me considerable heartburn as a cover system SME. Based on water and load balance modelling of the site, net percolation across the waste rock pile cover is an estimated 45% of annual precipitation.

Guess what …. we have a lot of acidic seepage emanating from the waste rock pile. On average, we treat 2.2 Mm^3 of contact water requiring 3,000 t of lime per year, with an estimated 95% of the total acidity loading coming from the waste rock pile. Treated water is directed to the Pit Lake for polishing prior to discharge to the environment. The good news is that the Pit Lake has about 300 years of sludge storage … the bad news is … without additional remedial measures, we could potentially be treating water at this site for the next 800 years.

A second issue for the reclaimed WRD landform is that while the plateau area incorporates positive drainage, runoff waters are directed to plateau perimeter drainage channels, but due to the relatively low gradients, lack of an underlying compacted soil or geosynthetic liner, and some localized differential settlement, it is hypothesized that very little plateau runoff water reaches the perimeter drainage channels at the toe of the waste pile.

Another issue for this site is the fact that the surface and seepage collection and conveyance systems are highly engineered and maintenance intensive. For example, plateau runoff water that accumulates in the south drainage channel drains into a manhole that feeds an HDPE pipe buried in the outer slope of the waste rock pile. Toe seepage from the waste rock pile along the east and north sides is collected in a 300 mm diameter perforated HDPE pipe embedded in sand and gravel. Unfortunately, due to geochemical reactions in the buried drain, precipitates build up to the point where the drain and chimney features need to be cleaned out annually.

The one good aspect of the reclaimed waste rock pile is that while the sandy-silt till cover material was initially prone to rilling and gullying, the coarser fraction of the glacial till material combined with the root mass of the native grasses worked to stabilize the cover surface. The vegetation community is currently dominated by native grass and legume species, but woody species are beginning to naturally colonize on the cover surface, particularly in the wetter soil regimes on the north slope.

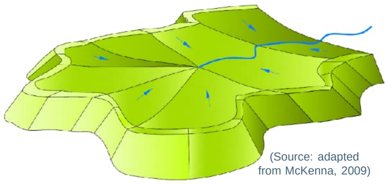
Selbaie Mine case study: lessons learned

Landform design / surface water management:

1) Eliminate potential for plateau runoff waters accumulating near slope crests
2) Incorporate low-permeable liner beneath plateau drainage channels to ensure conveyance of collected runoff waters off the landform

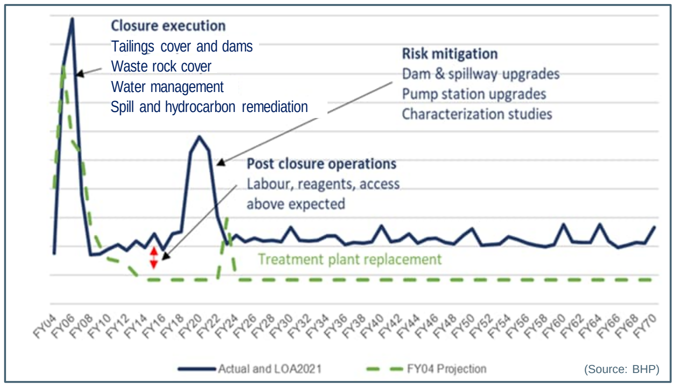
Evaluation of closure strategies:

1) Undiscounted, total costs provide a much better indication of true cost for given closure strategy
2) Spend $$ up-front for robust site characterization and analyses to support thorough evaluation of closure strategy performance over long term



(Source: adapted from McKenna, 2009)

(Source: BHP)



(Source: BHP)

BC MEND ML/ARD 2022 Workshop – Vancouver, BC
November 30, 2022

12

BHP

Notes: We have learned many lessons from over 15 years of post-closure care and maintenance at Selbaie, and of course hindsight is always 20/20, but here are some lessons learned from a landform design and surface water management perspective.

#1 – the potential for plateau runoff waters accumulating near slope crests should be eliminated by using a saddle landform design as shown here. Two potential failure modes exist when you accumulate surface water near a slope crest … the first is the potential for surface water flowing uncontrollably over the slope crest due to a blockage in the drainage channel, and the second is the potential for focused infiltration of ponded water in the event of a channel blockage, which could lead to elevated pore-water pressures and subsequent instability of the slope below.

#2 – when we go to the effort of shedding incident precipitation water off the plateau of our reclaimed waste stockpiles, we want to make sure the diverted surface water is conveyed off the landform to minimize the potential of this water infiltrating and percolating through the underlying waste material at some point further down-gradient. This can be accomplished by incorporating a geosynthetic or compacted soil liner below the rock armouring material within the drainage channel.

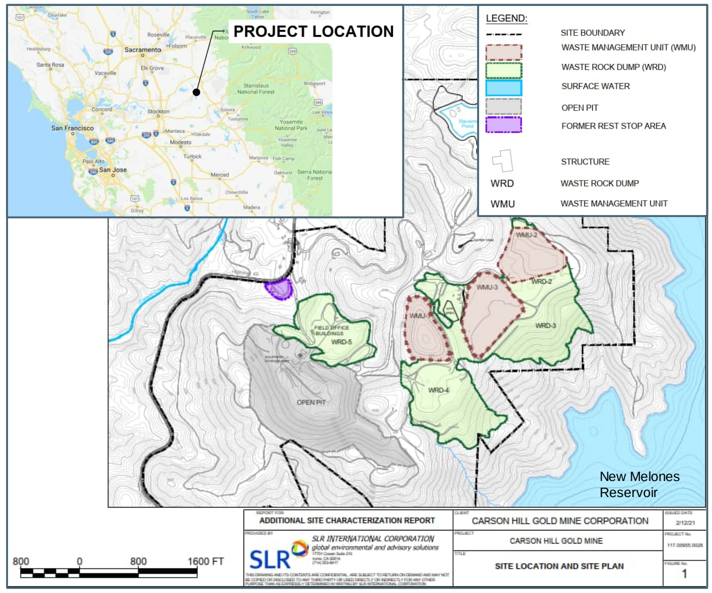
The graph here shows a profile over time of relative closure costs for Selbaie. The green dashed line is the original 2004 projection while the solid blue line is an updated projection from 2021. The initial peak shows closure execution costs for site cleanup and reclamation. A few years into closure, the increased onsite workforce and lime usage resulted in a doubling of annual operating costs. To put things into perspective, a rough estimate of closure costs as a proportion of copper unit revenue generated during operations indicates that the initial closure cost was 17% of revenue, but now the updated closure cost is 36% of revenue.

In hindsight, the waste rock should have been relocated to the open pit and submerged below water … this would have been two to three times the cost compared to covering the waste rock in place, but now we are stuck in a long-term management scenario. And if more dollars would have been spent up-front for additional site characterization and analyses to support a more thorough evaluation of various closure options, it is very likely that the chosen closure plan at least for the WRD, would have been much different.

Carson Hill Gold Mine case study: context

- Open pit mining 1986-1989 left four WRDs and three heap leach pads ("WMUs") … non acid-generating
- WMUs reclaimed in mid 1990s by rinsing to remove cyanide & other COCs, then regrading & revegetation
- Property acquired by 3rd party in 1996 for aggregate business, including selling spent ore in WMUs, but … *final closure obligations remained w/ mining company*
- WMU overtopping 1994-2006 during wet periods, resulting in impacts to water (SO_4, TDS)

Aggregate operation near Carson Hill open pit c. 2020 (Source: BHP)



Carson Hill Gold Mine site layout (Source: SLR, 2021)

BC MEND ML/ARD 2022 Workshop – Vancouver, BC
November 30, 2022

13

BHP

Notes: I'd now like to present to you a case study where one of BHP's legacy sites was divested over 15 years ago, but in hindsight, it was not a wise decision. The former Carson Hill gold mine is in eastern California in the upper foothills of the Central Sierra Nevada Mountain range. The climate is Mediterranean, with hot dry summers (average 32°C) and cool wet winters (average 10°C), and a mean annual rainfall of 750 mm.

In 1986, Carson Hill Gold Mining Company, owned by WMC of Australia, began operations including an open pit or side-cut to access ore for heap leaching of gold using cyanide extraction technology. The operation resulted in the construction of four waste rock piles and three heap leach pads that are now referred to as Waste Management Units or WMUs. Open pit mining and heap leaching operations ceased in October 1989. The leach pads were rinsed to neutralize and remove cyanide and other constituents of concern, or COCs, that were considered a threat to water quality. The waste rock piles were regraded and revegetated concurrently with mining and were considered stable and reclaimed at the end of mining. The California Regional Water Quality Control Board approved closure of the WMUs as Group C mining waste, and between 1992 and 1994, the site was closed in accordance with an approved closure plan.

In 1996, a third-party purchased the closed property from WMC to operate the site as Carson Hill Rock Products. Their operations included mining of spent ore from the WMUs and rock from the open pit, and operating a commercial rock crushing, screening, and aggregate washing plant. As part of the 1996 Purchase and Sale Agreement, WMC retained final closure and environmental liability responsibilities for the property, which was transferred to BHP through acquisition of WMC in 2005.

Infiltration of rainwater through the vegetative covers into the WMUs resulted in periodic overtopping between 1994 and 2000 and again in 2006. Waters from the WMUs flowed into the surrounding waste piles and native rock materials, resulting in impacts to water quality with elevated concentrations of TDS, sulfate, cyanide, nitrate, and certain metals. Although closure of the heap leach pads was approved by relevant regulatory agencies in the early 1990s, the Water Board concluded in 2005 that groundwater quality at the site did not meet applicable standards and required the implementation of certain corrective actions.

Carson Hill case study: lessons learned

The problem and solution:

- Original, regulatory approved closure plan failed, requiring BHP to develop and implement a new closure plan
- Ownership of the property by another entity strictly limited BHP's options for site closure
- BHP reacquired ownership of Carson Hill in November 2021

Lessons learned:

1) Closure decisions should be driven by risks, not solely regulatory compliance (*approved WMU vegetation covers, combined with underlying double liner, did not appropriately consider risks associated with contact water overtopping*)
2) Divestment structure of late life assets is critical

Water Treatment Plant and WMU-1 in background (Source: BHP)

BHP reacquires Carson Hill property in Nov-2021 (Source: BHP)

BC MEND ML/ARD 2022 Workshop – Vancouver, BC
November 30, 2022

14

BHP

Notes: In summary, the original, regulatory approved mine closure plan for Carson Hill failed, requiring BHP to develop and implement a new closure plan through regulatory orders in the mid 2000s. BHP has been collecting and treating contact water at the site since 2007 as well as maintaining interim geosynthetic covers over the WMUs; however, more sound remedies such as final covers over the WMUs per California mine waste regulations were not an option due to the site owner's plan of selling all the spent ore material. BHP performed interim closure measures for more than a decade working alongside the owner of the property, while also contemplating reacquiring the property to gain full control of activities at the site. The most recent and successful attempt at reacquisition took 3 years of planning and negotiations and concluded in November 2021.

This case study highlights two important lessons. One … decisions associated with final closure or reclamation of a site or domain should be driven by risks, not solely regulatory compliance. Based on the classification of the WMU waste material, WMC was permitted to simply regrade and revegetate the heap leach pads. But, given the local climatic conditions and the fact that the WMUs are underlain by a double liner system, it was only a matter of time before the 'bathtubs' filled up and overtopped. The WMUs should have been reclaimed with a very low infiltration cover system, and/or the WMU dewatering systems should have been operated to prevent overtopping of contact water. And finally … if you have a closed property and another entity wants to buy the property, make sure sufficient due diligence is undertaken to substantially lesson the potential for future responsibilities of environmental liability.

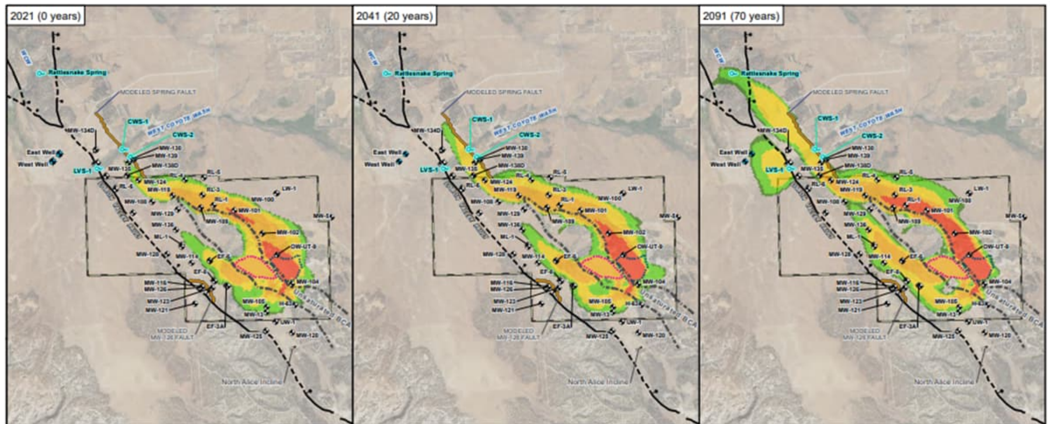
Lisbon Uranium Facility, Utah case study

Background:
- Site near La Sal, UT, 50 km SE of Moab | cold semi-arid climate
- Uranium mine/mill operated 1972-1989, reclaimed in 1990s
- Unlined TSFs located above surface & groundwater divide

Issue:
- Initial corrective action plan did not work as planned to slow migration of groundwater plume

Future remedy plans:
- Implement corrective action plan comprising engineered and administrative controls

Lessons learned:
- Go beyond the regulatory minimum (risk-based)
- Develop a robust CSM earlier and progressively refine



A future without corrective action

Publicly available: https://deq.utah.gov/businesses-facilities/rio-algom-mining-llc

Figure 5.37
Predicted Uranium Concentrations for Deep BCA Pathway and Deep Navajo Aquifer in 2021, 2041, and 2091 for 0, 20, and 70 Years of the Predictive Period
Hydrogeological Supplemental Site Assessment Phase 4, Lisbon Facility

BC MEND ML/ARD 2022 Workshop
November 30, 2022

INTERA 15 BHP

Notes: Now let's talk about a case study that involves impacts to groundwater from two unlined TSFs at a former uranium mill site near the community of La Sal, which is about 50 km southeast of Moab, Utah. The Lisbon site, which produced uranium concentrate between 1972 and 1989, was reclaimed in the 1990s. One of the unfortunate aspects of this site is the location of the TSFs … they were sited over a surface AND groundwater divide.

Impacts to groundwater were detected in the 1970's and a groundwater corrective action plan comprising pump & treat was implemented followed by monitored natural attenuation. After about 15 years of monitoring, natural attenuation proved insufficient to meet the State of Utah groundwater standards at the point of compliance because of an incomplete understanding of the conceptual site model, or CSM, as the basis for the fate and transport model.

Field studies over the last 5-years have refined the CSM and improved the groundwater fate and transport model. The drawing shown here is the output from this modelling effort, which illustrates, without further treatment or corrective action, the plume could affect potential receptors in the coming decades. Studies are now underway to identify technologies capable of limiting plume migration, with the final corrective action likely being a combination of engineered and administrative controls.

So what are the key lessons learned from this case study:

#1 … go beyond the regulatory minimum when designing and closing TSFs to better protect the environment,

#2 … develop a robust CSM early in the mine life cycle to inform appropriate monitoring and early detection of issues, AND

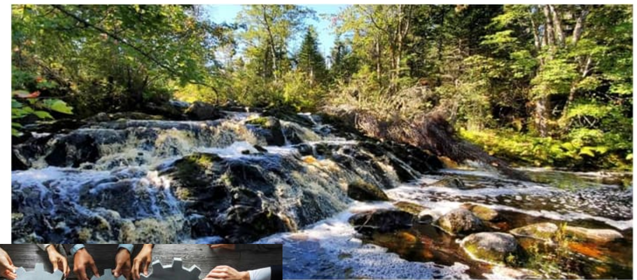
#3 … refine the CSM over time as new information comes to light and integrate back into the closure planning process.

I'd like to raise an important point regarding the location of the tailings impoundments, which obviously would be considered non-viable today. In the late 1960's, groundwater wasn't seen as the valuable resource that it is today, and a little groundwater contamination was viewed as the price of industry and national defense by everyone involved, including the mining company, regulators, and local communities. Planning for development of the Lisbon site including the location of the tailings impoundments was risk-based; however, society's risk appetite changed since initial construction of the site in the late 1960's. We are never going to pre-empt everything that comes at us; however, risk-based closure decisions are always going to be that step ahead of choices driven by regulatory compliance.

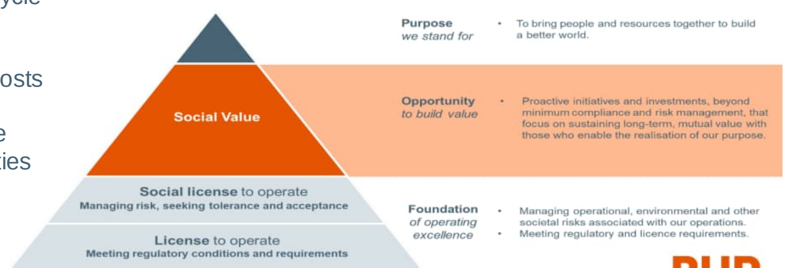
The good news for Lisbon is that there is a pathway to relinquish the mill site to the US Federal Government when agreed outcomes for groundwater, soil, and final configuration of the tailings impoundments have been met.

Closing remarks

- Technically speaking:
  - Robust science + proof of concept
  - Climate change is real … design for it!
  - Water is the 'golden thread' …
- Continual integration of new knowledge and collaboration of SMEs throughout the closure planning process is paramount
- Relinquishment is a great aspiration, but think long term throughout every phase of the mine life cycle
- Closure strategy options should be evaluated based on undiscounted closure/post-closure costs
- Opportunities for building social value increase dramatically when trailing environmental liabilities have been robustly addressed



(Photo Credit: Gavin Eldridge, BHP)



BC MEND ML/ARD 2022 Workshop – Vancouver, BC
November 30, 2022

16

BHP

Notes: In closing, from a technical perspective, using robust science as well as proofing concepts in the field are two factors that lead to a much higher probability of closure remedies meeting their design objectives. Climate change predictions need to be part of base case analyses during design … not part of a sensitivity analysis. And water is the golden thread that ties all major closure elements together.

Continual integration of new knowledge and collaboration of SMEs throughout the closure planning process is paramount for achieving successful closure outcomes.

While relinquishment is a great aspiration for our mine sites, we should develop each site domain and carry out investigations assuming that we may be stuck with our sites for a very long time. We also stand a far greater chance of relinquishing our properties when we make decisions that are risk-informed as opposed to compliance-driven.

When evaluating various closure strategies for a site or domain from a cost perspective, the undiscounted total closure cost provides a better assessment of total dollars projected to be spent over the life of the asset. If we select closure strategies based on NPV, we would favour strategies that offer the least number of opportunities to build social value while at the same time, leaving the site and owner exposed to higher closure risk due to issues such as changing societal and regulatory demands, climate change, and emerging chemical species of concern. And lastly, we have learned that opportunities for building social value dramatically increase when trailing environmental liabilities are robustly addressed.

BHP