

# BC MINING LAW REFORM



## Placer Mining

## University of Victoria Environmental Law Centre



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# Introduction

Placer mining—the excavation of both ancient and existing stream beds to retrieve minerals deposited in sand and gravel by water—poses a serious risk to watersheds across British Columbia. It can gut invaluable riparian areas, and permanently damage streams, devastate fish populations, and threaten human health. It can also interfere with hunting, fishing and gathering practices, and infringe Indigenous rights. The amount of placer mining activity in BC has increased dramatically in recent years, with approved machine-excavation operations almost tripling since 2005.<sup>1</sup>

While activity is increasing, regulation of placer mining in BC remains inadequate.<sup>2</sup> For example, in sharp contrast to the Yukon, placer mines in BC do not undergo environmental assessments before they are approved.<sup>3</sup> Further, once operations are underway, government seldom inspects placer mine operations to ensure existing rules are enforced. Rule-breaking is common, and placer-mined areas often go un-reclaimed, leaving long-term scars on the landscape.<sup>4</sup>

Across the province, government is not enforcing adequate 'setback' requirements to keep placer operations out of sensitive streams, lakes, and wetlands. In the Atlin area, government has explicitly sacrificed streams to enable placer mining by suspending pollution rules and allowing miners to discharge waste directly into these natural water bodies.<sup>5</sup>

BC's current regulatory approach to placer mining jeopardizes Indigenous lands, valuable public assets and unique ecosystems—the regime is in urgent need of an overhaul. Critical areas for reform include:

- effective environmental protection for streams, fish, and human health;
- respect for Indigenous rights and adherence to United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) principles;
- assessment of proposed placer mining operations;
- effective monitoring, reporting and enforcement of regulatory compliance; and
- improved mine reclamation policies and security requirements.

## Riparian habitats and 'setback' rules

British Columbia currently has lax standards when it comes to keeping placer mines out of sensitive water bodies and riparian areas. Riparian areas—the banks of streams and water bodies—are "nature's most biologically productive terrestrial systems."<sup>6</sup> Such areas provide important habitat for almost two thirds of Canada's rare and endangered species, as well as iconic species like salmon.<sup>7</sup> Riparian vegetation also slows the flow of sediment

into streams and provides a buffer zone for streams and rivers by trapping pathogens and pollutants.<sup>8</sup> Healthy, fish-bearing streams cannot exist without a healthy riparian zone.<sup>9</sup>

Placer mining can release massive amounts of sediment into streams, which harms fish by clogging gills, reducing the ability of predator fish to locate prey, and reducing the survival of eggs and fry in stream beds.<sup>10</sup> When examining the depletion of sockeye salmon in the Fraser River, the Cohen Commission found that:

*...placer mining has a potentially severe impact on sockeye salmon because many alluvial deposits are closely associated with existing streams, and because water is often used to separate placer minerals from the gravel matrix.<sup>11</sup>*

Even low levels of suspended sediment can have similar consequences for salmon and other fish species.<sup>12</sup> Notably, a study conducted in the Yukon found unmined streams "support a standing stock of fish 40 times that of placer-mined streams."<sup>13</sup>

Placer mining, by its very nature, takes place in and around riparian areas where water and gravity bring minerals (like gold) to streambeds. The placer mining excavation process, poorly designed roads that increase sediment in waterways, and the use of toxic substances like mercury in the mining process can be devastating to these ecologically significant areas.<sup>14</sup> Unfortunately, as confirmed in a 2010 audit of 23 placer mines in the Cariboo, the location of placer mines is "strongly correlated with areas of high value habitat including critical habitat for fish, wildlife habitat areas, ungulate winter ranges, old growth forests and riparian areas."<sup>15</sup> Of the 10,734 hectares of critical fish habitat identified in the audit area, 63% of this habitat was subject to placer mining tenures.<sup>16</sup>

The use of riparian setback requirements to protect important ecological values is a well-established environmental practice.<sup>17</sup> For example, the default setback of urban development from streams is 30 metres, and the setback for forestry activities is commonly 20–50 metres.<sup>18</sup> At the same time, placer mines are only subject to a 10-metre setback policy that has been under-enforced and routinely ignored.<sup>19</sup> The 2010 Cariboo placer mining audit found that more than half of the audited mines were operating within the 10-metre placer riparian reserve setback—while 43% of the mines were conducting in-stream works without authorization.<sup>20</sup>

Establishing stricter regulations and adequate enforcement—even simply increasing and enforcing riparian setbacks to keep placer operations further away from streams—could significantly reduce the risks and impacts of placer mining on BC's riparian areas and everything that depends on them.

- 1. RECOMMENDATION: Enact a clear minimum riparian setback requirement of at least 30 metres for any placer mining activities.**

# Indigenous rights and placer mining

Placer mining in BC has historically affected Indigenous peoples disproportionately. The 1868 Cariboo gold rush spurred rapid immigration into First Nations' territories in the Interior. This influx of miners sparked a smallpox epidemic that killed at least half the Indigenous population and led to significant Indigenous-settler clashes.<sup>21</sup>

BC's placer mining laws in 2018 still reflect a 19<sup>th</sup>-century colonial approach to Indigenous rights and lands. In many parts of the province, there is still a lack of recognition of the jurisdiction and authority of Indigenous governments, even as placer mining activities affect the ability to pursue traditional activities and to proactively steward lands and resources. Placer mines routinely prevent Indigenous peoples' access to important sites and can degrade ecosystems that are culturally significant and central to community health.<sup>22</sup> In some parts of the province, streams can host hundreds of active mine sites, each of which is required by law to control public access.<sup>23</sup> The resulting blocked access can interfere with fishing, hunting, gathering, cultural practices and other constitutionally protected rights.<sup>24</sup>

Despite these impacts, the current government's consultation process often involves a 30-day notice-and-response period in which First Nations are asked to respond to placer mining proposals in their territory. This is far from a meaningful process aimed at securing the free, prior and informed consent of those Nations (see "Indigenous Governance and Mining").<sup>25</sup>

- 2. RECOMMENDATION: Ensure placer mining development proceeds only if it has the free, prior and informed consent of affected First Nations.**

## Assessment of impacts

Placer mining is essentially exempt from environmental assessment in BC. New placer mines only trigger an assessment if they will have a production capacity of at least 500,000 tonnes of pay-dirt a year—a threshold so high that it has excluded every single placer mine in the province.<sup>26</sup> By comparison, proposed mineral mines trigger an environmental assessment at 75,000 tonnes, and coal mines at 250,000 tonnes.<sup>27</sup> Even the laws regulating large-scale placer mining (with excavation machinery) are insufficient to ensure that impacts are assessed as required to ensure that significant environmental damage is averted.<sup>28</sup>

The absence of BC environmental assessments of placer mining contrasts sharply with the Yukon, where 572 placer projects were assessed between 2008 and 2017.<sup>29</sup> Yukon decision makers must also consider the cumulative effects of placer mines in combination with other projects when assessing proposed placer projects.<sup>30</sup> If BC wants to protect its watersheds, it must begin to properly assess the individual and cumulative impacts of hundreds of placer mining operations in sensitive watersheds across BC.

- 3. RECOMMENDATION: Require environmental assessments for proposed placer mining operations, including the assessment of cumulative impacts of multiple placer mines within the same watershed.**

# Enforcement

The 2016 Auditor General's report found BC has a "limited compliance and enforcement program" for mining and a focus on *permitting* rather than monitoring, compliance or enforcement (see "Monitoring and Enforcement").<sup>31</sup> In the placer mining context specifically, inspection rates are very low. On average over the past decade, the number of annual inspections was equal to only one quarter of the total number of placer mines.<sup>32</sup> Actual annual inspection rates are likely even lower than one in four, because inspectors inspect 'problem' mines several times a year, inspect some mine sites twice in a single day, and include inspections of abandoned and non-operational placer mines in their figures.<sup>33</sup>

The non-compliance rates for placer mining operations are troubling. The 2010 audit of 23 active Cariboo placer mines found that almost three quarters of them were out of compliance with their Notice of Work permit requirements.<sup>34</sup> More than half of the audited placer mines were operating too close to the stream bank, and 26% were operating in areas identified as critical fish habitat. Forty-three percent of mines audited had unauthorized in-stream works, and 35% were illegally discharging wastewater into natural water bodies.<sup>35</sup>

4. **RECOMMENDATION: Require effective monitoring, inspection, enforcement, and reporting for placer mining, including:**
  - government tracking of mercury and other placer-related contaminants in BC's placer-mined watersheds;
  - annual inspections of all operating placer mines, and biennial inspections of closed mines until reclamation is complete and independently verified;
  - increased penalties to deter illegal practices, including escalating penalties for repeat offenders;<sup>36</sup>
  - the collection and annual publication of relevant placer mining statistics, such as number and location of mines permitted, production volumes, reclamation and closure costs, the number of inspections and inspection results, and enforcement actions taken.

## Reclamation security

Although mining permit conditions generally require placer miners to carry out reclamation activities, the 2010 Cariboo audit identified only one placer mine that was actually performing the reclamation work required by its permit—all other audited operations were effectively out of compliance with their permits.<sup>37</sup> Further, data from the past decade suggests that a significant number of 'closed' placer mines in the province lack a clear record of reclamation, while many others have not posted adequate security to cover their estimated clean up costs.<sup>38</sup> The provincial government and BC taxpayers will ultimately bear either the financial burden of reclaiming these sites or the cumulative environmental costs of leaving them un-reclaimed.

By legally requiring placer miners to post adequate reclamation security, the province can incentivize placer miners to promptly complete site restoration and protect the public from the cleanup costs associated with abandoned mines.<sup>39</sup> While the Ministry of Energy, Mines and Petroleum Resources (MEM) generally requires placer miners to post reclamation security, the specific dollar amount that is set for each project is left to the discretion of the Chief Inspector of Mines and inspector-delegates. There is no mandatory minimum or legislated requirement that the dollar amount must reflect the project's specific environmental and financial risks.<sup>40</sup> Further, under the *Mines Act*, the Chief Inspector of Mines can choose whether a placer miner is required to post reclamation security before beginning mining activities.<sup>41</sup> Despite the extensive ecological damage that can be left behind by placer mining activities, reclamation security is not yet a mandatory requirement under BC law.<sup>42</sup>

- 5. RECOMMENDATION: Remove the Chief Inspector's discretion over security requirements and require that all placer mines post full security that is based on defensible and independently verified calculations.**

## Mercury and other toxic chemicals

The World Health Organization lists mercury as one of the world's 10 most harmful chemicals, causing significant fetal harm and serious human health problems, especially in young children.<sup>43</sup> Toxic mercury from historical placer mining is a real concern. Near the gold rush hub of Barkerville, Jack of Clubs Lake has a long-standing mercury advisory ("WARNING: Lake trout over 45 cm may contain elevated mercury levels. Limit your consumption") that may be due in part to historic placer mining pollution.<sup>44</sup> The only BC



study of mercury levels in a historical placer mining area revealed levels up to 200 times higher than expected at some sites on the Lillooet River near Port Douglas.<sup>45</sup>

Although mercury is not legal to use today, modern placer mining can mobilize highly toxic mercury from historical placer mining operations back into streams. Gold rush-era placer miners used mercury to increase gold particle recovery in their sluice boxes, introducing large amounts of the toxic substance into BC waterways in the process.<sup>46</sup> Approximately 2090 kg of mercury flows out of the Fraser River each year, a portion of which is likely attributable to historic placer mining.<sup>47</sup>

Placer mining also poses a risk to drinking water when disturbed sediment releases other contaminants into waterways. Although modern placer mining regulations normally require miners to "divert process water into a settling pond and allow the water to seep into the ground," since 1988 Atlin-area placer miners have been granted a special legal exemption that allows them to dump wastewater directly into creeks. This has compounded gold rush-era impacts in the area.<sup>48</sup> Downstream tests have found "levels of aluminum, arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, vanadium, and nickel that exceed drinking water guidelines."<sup>49</sup> A 2013 Ministry of Environment study found that aluminum levels in one creek exceeded drinking water guidelines by a factor of 624, while samples taken farther away revealed aluminum levels seven times the recommended maximum.<sup>50</sup>

**6. RECOMMENDATION: Repeal section 3(c)(i) of the *Placer Mining Waste Control Regulation* to give the Atlin region the same minimum protections from placer mining that the rest of the province enjoys.<sup>51</sup>**

**7. RECOMMENDATION: Require assessment of the sedimentation and toxic chemical profile of BC watersheds where placer mining has occurred and designate areas where levels are below provincial health standards 'off-limits' to placer mining until a remediation plan is in place.**

## Placer jade impacts — an emerging concern

BC's growing placer jade mining industry raises additional issues.<sup>52</sup> Operating in the Cassiar and Tournigan River regions of northern BC, placer jade miners use heavy machinery to extract massive boulders (weighing up to 30 tons) from streambeds and riparian areas.<sup>53</sup> The scale of placer jade extraction and potential consequent

environmental disruption raises unique concerns. Any reform of BC's regulatory approach to placer mining must include rules to properly control impacts of the emerging placer jade mining industry.

- 8. RECOMMENDATION: Develop strong rules to control the specific impacts of jade mining, including large boulder removal from streambeds and riparian areas.**

## Endnotes

- 1 Placer mines that use machinery to excavate and require a provincial Notice of Work to operate almost tripled in a decade, from 187 mines with an active permit in 2005 to 542 in 2016. Smaller-scale placer hand mining has also increased, from 1888 claims reporting work in 2005 to 2917 claims reporting work in 2015. The prevalence of hand panning, which requires no mineral claim or permit, is unclear. See: Fair Mining Collaborative, *BC Placer Mining: High Environmental Impacts vs Low Economic Return* (March 2017) online: [www.fairmining.ca/wp-content/uploads/2018/03/BCPlacer\\_Environment\\_Economic.pdf](http://www.fairmining.ca/wp-content/uploads/2018/03/BCPlacer_Environment_Economic.pdf).
- 2 Tara Lamothe-Ammerlaan et al, "The New Gold Rush: Placer Mining in the Fraser Watershed," *BC Studies No.196: Perspectives on Gold Rush BC: Winter 2017/18* (2018 February 1) at p. 117. Recent studies by Fair Mining Collaborative document the grievous under-regulation of placer mining in the province. See *ibid*; Fair Mining Collaborative, *The New Gold Rush: Placer Mining in the Fraser Watershed* (April 2017) online: <http://www.fairmining.ca/wp-content/uploads/2018/03/NewGoldRush.pdf>; Fair Mining Collaborative, *Stirring Up the Sentiment: An Overview of Placer Mining in British Columbia* (September 2016) [unpublished draft report, on file with the University of Victoria Environmental Law Centre] at p. 1, 7; Fair Mining Collaborative, *Lost Creeks: the Atlin Watershed and Placer Mine Reclamation* (2017) [unpublished draft report, on file with the University of Victoria Environmental Law Centre].
- 3 Tara Lamothe-Ammerlaan et al, "The New Gold Rush: Placer Mining in the Fraser Watershed," *BC Studies No.196: Perspectives on Gold Rush BC: Winter 2017/18* (2018 February 1) at p. 132.
- 4 Michelle Arcand and Joanne McLeod, *Cariboo Region Placer Mine Inspection Report* (BC Ministry of Forests, Lands and Natural Resource Operations, December 2011) at pp. 1, 4, 6, in FOI Request—FNR-2012-00238, Response Package at Part 4, p. 4 online: [docs.openinfo.gov.bc.ca/D10015613A\\_Response\\_Package\\_FNR-2012-00238.PDF](http://docs.openinfo.gov.bc.ca/D10015613A_Response_Package_FNR-2012-00238.PDF).
- 5 *Placer Mining Waste Control Regulation*, BC Reg 107/89, ss. 2-3. In practice, miners in the Atlin area use tailings ponds, but these ponds may have surface water connections to local streams. See: Eric W Smith & Dave Wilford, *Water Quality, Stream Sediments, and Hydrology in the Atlin Placer Mining Area—A Pilot Study* (Smithers, BC: BC Ministry of Forests, Lands, and Natural Resource Operations, 2013 July 30), at p. 8 online.
- 6 For more on the importance of riparian areas, see the references at Calvin Sandborn, *Green Space and Growth: Conserving Natural Areas in BC Communities* (Victoria: Commission on Resources and Environment, 1996) at p. 91.
- 7 Cows and Fish, *Fact Sheet: Biodiversity and Riparian Areas: Life in the Green Zone* (February 2002) at p. 1 online: [cowsandfish.org/pdfs/biodiversity.pdf](http://cowsandfish.org/pdfs/biodiversity.pdf). On salmon's

cultural significance in British Columbia, see Tara Lamothe-Ammerlaan et al, "The New Gold Rush: Placer Mining in the Fraser Watershed," *BC Studies No.196: Perspectives on Gold Rush BC: Winter 2017/18* (2018 February 1) at p. 115.

- 8 Tara Lamothe-Ammerlaan et al, "The New Gold Rush: Placer Mining in the Fraser Watershed," *BC Studies No.196: Perspectives on Gold Rush BC: Winter 2017/18* (2018 February 1) at pp. 121-122; Seth Wenger, *A Review of the Scientific Literature on Riparian Buffer Width, Extent and Vegetation* (Athens: University of Georgia Institute of Ecology, March 1999) at p. 3 online: [www.memphremagog.org/FCKeditor/ckfinder/userfiles/files/Centre\\_de\\_documents/EN/Review-scientific-literature.pdf](http://www.memphremagog.org/FCKeditor/ckfinder/userfiles/files/Centre_de_documents/EN/Review-scientific-literature.pdf); Calvin Sandborn, *Green Space and Growth: Conserving Natural Areas in BC Communities* (Victoria: Commission on Resources and Environment, 1996) at p. 91.
- 9 Bruce Cohen, *Cohen Commission of Inquiry into the Decline of Sockeye Salmon in the Fraser River—final report* (Ottawa: Privy Council of Canada, October 2012) at volume 3, p. 45 online: [http://publications.gc.ca/collections/collection\\_2012/bcp-pco/CP32-93-2012-3-eng.pdf](http://publications.gc.ca/collections/collection_2012/bcp-pco/CP32-93-2012-3-eng.pdf).
- 10 Department of Fisheries and Oceans Canada, "Effects of Sediment on Fish and Their Habitat: Placer Mining Yukon Territory" *Habitat Status Report 2000/01 E* (January 2000) at p. 7 online: <http://www.dfo-mpo.gc.ca/Library/255660.pdf>.
- 11 Bruce I Cohen, *Cohen Commission of Inquiry into the Decline of Sockeye Salmon in the Fraser River - final report* (Ottawa: Privy Council of Canada, October 2012) at volume 2, p. 104 online: [http://publications.gc.ca/collections/collection\\_2012/bcp-pco/CP32-93-2012-3-eng.pdf](http://publications.gc.ca/collections/collection_2012/bcp-pco/CP32-93-2012-3-eng.pdf).
- 12 Yukon Conservation Society, "Fish Are Worth Their Weight in Gold: A Review of The Effectiveness of the Yukon Placer Authorization" (2002) at p. 7, cited in Fair Mining Collaborative, *Stirring Up the Sentiment: An Overview of Placer Mining in British Columbia* (September 2016) [unpublished draft report, on file with the University of Victoria Environmental Law Centre] at p. 19.
- 13 Seakem Group Ltd, "Yukon Placer Mining Study: Vol 1 Executive Summary" (Sidney, BC: Yukon Placer Mining Implementation Review Committee, 1992), cited in Ian K Birtwell, *Canadian Stock Assessment Secretariat Document 99/139: The Effects of Sediment on Fish and their Habitat* (West Vancouver: Canada, Department of Fisheries and Oceans, 1999) at p. 24 online: [www.dfo-mpo.gc.ca/Library/240698.pdf](http://www.dfo-mpo.gc.ca/Library/240698.pdf).
- 14 Tara Lamothe-Ammerlaan et al, "The New Gold Rush: Placer Mining in the Fraser Watershed," *BC Studies No.196: Perspectives on Gold Rush BC: Winter 2017/18* (2018 February 1) at pp. 121-124.

- 15 Michelle Arcand and Joanne McLeod, *Cariboo Region Placer Mine Inspection Report*" (BC Ministry of Forests, Lands and Natural Resource Operations, December 2011) in FOI Request—FNR-2012-00238, Response Package at part 4, p. 7 online: [docs.openinfo.gov.bc.ca/D10015613A\\_Response\\_Package\\_FNR-2012-00238.PDF](https://docs.openinfo.gov.bc.ca/D10015613A_Response_Package_FNR-2012-00238.PDF).
- 16 Michelle Arcand and Joanne McLeod, *Cariboo Region Placer Mine Inspection Report*" (BC Ministry of Forests, Lands and Natural Resource Operations, December 2011) in FOI Request—FNR-2012-00238, Response Package at part 4, p. 15.
- 17 See, e.g. Michelle Arcand and Joanne McLeod, *Cariboo Region Placer Mine Inspection Report*" (BC Ministry of Forests, Lands and Natural Resource Operations, December 2011) in FOI Request—FNR-2012-00238, Response Package at part 4, p. 10 online: [docs.openinfo.gov.bc.ca/D10015613A\\_Response\\_Package\\_FNR-2012-00238.PDF](https://docs.openinfo.gov.bc.ca/D10015613A_Response_Package_FNR-2012-00238.PDF).
- 18 Michelle Arcand and Joanne McLeod, *Cariboo Region Placer Mine Inspection Report*" (BC Ministry of Forests, Lands and Natural Resource Operations, December 2011) in FOI Request—FNR-2012-00238, Response Package at part 4, at pp. 5-6; also see s. 1(1) of the *Riparian Areas Regulation* s 1(1) and s. 47 of the *Forest Planning and Practices Regulation*. Note that the urban development setback can be reduced pursuant to professional studies that show that closer development will not be harmful to stream habitat.
- 19 BC lacks a legislated riparian setback requirement for placer mines. Although a 1997 inter-departmental MOU established a "standard reserve zone" of 10m for placer mining activity, this 10m setback has more recently been characterized as a mere policy requirement, or "something more akin to a word of mouth practice among placer miners". An April 2016 Mineral Titles Branch 'Information Update' to placer miners included the 10m setback requirement, but the document was removed from the Branch website in fall 2017. If the setback requirement is still government policy, it is unclear which forms of placer mining are supposed to comply with it, if or how prospective placer miners are being notified, and whether it is being enforced. See Fair Mining Collaborative, *The Path to Zero Failures: Health, Safety and Reclamation Code Review* (2015) at p. 9; Michelle Arcand and Joanne McLeod, *Cariboo Region Placer Mine Inspection Report*" (BC Ministry of Forests, Lands and Natural Resource Operations, December 2011) in FOI Request—FNR-2012-00238, Response Package at part 4, p. 8; Taku River Tlingit First Nation et al, *Atlin Placer Mining Best Management Practices Guidebook* (June 2014) at p. 25; British Columbia, Mineral Titles Branch, "Information Update No 38—Acceptable Practices for Placer Hand Mining in British Columbia" (2016 April 12) at pp. 1-2, revised 2017 March 29, removed fall 2017, archived online: <https://web.archive.org/web/20170707004040/http://www2.gov.bc.ca:80/gov/content/industry/mineral-exploration-mining/mineral-titles/news-notice-announcements/information-updates>; phone call, Renata Colwell with Tracy Martin Mineral Lands Administrator, Ministry of Energy, Mines & Petroleum Resources (2018 February 1).

- 20 Michelle Arcand and Joanne McLeod, *Cariboo Region Placer Mine Inspection Report*" (BC Ministry of Forests, Lands and Natural Resource Operations, December 2011) in FOI Request—FNR-2012-00238, Response Package at part 4, p. 5 online: [docs.openinfo.gov.bc.ca/D10015613A\\_Response\\_Package\\_FNR-2012-00238.PDF](https://docs.openinfo.gov.bc.ca/D10015613A_Response_Package_FNR-2012-00238.PDF).
- 21 See, e.g. Daniel Marshall, *Claiming the Land: British Columbia and the Making of a New El Dorado* (Ronsdale Press, June 2018). On the devastating impact of the 1862 smallpox epidemic, see Joshua Ostroff, "How a smallpox epidemic forged modern British Columbia," *Macleans* (2017 August 1) online: [www.macleans.ca/news/canada/how-a-smallpox-epidemic-forged-modern-british-columbia/](http://www.macleans.ca/news/canada/how-a-smallpox-epidemic-forged-modern-british-columbia/).
- 22 Fair Mining Collaborative, *The New Gold Rush: Placer Mining in the Fraser Watershed* (April 2017) at p. 7 online: <http://www.fairmining.ca/wp-content/uploads/2018/03/NewGoldRush.pdf>.
- 23 Tara Lamothe-Ammerlaan et al, "The New Gold Rush: Placer Mining in the Fraser Watershed," *BC Studies No.196: Perspectives on Gold Rush BC: Winter 2017/18* (2018 February 1) at p. 126; BC Ministry of Energy and Mines, *Health, Safety and Reclamation Code for Mines in British Columbia* (Victoria: June 2017), s 1.3.1, online: <https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/health-safety/health-safety-and-reclamation-code-for-mines-in-british-columbia>.
- 24 Fair Mining Collaborative, *The New Gold Rush: Placer Mining in the Fraser Watershed* (April 2017) at p. 7 online: <http://www.fairmining.ca/wp-content/uploads/2018/03/NewGoldRush.pdf>.
- 25 Fair Mining Collaborative, *The Path to Zero Failures: Health, Safety and Reclamation Code Review* (2015) at p. 36 online: [https://www.fairmining.ca/wp-content/uploads/2016/01/The\\_Path\\_To\\_Zero\\_Failures.pdf](https://www.fairmining.ca/wp-content/uploads/2016/01/The_Path_To_Zero_Failures.pdf).
- 26 Tara Lamothe-Ammerlaan et al, "The New Gold Rush: Placer Mining in the Fraser Watershed," *BC Studies No.196: Perspectives on Gold Rush BC: Winter 2017/18* (2018 February 1) at p. 133. Section 43 of the *Mineral Tenure Act* required any placer miner wishing to convert a claim into a lease to obtain an environmental assessment certificate, but this provision was repealed in 2003. *Mineral Tenure Act*, RSBC 1996, c 292, s 43, as repealed by *Energy and Mines Statute Amendment Act*, SBC 2003, c 1, s 5. See Fair Mining Collaborative, *Stirring Up the Sentiment: An Overview of Placer Mining in British Columbia* (September 2016) [unpublished draft report, on file with the University of Victoria Environmental Law Centre] at p. 15.
- 27 *Reviewable Projects Regulation*, BC Reg 370/2002, s 8 & Table 6, s 1, 2, 4.

- 28 Fair Mining Collaborative, *BC Placer Mining: High Environmental Impacts vs Low Economic Return* (March 2017) at pp. 8-9 online: [www.fairmining.ca/wp-content/uploads/2018/03/BCPlacer\\_Environment\\_Economic.pdf](http://www.fairmining.ca/wp-content/uploads/2018/03/BCPlacer_Environment_Economic.pdf).
- 29 Fair Mining Collaborative, *The New Gold Rush: Placer Mining in the Fraser Watershed* (April 2017) at p. 10 online: <http://www.fairmining.ca/wp-content/uploads/2018/03/NewGoldRush.pdf>; Yukon Environmental and Socio-economic Assessment Board, "Project Statistics" (2014 August 1) online: [www.yesab.ca/about-yesab/assessment-statistics/](http://www.yesab.ca/about-yesab/assessment-statistics/).
- 30 *Yukon Environmental and Socio-economic Assessment Act*, SC 2003, c 7, s 42(1)(d).
- 31 Auditor General of British Columbia, *An Audit of Compliance and Enforcement of the Mining Sector*, May 2016 (Victoria: Office of the Auditor General, 2016) at p. 6.
- 32 Fair Mining Collaborative, *BC Placer Mining: High Environmental Impacts vs Low Economic Return* (March 2017) at pp. 7-9 online: [www.fairmining.ca/wp-content/uploads/2018/03/BCPlacer\\_Environment\\_Economic.pdf](http://www.fairmining.ca/wp-content/uploads/2018/03/BCPlacer_Environment_Economic.pdf).
- 33 Data from FOI Request - EGM-2017-70745, online: [www2.gov.bc.ca/enSearch/detail?id=7AFDBC16F15F42E289E9F7DDBoF8oC4o&recorduid=EGM-2017-70745&keyword=EGM-2017-70745](http://www2.gov.bc.ca/enSearch/detail?id=7AFDBC16F15F42E289E9F7DDBoF8oC4o&recorduid=EGM-2017-70745&keyword=EGM-2017-70745); Fair Mining Collaborative, "Additional comments on distribution and frequency of placer mine inspections" (2017) [unpublished draft report, on file with the University of Victoria Environmental Law Centre].
- 34 Michelle Arcand and Joanne McLeod, *Cariboo Region Placer Mine Inspection Report*" (BC Ministry of Forests, Lands and Natural Resource Operations, December 2011) in FOI Request—FNR-2012-00238, Response Package at part 4, p. 5 online: [docs.openinfo.gov.bc.ca/D10015613A\\_Response\\_Package\\_FNR-2012-00238.PDF](http://docs.openinfo.gov.bc.ca/D10015613A_Response_Package_FNR-2012-00238.PDF).
- 35 Michelle Arcand and Joanne McLeod, *Cariboo Region Placer Mine Inspection Report*" (BC Ministry of Forests, Lands and Natural Resource Operations, December 2011) in FOI Request—FNR-2012-00238, Response Package at part 4, at pp. 10-11.
- 36 This could include strict liability penalties, the automatic denial of permits if a miner has 2 or more violations in the last 3 years, and possible incarceration for repeat offenders. Fair Mining Collaborative, *Stirring Up the Sentiment: An Overview of Placer Mining in British Columbia* (September 2016) [unpublished draft report, on file with the University of Victoria Environmental Law Centre] at p. 4.
- 37 Fair Mining Collaborative, *BC Placer Mining: High Environmental Impacts vs Low Economic Return* (March 2017) at p. 5 online: [www.fairmining.ca/wp-content/uploads/2018/03/BCPlacer\\_Environment\\_Economic.pdf](http://www.fairmining.ca/wp-content/uploads/2018/03/BCPlacer_Environment_Economic.pdf); Michelle Arcand and Joanne McLeod, *Cariboo Region Placer Mine Inspection Report*" (BC Ministry of Forests, Lands

and Natural Resource Operations, December 2011) in FOI Request—FNR-2012-00238, Response Package at part 4, p. 17 online: [docs.openinfo.gov.bc.ca/D10015613A\\_Response\\_Package\\_FNR-2012-00238.PDF](https://docs.openinfo.gov.bc.ca/D10015613A_Response_Package_FNR-2012-00238.PDF).

- 38 Fair Mining Collaborative, *Lost Creeks: the Atlin Watershed and Placer Mine Reclamation* (2017) [unpublished draft report, on file with the University of Victoria Environmental Law Centre] at pp. 1, 2, 14.
- 39 Fair Mining Collaborative, *Lost Creeks: the Atlin Watershed and Placer Mine Reclamation* (2017) [unpublished draft report, on file with the University of Victoria Environmental Law Centre] at pp. 1, 8, 13.
- 40 Currently, security amounts are set in an "amount and form" acceptable to the Chief Inspector of Mines; *Mines Act*, RSBC 1996, c 293, s 10(5).
- 41 *Mines Act*, RSBC 1996, c 293, s 10(4); Fair Mining Collaborative, *Lost Creeks: the Atlin Watershed and Placer Mine Reclamation* (2017) [unpublished draft report, on file with the University of Victoria Environmental Law Centre] at p. 8; D Howe, T Demchuk, and A Rollo, *BC Mines Act Permitting: Update on Government Structure, Roles, Responsibilities and Requirements* (Victoria: BC Ministry of Energy and Mines, 2012) at p. 3 online: <https://open.library.ubc.ca/media/download/pdf/59367/1.0042628/1>.
- 42 In early 2018, MEM introduced a 'reclamation calculator' as a policy tool to assist the Chief Inspector of Mines and inspector-delegates in calculating security amounts for mining proponents—including placer miners. The calculator was designed to ensure that reclamation amounts were consistent between regions, to provide a realistic and defensible estimate of costs, and to increase mining proponents' knowledge regarding reclamation standards.<sup>#</sup> However, MEMPR also made clear that the calculator was not intended "to fetter the decision" of the Inspector of Mines and inspector-delegates in setting security reclamation amounts.
- 43 World Health Organization, "Mercury and Health" (2017 March 31) online: [www.who.int/mediacentre/factsheets/fs361/en/](http://www.who.int/mediacentre/factsheets/fs361/en/).
- 44 Fair Mining Collaborative, *Stirring Up the Sentiment: An Overview of Placer Mining in British Columbia* (September 2016) [unpublished draft report, on file with the University of Victoria Environmental Law Centre] at p. 22; BC Ministry of Forests, Lands and Natural Resource Operations, "2017-2019 Freshwater Fishing Regulations Synopsis - Region 5—Cariboo" (2017) at p. 51 online: [www.env.gov.bc.ca/fw/fish/regulations/docs/1719/fishing\\_synopsis\\_2017-19\\_region5.pdf](http://www.env.gov.bc.ca/fw/fish/regulations/docs/1719/fishing_synopsis_2017-19_region5.pdf).
- 45 Fair Mining Collaborative, *BC Placer Mining: High Environmental Impacts vs Low Economic Return* (March 2017) at p. 7 online: [www.fairmining.ca/wp-content/uploads/2018/03/BCPlacer\\_Environment\\_Economic.pdf](http://www.fairmining.ca/wp-content/uploads/2018/03/BCPlacer_Environment_Economic.pdf); Marcello M Veiga & J A Meech,



- "A Brief History of Amalgamation Practices in the Americas" (Paper delivered at the 16<sup>th</sup> Brazilian Symposium on Ore Processing and Hydrometallurgy, Rio de Janeiro, 1995 September 17-22), vol 1, at 581-594.
- 46 Fair Mining Collaborative, *BC Placer Mining: High Environmental Impacts vs Low Economic Return* (March 2017) at pp. 6-7 online: [www.fairmining.ca/wp-content/uploads/2018/03/BCPlacer\\_Environment\\_Economic.pdf](http://www.fairmining.ca/wp-content/uploads/2018/03/BCPlacer_Environment_Economic.pdf).
- 47 Fair Mining Collaborative, *Stirring Up the Sentiment: An Overview of Placer Mining in British Columbia* (September 2016) [unpublished draft report, on file with the University of Victoria Environmental Law Centre] at p. 21; Sophia C Johannessen, Robie W MacDonald & K Magnus Eek, "Historical Trends in Mercury Sedimentation and Mixing in the Strait of Georgia, Canada," *Environmental Science & Technology* 39:12 (2005) at p. 4361.
- 48 Fair Mining Collaborative, *BC Placer Mining: High Environmental Impacts vs Low Economic Return* (March 2017) at pp. 4-5 online: [www.fairmining.ca/wp-content/uploads/2018/03/BCPlacer\\_Environment\\_Economic.pdf](http://www.fairmining.ca/wp-content/uploads/2018/03/BCPlacer_Environment_Economic.pdf); *Placer Mining Waste Control Regulation*, BC Reg 107/89, ss 2-3; Fair Mining Collaborative, *Lost Creeks: the Atlin Watershed and Placer Mine Reclamation* (2017) [unpublished draft report, on file with the University of Victoria Environmental Law Centre] at p. 5.
- 49 Fair Mining Collaborative, *BC Placer Mining: High Environmental Impacts vs Low Economic Return* (March 2017) at p. 5 online: [www.fairmining.ca/wp-content/uploads/2018/03/BCPlacer\\_Environment\\_Economic.pdf](http://www.fairmining.ca/wp-content/uploads/2018/03/BCPlacer_Environment_Economic.pdf); Eric W Smith & Dave Wilford, *Water Quality, Stream Sediments, and Hydrology in the Atlin Placer Mining Area — A Pilot Study* (Smithers, BC: BC Ministry of Forests, Lands, and Natural Resource Operations, 2013).
- 50 Fair Mining Collaborative, *Lost Creeks: the Atlin Watershed and Placer Mine Reclamation* (2017) [unpublished draft report, on file with the University of Victoria Environmental Law Centre] at p. 6; Eric W Smith & Dave Wilford, *Water Quality, Stream Sediments, and Hydrology in the Atlin Placer Mining Area — A Pilot Study* (Smithers, BC: BC Ministry of Forests, Lands, and Natural Resource Operations, 2013) at pp. 58-72.
- 51 *Placer Mining Waste Control Regulation*, BC Reg 107/89, s 3(c)(i).
- 52 The growing popularity of placer jade mining in BC is likely due in part to rising jade prices, but may also be influenced by Discovery Channel Canada's popular reality TV show, *Jade Fever*, which covers placer and hard rock jade mining operations in northern BC, and is now in its fourth season. See Jeff Desjardins, "The Rush For Jade in British Columbia," *Visual Capitalist* (2015 September 23) online: : [www.visualcapitalist.com/the-rush-for-jade-in-british-columbia/](http://www.visualcapitalist.com/the-rush-for-jade-in-british-columbia/); Discovery, "Jade Fever," (2018) online: [www.discovery.ca/Shows/Jade-Fever](http://www.discovery.ca/Shows/Jade-Fever).
- 53 Pacific Bay Minerals, "BC Jade," online: [www.pacificbayminerals.com/properties/bc-jade/](http://www.pacificbayminerals.com/properties/bc-jade/).