

**Valentine Gold Project:
Amendment to the Environmental
Impact Statement**



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Table of Contents

PART 1	EIS AMENDMENT SUMMARY.....	1
	ATTACHMENT A DETAILED TABLE OF CONCORDANCE	
PART 2	RESPONSES TO REGULATORY AND PUBLIC COMMENTS	
	RESPONSE TO DHCS-01.....	1
	RESPONSE TO DHCS-02.....	2
	RESPONSE TO DHCS-03.....	3
	RESPONSE TO DHCS-04.....	4
	RESPONSE TO DHCS-05.....	7
	RESPONSE TO DHCS-06.....	9
	RESPONSE TO DHCS-07.....	10
	RESPONSE TO DHCS-08.....	11
	RESPONSE TO DHCS-09.....	12
	RESPONSE TO DIET-01.....	13
	RESPONSE TO DIET-02.....	14
	RESPONSE TO DIET-03.....	15
	RESPONSE TO DIET-04.....	16
	RESPONSE TO DIET-05.....	17
	RESPONSE TO DIET-06.....	26
	RESPONSE TO DIET-07.....	28
	RESPONSE TO DIET-08.....	30
	RESPONSE TO DIET-09.....	38
	RESPONSE TO DIET-10.....	42
	RESPONSE TO DIET-11.....	45
	RESPONSE TO DIET-12.....	73
	RESPONSE TO DTCAI-01.....	75
	RESPONSE TO ECC-01.....	77
	RESPONSE TO ECC-02.....	78
	RESPONSE TO ECC-03.....	79



RESPONSE TO ECC-04	80
RESPONSE TO ECC-05	85
RESPONSE TO ECC-06	87
RESPONSE TO ECC-07	89
RESPONSE TO ECC-08	93
RESPONSE TO ECC-09	94
RESPONSE TO ECC-10	95
RESPONSE TO ECC-11	96
RESPONSE TO ECC-12	98
RESPONSE TO ECC-13	99
RESPONSE TO ECC-14	100
RESPONSE TO ECC-15	102
RESPONSE TO ECC-16	104
RESPONSE TO ECC-17	105
RESPONSE TO ECC-18	107
RESPONSE TO ECC-19	113
RESPONSE TO ECC-20	114
RESPONSE TO ECC-21	119
RESPONSE TO ECC-22	120
RESPONSE TO ECC-23	124
RESPONSE TO ECC-24	127
RESPONSE TO ECC-25	128
RESPONSE TO ECC-26	129
RESPONSE TO ECC-27	130
RESPONSE TO ECC-28	131
RESPONSE TO ECC-29	132
RESPONSE TO ECC-30	133
RESPONSE TO ECC-31	135
RESPONSE TO ECC-32	136
RESPONSE TO ECC-33	138
RESPONSE TO ECC-34	139



RESPONSE TO ECC-35	142
RESPONSE TO ECC-36	145
RESPONSE TO ECC-37	146
RESPONSE TO ECC-38	147
RESPONSE TO ECC-39	148
RESPONSE TO ECC-40	149
RESPONSE TO ECC-41	150
RESPONSE TO ECC-42	151
RESPONSE TO ECC-43	153
RESPONSE TO ECC-44	155
RESPONSE TO ECC-45	157
RESPONSE TO ECC-46	158
RESPONSE TO ECC-47	160
RESPONSE TO ECC-48	162
RESPONSE TO ECC-49	165
RESPONSE TO ECC-50	166
RESPONSE TO ECC-51	168
RESPONSE TO ECC-52	169
RESPONSE TO ECC-53	170
RESPONSE TO ECC-54	171
RESPONSE TO ECC-55	173
RESPONSE TO ECC-56	174
RESPONSE TO ECC-57	175
RESPONSE TO ECC-58	177
RESPONSE TO ECC-59	178
RESPONSE TO ECC-60	180
RESPONSE TO ECC-61	181
RESPONSE TO ECC-62	182
RESPONSE TO ECC-63	184
RESPONSE TO ECC-64	185
RESPONSE TO ECC-65	187



VALENTINE GOLD PROJECT: AMENDMENT TO THE ENVIRONMENTAL IMPACT STATEMENT

RESPONSE TO ECC-66	188
RESPONSE TO ECC-67	189
RESPONSE TO ECC-68	190
RESPONSE TO ECC-69	192
RESPONSE TO ECC-70	193
RESPONSE TO ECC-71	194
RESPONSE TO ECC-72	196
RESPONSE TO ECC-73	202
RESPONSE TO ECC-74	205
RESPONSE TO ECC-75	206
RESPONSE TO ECC-76	207
RESPONSE TO ECC-77	209
RESPONSE TO ECC-78	211
RESPONSE TO OSW-01	213
RESPONSE TO OSW-02	214
RESPONSE TO FFA-01	215
RESPONSE TO FFA-02	217
RESPONSE TO FFA-03	226
RESPONSE TO FFA-04	228
RESPONSE TO FFA-05	230
RESPONSE TO FFA-06	231
RESPONSE TO FFA-07	233
RESPONSE TO FFA-08	234
RESPONSE TO FFA-09	235
RESPONSE TO FFA-10	236
RESPONSE TO FFA-11	237
RESPONSE TO FFA-12	238
RESPONSE TO FFA-13	240
RESPONSE TO FFA-14	241
RESPONSE TO FFA-15	242
RESPONSE TO FFA-16	243



RESPONSE TO FFA-17	244
RESPONSE TO FFA-18	246
RESPONSE TO FFA-19	247
RESPONSE TO FFA-20	248
RESPONSE TO FFA-21	251
RESPONSE TO FFA-22	252
RESPONSE TO FFA-23	253
RESPONSE TO FFA-24	254
RESPONSE TO FFA-25	256
RESPONSE TO FFA-26	259
RESPONSE TO FFA-27	260
RESPONSE TO FFA-28	261
RESPONSE TO FFA-29	262
RESPONSE TO FFA-30	263
RESPONSE TO FFA-31	264
RESPONSE TO FFA-32	266
RESPONSE TO FFA-33	267
RESPONSE TO FFA-34	268
RESPONSE TO FFA-35	269
RESPONSE TO FFA-36	271
RESPONSE TO FFA-37	272
RESPONSE TO FFA-38	273
RESPONSE TO FFA-39	274
RESPONSE TO FFA-40	275
RESPONSE TO FFA-41	276
RESPONSE TO FFA-42	278
RESPONSE TO FFA-43	279
RESPONSE TO FFA-44	280
RESPONSE TO FFA-45	281
RESPONSE TO FFA-46	282
RESPONSE TO FFA-47	283



RESPONSE TO FFA-48	284
RESPONSE TO FFA-49	285
RESPONSE TO FFA-50	286
RESPONSE TO FFA-51	288
RESPONSE TO FFA-52	289
RESPONSE TO FFA-53	291
RESPONSE TO FFA-54	292
RESPONSE TO FFA-55	293
RESPONSE TO FFA-56	294
RESPONSE TO FFA-57	295
RESPONSE TO FFA-58	296
RESPONSE TO FFA-59	297
RESPONSE TO FFA-60	298
RESPONSE TO FFA-61	299
RESPONSE TO FFA-62	305
RESPONSE TO FFA-63	307
RESPONSE TO FFA-64	308
RESPONSE TO FFA-65	309
RESPONSE TO FFA-66	310
RESPONSE TO FFA-67	311
RESPONSE TO FFA-68	313
RESPONSE TO FFA-69	314
RESPONSE TO FFA-70	315
RESPONSE TO FFA-71	316
RESPONSE TO FFA-72	317
RESPONSE TO FFA-73	318
RESPONSE TO FFA-74	319
RESPONSE TO FFA-75	320
RESPONSE TO FFA-76	321
RESPONSE TO FFA-77	322
RESPONSE TO FFA-78	323



RESPONSE TO FFA-79	324
RESPONSE TO FFA-80	325
RESPONSE TO FFA-81	326
RESPONSE TO FFA-82	327
RESPONSE TO FFA-83	328
RESPONSE TO FFA-84	329
RESPONSE TO FFA-85	330
RESPONSE TO FFA-86	331
RESPONSE TO FFA-87	332
RESPONSE TO FFA-88	333
RESPONSE TO FFA-89	334
RESPONSE TO FFA-90	335
RESPONSE TO FFA-91	336
RESPONSE TO FFA-92	337
RESPONSE TO FFA-93	338
RESPONSE TO FFA-94	339
RESPONSE TO FFA-95	340
RESPONSE TO FFA-96	341
RESPONSE TO DFO-01	342
RESPONSE TO ECCC-01	344
RESPONSE TO ECCC-02	347
RESPONSE TO ECCC-03	348
RESPONSE TO ECCC-04	352
RESPONSE TO ECCC-05	356
RESPONSE TO ECCC-06	357
RESPONSE TO ECCC-07	361
RESPONSE TO ECCC-08	365
RESPONSE TO ECCC-09	367
RESPONSE TO ECCC-10	373
RESPONSE TO ECCC-11	380
RESPONSE TO ECCC-12	382



RESPONSE TO ECCC-13.....	391
RESPONSE TO ECCC-14.....	394
RESPONSE TO ECCC-15.....	397
RESPONSE TO ECCC-16.....	401
RESPONSE TO ECCC-17.....	403
RESPONSE TO ECCC-18.....	406
RESPONSE TO ECCC-19.....	408
RESPONSE TO ECCC-20.....	409
RESPONSE TO ECCC-21.....	411
RESPONSE TO ECCC-22.....	412
RESPONSE TO ECCC-23.....	414
RESPONSE TO ECCC-24.....	415
RESPONSE TO ECCC-25.....	417
RESPONSE TO ECCC-26.....	418
RESPONSE TO ECCC-27.....	419
RESPONSE TO ECCC-28.....	420
RESPONSE TO ECCC-29.....	421
RESPONSE TO ECCC-30.....	422
RESPONSE TO ECCC-31.....	425
RESPONSE TO ECCC-32.....	427
RESPONSE TO ECCC-33.....	429
RESPONSE TO ECCC-34.....	431
RESPONSE TO ECCC-35.....	432
RESPONSE TO ECCC-36.....	433
RESPONSE TO ECCC-37.....	434
RESPONSE TO HC-01.....	436
RESPONSE TO HC-02.....	440
RESPONSE TO HC-03.....	442
RESPONSE TO HC-04.....	445
RESPONSE TO HC-05.....	447
RESPONSE TO HC-06.....	449



RESPONSE TO HC-07.....	452
RESPONSE TO HC-08.....	454
RESPONSE TO HC-09.....	456
RESPONSE TO HC-10.....	458
RESPONSE TO HC-11.....	464
RESPONSE TO HC-12.....	466
RESPONSE TO HC-13.....	470
RESPONSE TO HC-14.....	474
RESPONSE TO HC-15.....	483
RESPONSE TO HC-16.....	488
RESPONSE TO HC-17.....	489
RESPONSE TO HC-18.....	494
RESPONSE TO HC-19.....	499
RESPONSE TO HC-20.....	501
RESPONSE TO HC-21.....	503
RESPONSE TO HC-22.....	505
RESPONSE TO HC-23.....	507
RESPONSE TO HC-24.....	509
RESPONSE TO HC-25.....	511
RESPONSE TO TC-01.....	513
RESPONSE TO TC-02.....	515
RESPONSE TO PC-01.....	516
RESPONSE TO PC-02.....	520
RESPONSE TO PC-03.....	522
RESPONSE TO PC-04.....	523
RESPONSE TO PC-05.....	525
RESPONSE TO PC-06.....	527
RESPONSE TO PC-07.....	529
RESPONSE TO PC-08.....	531
RESPONSE TO PC-09.....	533
RESPONSE TO PC-10.....	535



RESPONSE TO PC-11.....	537
RESPONSE TO PC-12.....	539
RESPONSE TO PC-13.....	541
RESPONSE TO PC-14.....	543
RESPONSE TO PC-15.....	546
RESPONSE TO PC-16.....	548
RESPONSE TO PC-17.....	549
RESPONSE TO PC-18.....	551
RESPONSE TO PC-19.....	553
RESPONSE TO PC-20.....	554
RESPONSE TO PC-21.....	555
RESPONSE TO PC-22.....	557
RESPONSE TO PC-23.....	558
RESPONSE TO PC-24.....	560
RESPONSE TO PC-25.....	562
RESPONSE TO PC-26.....	563
RESPONSE TO PC-27.....	564
RESPONSE TO PC-28.....	566
RESPONSE TO PC-29.....	568
RESPONSE TO PC-30.....	569
RESPONSE TO PC-31.....	570
RESPONSE TO PC-32.....	571
RESPONSE TO PC-33.....	573
RESPONSE TO PC-34.....	576
RESPONSE TO PC-35.....	577
RESPONSE TO PC-36.....	578
RESPONSE TO PC-37.....	580
RESPONSE TO PC-38.....	581
RESPONSE TO PC-39.....	582
RESPONSE TO PC-40.....	583
RESPONSE TO PC-41.....	584



RESPONSE TO PC-42.....	585
RESPONSE TO PC-43.....	586
RESPONSE TO PC-44.....	587
RESPONSE TO PC-45.....	588
RESPONSE TO PC-46.....	589
RESPONSE TO PC-47.....	591
RESPONSE TO PC-48.....	592
RESPONSE TO PC-49.....	594
RESPONSE TO PC-50.....	595
RESPONSE TO PC-51.....	597
RESPONSE TO PC-52.....	599
RESPONSE TO PC-53.....	601
RESPONSE TO PC-54.....	602
RESPONSE TO PC-55.....	604
RESPONSE TO PC-56.....	605
RESPONSE TO PC-57.....	606
RESPONSE TO PC-58.....	607
RESPONSE TO PC-59.....	609
RESPONSE TO PC-60.....	610
RESPONSE TO PC-61.....	611
RESPONSE TO PC-62.....	612
RESPONSE TO PC-63.....	613
RESPONSE TO PC-64.....	614
RESPONSE TO PC-65.....	615
RESPONSE TO PC-66.....	616
RESPONSE TO PC-67.....	617
RESPONSE TO PC-68.....	618
RESPONSE TO PC-69.....	620
RESPONSE TO PC-70.....	621
RESPONSE TO PC-71.....	622
RESPONSE TO PC-72.....	623



RESPONSE TO PC-73.....	624
RESPONSE TO PC-74.....	625
RESPONSE TO PC-75.....	626
RESPONSE TO PC-76.....	630
RESPONSE TO PC-77.....	631
RESPONSE TO PC-78.....	633
RESPONSE TO PC-79.....	635
RESPONSE TO PC-80.....	637
RESPONSE TO PC-81.....	638
RESPONSE TO PC-82.....	642
RESPONSE TO PC-83.....	644
RESPONSE TO PC-84.....	645
RESPONSE TO PC-85.....	648
RESPONSE TO PC-86.....	649
RESPONSE TO PC-87.....	651
RESPONSE TO PC-88.....	653
RESPONSE TO PC-89.....	657
RESPONSE TO PC-90.....	658
RESPONSE TO PC-91.....	659
RESPONSE TO PC-92.....	660
RESPONSE TO PC-93.....	665
RESPONSE TO PC-94.....	666
RESPONSE TO PC-95.....	667
RESPONSE TO PC-96.....	668
RESPONSE TO PC-97.....	669
RESPONSE TO PC-98.....	670
RESPONSE TO PC-99.....	671



PART 3 APPENDICES

- Appendix A Human Health Risk Assessment**
- Appendix B ARD/ML Management Approach**
- Appendix C ARD Onset and Tables**
- Appendix D Summary of Packer Testing 2020, FS-Level Geotechnical Pit Design Program**
- Appendix E Hydrology Characterization Baseline Report**
- Appendix F Best Available Control Technology Report**
- Appendix G Caribou Supplemental Information Report**
- Appendix H Valentine Gold Project: 2020 Fish and Fish Habitat Data Report**
- Appendix I ECCC-08 Tables**
- Appendix J ECCC-08 Mapbook**



August 2021

PART 1

EIS Amendment Summary



VALENTINE GOLD PROJECT: AMENDMENT TO THE ENVIRONMENTAL IMPACT STATEMENT

August 2021

Marathon Gold Corporation (Marathon) proposes to develop an open pit gold mine near Valentine Lake, located in the central region of the Island of Newfoundland, southwest of the Town of Millertown, Newfoundland and Labrador (NL). The Valentine Gold Project (the Project) will consist primarily of two open pits, waste rock piles, crushing and stockpiling areas, conventional milling and processing facilities, a tailings management facility (TMF), and supporting infrastructure.

As part of the planning and regulatory approval for the Project, federal and provincial environmental assessment (EA) requirements were identified and included the following:

- On April 5, 2019, a document serving as a Project Description pursuant to the *Canadian Environmental Assessment Act*, 2012 (CEAA, 2012) was submitted to the Impact Assessment Agency of Canada (IAAC), previously known as the Canadian Environmental Assessment Agency. Based on a review of this document, IAAC determined that an EA would be required.
- On April 16, 2019, the same Project Description, serving as a registration document of an undertaking pursuant to the *NL Environmental Protection Act*, SNL 2002, cE-14.2 (NL EPA), was submitted to the provincial government for review. On June 21, 2019, the Minister of Environment and Climate Change (NLDECC) announced the Project would require the preparation of an Environmental Impact Statement (EIS), and a provincial Environmental Assessment Committee (EAC) was formed.
- Project-specific guidelines for the preparation of an EIS were issued by IAAC in July 2019 and final EIS Guidelines were issued by the EAC on behalf of the Minister of Environment and Climate Change in January 2020.

Although the two EA processes are not legislatively coordinated, a single EIS document was prepared to satisfy both processes. Marathon submitted the EIS to IAAC and the EAC on September 29, 2020.

The EIS was reviewed by federal and provincial regulators and opportunities to comment were provided to the public, as required by the NL EPA and CEAA, 2012. On February 10, 2021, Marathon received notification from the Minister of NLDECC that the EIS was deficient and was provided with comments on the EIS from the EAC and public. A total of 364 comments were received from the EAC and public respondents. These comments pertain to various issues and associated requests for clarification and information that were submitted by government departments and agencies, Indigenous groups, communities and stakeholder organizations and members of the public. Note that information requirements (IRs) were also received from IAAC; the IRs and Marathon's associated responses can be found on the Canadian Impact Assessment Registry at <https://iaac-aeic.gc.ca/050/evaluations/proj/80169>.

This document comprises an amendment to the EIS to address the comments received through the provincial EA process. An abbreviated table of concordance is provided in Table 1 to identify where the responses to EAC and public comments can be found. A detailed table of concordance is provided in Part 1 Attachment A, which details the comments received, with a corresponding response number (i.e., a number assigned by Marathon to each comment, for tracking and reference purposes).



August 2021

Table 1 Abbreviated Table of Concordance

Agency / Organization	Response #	Part 2 Page #
Department of Health and Community Services	DHCS-01 – DHCS-09	1-12
Department of Industry, Innovation and Technology	DIET-01 – DIET-12	13-74
Department of Tourism, Culture, Arts and Innovation	DTCAl-01	75-76
Department of Environment and Climate Change	ECC-01 – ECC-78	77-212
Office for the Status of Women	OSW-01 – OWS-02	213-214
Department of Fisheries, Forestry and Agriculture	FFA-01 – FFA-97	215-341
Department of Fisheries and Oceans Canada	DFO-01	342-343
Environment and Climate Change Canada	ECCC-01 – ECCC-37	344-435
Health Canada	HC-01 – HC-25	436-512
Transport Canada	TC-01 – TC-02	513-515
CPAWS	PC-01 – PC-16	516-548
Brian McLaren and Richard Huang	PC-17 – PC-32	549-572
Mining Watch Canada / J. Kuipers	PC-33 – PC-86	573-650
Atlantic Salmon Foundation	PC-87 – PC-90	651-658
Salmonid Association	PC-91 – PC-97	659-669
Residents	PC-98 – PC-99	670-671

Responses to regulatory and public comments can be found in Part 2 of this document and associated appendices found in Part 3. In an effort to clearly document the comments received, each comment was converted into a table format which includes:

- The agency / organization / party that made the comment
- Applicable section of the Provincial EIS Guidelines and EIS section number, if provided
- Context and rationale for the comment, if provided
- Specific comments, concerns or requests for information
- Marathon’s response

Primary issues raised by regulators and the public during EIS review include the following:

- Caribou:
 - Requests for clarification and additional information related to the assessment of Project effects on caribou, including related to caribou movement, sensory disturbance, zones of influence, calf mortality, and combined (i.e., within Project) and cumulative effects. To respond to the comments received, a Caribou Supplemental Information report (Part 3, Appendix G) was prepared to collate the supplemental information on baseline conditions, the environmental effects assessment, and mitigation and monitoring plans. A Caribou Alternative Migration Pathway Analysis (Attachment A in Appendix G) was also completed since the submission of the EIS. The information presented in these reports does not change the conclusion of the assessment in the EIS of a significant adverse effect on caribou, however it provides additional context for the effects assessment and the future implementation of mitigation measures and



VALENTINE GOLD PROJECT: AMENDMENT TO THE ENVIRONMENTAL IMPACT STATEMENT

August 2021

monitoring plans. Marathon is committed to working with regulators, Indigenous groups, and stakeholders to implement initial mitigation measures, undertake follow-up and monitoring activities, and adapt mitigation measures as required to avoid or reduce adverse Project effects on caribou.

- Water Resources:

- The Project is located at the headwaters of the Exploits River system, which provides important habitat for Atlantic salmon. Concerns have therefore been raised regarding the potential effects to water quality downstream of the Project and the potential for the Project to contribute to cumulative effects that could affect fish habitat. As indicated in the EIS and relevant responses in Part 2 of this Amendment, all mine effluent discharges will meet *Metal and Diamond Mining Effluent Regulations* (MDMER) limits. All discharges to the Exploits River system (i.e., discharges to Valentine Lake and Victoria River steadies) are located approximately 70 km upstream of the Exploits River, and these tributaries have significant assimilative capacity. An assimilative capacity study conducted as part of the EIS determined that within 300 m of all ultimate receivers, water quality would return to regulatory water quality guidelines or baseline conditions. Therefore, the Project is not expected to have any detectable effect or cumulative effect on downstream water quality, including in the Victoria River and Red Indian Lake, or the Exploits River. Similarly, the Project is not expected to have any detectable effect or cumulative effect on downstream water quality, including the Victoria Lake Reservoir or White Bear (Bay D'Espoir) Watershed.
- Prediction of, and proposed treatment of, Project effluent during rehabilitation and closure and post-closure were identified as a concern during regulatory and public review. Geochemical predictions indicate that some parameters are likely to exceed regulatory thresholds for closure, during the closure and rehabilitation period and post-closure. Thus, Marathon has proposed methods to reduce the amount of mine contact water and implement passive treatment during rehabilitation and closure, that will maintain drainage parameters below regulatory thresholds post-closure.
- Regulatory and public reviewers requested additional information on the potential effects of Project discharges on receiving water sediment quality. Marathon conducted an assessment of effluent sediment quality over the operating period and determined that sediment accumulations will be negligible (in the order of millimeters), and that the quality of sediment in Project effluent is expected to be better than that measured in baseline sediments.
- Additional information was also requested on potential effects of flooding or dam breach conditions on access to traditional foods (for Indigenous groups) such as berries, herbs and medicinal plants. Sedimentation ponds will attenuate flooding to baseline or lesser peak flow conditions. A potential dam breach from a sedimentation pond would release limited sediment and be short duration flooding events. Thus, no long-term effects are anticipated to food, berries, herbs or medicinal plants. Additionally, potential effects would be limited to the Project Area, in which access for traditional harvesting will be restricted throughout the operational life of the Project.



VALENTINE GOLD PROJECT: AMENDMENT TO THE ENVIRONMENTAL IMPACT STATEMENT

August 2021

- Dam Infrastructure / Tailings Management Facility:
 - Clarification on the design considerations for the TMF related to stability, seepage and geohazards was requested from regulatory and public reviewers. Since the submission of the EIS, additional site investigations have been conducted which confirm the parameters used in design as they relate to foundation conditions (glacial till or bedrock), and seepage through the base of the TMF and dam (hydraulic testing of the glacial till and bedrock, and fault structures).
 - Additional information was requested on the physical and chemical characteristics of the tailings. Supplemental information is provided regarding the tailings characteristics as they relate to tailings deposition within the TMF and the potential downstream water quality effects during operation, closure and post-closure.
 - Additional information / clarification was requested as it relates to the potential for, and effects of, a dam breach. Supplemental information and/or clarification regarding dam stability, tailings pond management, design hydrological events, and the potential downstream effects of a release of effluent or a dam breach are provided.
- Acid Rock Drainage/Metal Leaching
 - Supplemental information was requested on potential effects related to potentially acid-generating rock to be mined from the open pits. Ongoing and future test work will be incorporated into the existing data and assessment to confirm the proposed mitigations and life-of-mine monitoring programs. An Acid Rock Drainage/Metal Leaching (ARD/ML) management plan will be developed, incorporating an ARD/ML block model for the Marathon pit, that will address the management of all potentially acid-generating (PAG) materials to reduce potential effects for the Project. No PAG materials will be used as construction material, and all PAG materials will be managed to prevent development of acid drainage and/or metal leaching.
- Human Health
 - Additional information related to potential effects to human health from Project-related activities was requested. Since the submission of the EIS, a Human Health Risk Assessment (HHRA; Past 3, Appendix A) was completed to support the assessment of human health effects as part of the environmental assessment for the Project. The HHRA assesses interactions between measured or predicted concentrations of chemicals of potential concern (COPC) in environmental media (i.e., air, soil, water, and food items) that may occur due to Project-related emissions, and the potential for these interactions to result in adverse health risks to human receptors exposed to these media. The results of the HHRA demonstrate that the predicted changes in inhalation exposures, direct contact exposures to soil and surface water and ingestion exposures from the consumption of country foods represent negligible change in human health risk for Indigenous and non-Indigenous receptors.

Since the submission of the EIS Marathon has progressed corporate commitments regarding environmental and social stewardship, including the following:



VALENTINE GOLD PROJECT: AMENDMENT TO THE ENVIRONMENTAL IMPACT STATEMENT

August 2021

- Marathon has become a member of the Mining Association of Canada (MAC). As a MAC member, Marathon is committed to implementing the 'Towards Sustainability Mining' (TSM) initiative, including adopting the TSM guiding principles and conforming with the requirements set forth in the TSM protocols. The TSM protocols cover a wide range of topics including biodiversity, energy use and GHG emissions, Indigenous and community relations and crisis management. Associated reporting and verification processes (including self-assessment, external verification, CEO Letter of Assurance, and post-verification review by MAC's independent Community of Interest Advisory Panel) will present the public and regulators with an accurate picture of the mine's management systems and performance.
- Through TSM, Marathon is required to adhere to the TSM Tailings Management Protocol and Tailings Guide, which has been updated in 2021 to conform with the 2020 release of the International Council on Mining and Minerals' Global Industry Standard on Tailings Management.
- Marathon has committed to becoming a signatory to the International Cyanide Management Code and is designing the process facility and process water management system in this context.
- In early 2021, Marathon retained an external consultant to conduct a gap analysis of the Valentine Gold Project against the Equator Principles 4 (EP4) standards and International Finance Corporation (IFC) Performance Standards, used by Equator Principle Financial Institutions (EPFIs) to guide decisions regarding ESG risks for project financing. Marathon is currently implementing the EP4 Action Plan, developed following the gap analysis, including conducting additional biodiversity studies and assessments (Human Rights Risk Assessment and Climate Change Risk Assessment), and developing formal stakeholder engagement plans and grievance mechanisms for workers and communities.
- Marathon has initiated work to develop and implement an ISO 14001-conformant Environmental and Social Management System (ESMS). This is being designed to manage federal and provincial compliance commitments and conditions of authorization/permitting, incorporate and implement ESG best practice criteria to which the company has committed, and identify and manage risks to regulatory compliance. As per ISO 14001, ESMS scoping has been completed and the functional and workflow processes are currently being developed. It is anticipated that the ESMS will be functional prior to construction.
- Marathon continues to actively engage with communities, Indigenous groups, and stakeholders through in-person and virtual meetings, conference calls, correspondence, quarterly newsletters, notices, press releases, and social media and website updates.
- Since submission of the EIS, a virtual public information session was held with communities and other stakeholders in December 2020 to provide Project and corporate updates. Marathon has also held one in-person meeting (October 2020) and two virtual meetings (April and May 2021) with local government representatives to provide information related to the progress of the Project, introduce new personnel and discuss issues of concern. Regular meetings with local government are planned and Marathon will continue to meet with individual communities and community groups to discuss



VALENTINE GOLD PROJECT: AMENDMENT TO THE ENVIRONMENTAL IMPACT STATEMENT

August 2021

issues and opportunities associated with the Project. Marathon also joined the Central Health Community Advisory Committee in July 2021 as an industry representative.

- Following submission of the EIS, Marathon participated in two virtual information sessions targeted at Indigenous groups organized by the Impact Assessment Agency of Canada (November 2020). Marathon has also participated in the quarterly meetings of MAMKA (Mi'kmaq Alsumk Mowimsikik Koqoey Association) since April 2021.
- As part of Indigenous engagement, Marathon has entered into agreements with both Qalipu First Nation (Qalipu) and Miawpukek First Nation (MFN). In April 2021, Marathon and Qalipu concluded a Socio-Economic Agreement (SEA). The SEA provides the framework for a long-term, positive working relationship with Qalipu, and addresses matters such as ongoing engagement processes, training, employment and business opportunities for Qalipu members and Qalipu businesses, environmental stewardship and monitoring, and community investment. Marathon and MFN entered into a Memorandum of Understanding (MOU) in May 2021. The MOU provides for the undertaking of a Traditional Knowledge and Land and Resource Use study. Based upon the terms of the MOU, Marathon and MFN have committed to enter into negotiations with a view to concluding an SEA, similar to that which has been entered into with Qalipu.
- Engagement sessions were held with salmonid associations (December 2020) and with the Newfoundland and Labrador Outfitters Association (November 2020) to discuss EIS findings and mitigation measures and Marathon continues to provide these groups, environmental associations and other civil society organizations with Project-related information.
- Marathon is committed to ongoing and meaningful engagement with potentially affected communities, civil society organizations, Indigenous groups and other interested parties as the Project progresses. Engagement will be guided by a formal Stakeholder Engagement Strategy and a Community Grievance Procedure, both of which are being developed in conformance with Equator Principles 4 and which will be integrated into the Project's ESMS.

This EIS amendment has been prepared to respond to the regulatory and public comments submitted through the EIS review process. The responses have been prepared in accordance with the provincial NL EPA and Provincial EIS Guidelines and are considered to provide supplemental information and/or clarification of information contained in the EIS. The information provided in the responses does not change the EIS assessment conclusions. Therefore, routine Project activities are not predicted to cause significant adverse environmental effects on any Valued Component, with the exception of caribou. Marathon will continue to engage with regulators with respect to ongoing monitoring programs, and it is anticipated that these monitoring programs will continue and be adapted as required over the life of the Project (including closure and post-closure monitoring). Marathon is actively planning for and will implement high standards of environmental performance as part of its commitment to safe and responsible environmental, social and economic development. As part of the normal engineering progression for mining projects, and in consideration of input from regulators, Indigenous groups and stakeholder, Project design optimizations may occur as detailed design proceeds. Ongoing planning and design will continue to incorporate best environmental practices to avoid or reduce potential environmental effects. Any refinements or optimizations in the design will be reviewed by regulators at



VALENTINE GOLD PROJECT: AMENDMENT TO THE ENVIRONMENTAL IMPACT STATEMENT

August 2021

the provincial and federal level during the permitting phase of the Project for alignment with the EIS commitments and regulatory requirements.



August 2021

ATTACHMENT A

Detailed Table of Concordance



VALENTINE GOLD PROJECT: PROVINCIAL INFORMATION REQUESTS

August 2021

IR Number	External Reviewer ID	Specific Question/ Information Requirement
DHCS-01	Department of Health and Community Services	Analysis of potential pathways of exposure to contaminants and risks to human health from the project is needed.
DHCS-02	Department of Health and Community Services	As there may be project-related impacts to human health, the proponent should provide information regarding exposure potential for all relevant exposure pathways associated with project activities. A Human Health Risk Assessment is an effective and comprehensive means to examine all exposure pathways for contaminants of potential concern (COPCs) and assess the potential for adverse human health effects.
DHCS-03	Department of Health and Community Services	Baseline country food (consumption) data is needed to support the evaluation of potential project-related impacts to human health. An accurate baseline is necessary to assess the potential impacts to country food for the project.
DHCS-04	Department of Health and Community Services	The Population Health and Community Services Infrastructure Baseline Study shall describe measures to mitigate negative effects, and to promote positive effects, to Population Health for both the construction and operation phases and predict the potential for adverse residual effects and their significance. Such measures should also be assessed for their technical and economic feasibility. Safety zones established in relation to Project blasting should be described. Additional information describing proposed mitigation measures, their effectiveness and implementation is needed. Additional information should be provided to describe the mitigation measures to be utilized, the effectiveness of such mitigation measures and their implementation, in order to address potential impacts to human health from project related activities. Any environmental protection plans/environmental management plans that describe mitigation measures to address potential impact to human health should be provided for technical review.
DHCS-05	Department of Health and Community Services	Potential impacts on passenger and freight traffic on the Trans-Canada Highway and through Gander International Airport or other nearby landing strips; and freight traffic on ferry services across the Strait of St. Lawrence are not discussed.
DHCS-06	Department of Health and Community Services	The EIS indicates that Marathon will develop a Traffic Management Plan (page 13.21). The Plan should include consideration of the potential impacts of increased traffic on pedestrian safety in the communities of Millertown and Buchans Junction.
DHCS-07	Department of Health and Community Services	The EIS indicates that Marathon will develop a Traffic Management Plan (page 13.21). Any environmental protection plans/environmental management plans that describe mitigation measures to address potential impact to human health should be provided for technical review.
DHCS-08	Department of Health and Community Services	There are no provincial environmental noise standards. However, additional baseline data would be required to appropriately assess potential impacts of noise on the environment and human health.
DHCS-09	Department of Health and Community Services	Monitoring plans are required to ensure that all identified mitigation measures are achieving their objectives.
DIET-01	Dept Industry, Energy and Technology	It should be clearly described if Nalcor has indicated willingness to provide the required capacity of 23 MW to the project. It should be clarified with Nalcor, if power will be supplied from the Star Lake Generating station facility alone or will include power from other generation sources.
DIET-02	Dept Industry, Energy and Technology	Please describe the exact length and location (route) of the transmission line.
DIET-03	Dept Industry, Energy and Technology	Who is responsible for the cost of the transmission line?
DIET-04	Dept Industry, Energy and Technology	IET recommends continuing this engagement and engagement with Newfoundland Power, on all aspect of powers supply, and impact on electricity infrastructure (assets) in the province.
DIET-05	Mines Branch: Mineral Development Division	The tailings management facility (specifically the tailings dams) are structures requiring long term monitoring and maintenance (50 years+). At some point, the dams ultimately become the responsibility of the province to maintain. As it is stated the tailings will be non-PAG, the EIS must present a detailed plan for the closure of the TMF that includes the potential reclassification and decommissioning of the tailings dams.
DIET-06	Mines Branch: Mineral Development Division	Potential acid generating (PAG) waste rock has been identified in both the Marathon and Leprechaun deposits. The current proposal is to mitigate the ARD potential by blending PAG and non-PAG rock in the waste dump. The EIS must evaluate the feasibility of segregating PAG and non- PAG waste rock during operation with the intent of relocating the PAG waste to the mined-out pit for final deposition under water cover.
DIET-07	Mines Branch: Mineral Development Division	Stantec Report 2020: The report uses the phrase “not expected to generate ARD” in numerous locations when describing the results of the ARD/ML testing. The conclusions from the ARD/ML testing must be definitive and clearly state whether ARD/ML will or will not be generated.
DIET-08	Mines Branch: Mineral Development Division	The results of the kinetic testing appear based on one composite sample from Leprechaun and one composite sample from Marathon. As per the Stantec recommendations, additional kinetic field testing to refine the ARD onset time estimates and identify the need for mitigation measures related to ARD is required. The testing must consider the extremes in the blending that may occur in the stockpile (i.e., all PAG) and the impact this would have on the ARD/ML potential. The EIS must also include the full design of the low-grade stockpile (stockpile base, effluent collection and treatment system) and the plans to rehabilitate the LGO stockpile areas upon closure.
DIET-09	Mines Branch: Mineral Development Division	The EIS must address the extremes in the ore blending that may occur (i.e., all PAG rock from Marathon and Leprechaun) and the impact this would have on the ARD/ML potential for the high-grade ore stockpile. Additionally, the EIS must the address the operational criteria that must be developed to mitigate the ARD/ML potential for the high-grade stockpile.
DIET-10	Mines Branch: Mineral Development Division	The EIS must evaluate all sources of ARD/ML and incorporate the appropriate mitigation measures into the design of the TMF and the closure of the TMF.
DIET-11	Mines Branch: Mineral Development Division	The initial ARD/ML assessment indicated ARD/ML would not be a concern. The results of the ARD/ML program however show ARD/ML is going to be an ongoing concern during and after the completion of the project. The ARD/ML sampling program did not follow the MEND guidelines with respect to sample interval length, spatial distribution and minimum sampling frequency per lithology. Additional deficiencies are noted with respect to the composite samples and the conclusions derived from the samples. The deficiencies in the ARD/ML report must be corrected before the report is acceptable. Additionally, the EIS must also present the procedure / method for the identification and the management of PAG rock (ore and waste) which will be used during development and operational phase of the project.



VALENTINE GOLD PROJECT: PROVINCIAL INFORMATION REQUESTS

August 2021

IR Number	External Reviewer ID	Specific Question/ Information Requirement
DIET-12	Mines Branch: Mineral Development Division	A source of construction aggregate (overburden, rock quarry or mine waste) will be required for the development of the site. The TMF will be constructed from mine waste rock. The EIS does not include a discussion on the criteria for determining what material is suitable or is planned for construction purposes. The EIS must evaluate the ARD/ML potential for a materials used for site construction.
DTCAL-01	Dept Tourism, Culture, Arts, Innovation	The Valentine Lake Gold project may disrupt the big game carry capacity of the area in particular with regards to woodland caribou. This will devalue the visitor appeal and experience of our destination. It is imperative that Marathon Gold Corporation, Newfoundland and Labrador Outfitters Association (NLOA) and impacted outfitters work together in efforts to sustain the sector. The EIS as presented does not include an Outfitter Environmental Effects Monitoring Plan. The Department of Tourism, Culture, Arts and Recreation recommends that Marathon Gold Corporation amend the EIS submission to include an Outfitter Environmental Effects Monitoring Plan (OEEMP). The OEEMP should: <ul style="list-style-type: none"> Identify a program for monitoring the effectiveness of measures implemented to mitigate adverse environmental and negative economic effects to outfitters; Build on existing information, consultations and commitments made in the EIS, and conditions of the relevant permits and licenses for the project including mitigation objectives, metrics and targets, following and monitoring mitigation efforts; and Include a contingency plan should mitigation efforts not be successful. Also included in the OEEMP, the proponent shall work with affected outfitters and the NLOA to develop compensation provisions and in areas of new access and implement an access decommissioning plan to mitigate decreased big game success rates in the region.
ECC-01	Department of Environment and Climate Change - Pollution Prevention Division	Table 5.13 notes an operating schedule of approximately 291,000 truck trips per Year (along the combined haul routes). Table 5.14 specifies 716,667 truck trips per year. This number needs to be verified and the emissions inventory recalculated if in error. Section 2.7.5.2 estimates 30 million litres of diesel fuel to be consumed annually during operation. This number appears high based on our experience with other mining operations in the province and may be related to the truck haul trip estimate.
ECC-02	Department of Environment and Climate Change - Water Resources Management Division	As the dam consequence classification is only "provisional", this will need to be confirmed. The tailings dam design will be dependent on a final dam consequence classification.
ECC-03	Department of Environment and Climate Change - Water Resources Management Division	Section 19; This section talks about meetings and consultation with NL Hydro, but I don't see a plan, or information on what plan this would be contained in. Contact people/positions in Nalcor and Marathon should be identified, timelines for notification prior to specific events should be documented, etc.
ECC-04	Department of Environment and Climate Change - Water Resources Management Division	Section 7; Possible locations for a 100 x 100 m climate monitoring station compound should be identified.
ECC-05	Department of Environment and Climate Change - Water Resources Management Division	Design of stormwater management ponds and other water management features reference design AEPs (1:100, 1:25, 1:10, 1:200 etc.). Climate change AEPs should be used in the design and it is not clear if these will be used or not. This should be clarified.
ECC-06	Department of Environment and Climate Change - Water Resources Management Division	The foundation materials described for the tailings dam and hydraulic conductivity of MW4 well near the tailings dam location do not seem optimal. There is a lack of information on the foundation conditions and the possible design options that might need to be taken (e.g., foundation grouting). What are the plans for the design of the tailings dam with respect to the foundation of the dam, sub-surface conditions and how observed sub-optimal foundation material and sub-surface conditions will be addressed? There is no information on possible foundation seepage as there is not enough information on this aspect of the dam design.
ECC-07	Department of Environment and Climate Change - Water Resources Management Division	The closure plan for the TMF is dependent on the ARD/ML test results which do not seem definitive. Based on various statements in the reports, it is not clear if tailings are conclusively acid generating or not. If there is some doubt on this, TMF closure with planned options for both PAG and non-PAG material should be looked at, or there needs to be a definitive answer on if the tailing are PAG or non-PAG. If tailings are PAG, the current TMF design is inadequate and any TMF will have to remain long-term and cannot be decommissioned.
ECC-08	Department of Environment and Climate Change - Water Resources Management Division	Section 2.3.6.3 The source of potable water has not been identified.
ECC-09	Department of Environment and Climate Change - Water Resources Management Division	Section 2.5.3.1, pg. 2.105 Figure 2-43 shows a thrust fault within 300-550 m of the tailings dam. There is a lack of information on this fault and how it may impact the TMA. Further characterization of this fault area, in particular in the vicinity of the TMA is needed. Table 22.11, pg. 22.23 is this fault a geological hazard that could affect dam safety? It is not mentioned in Chapter 22.
ECC-10	Department of Environment and Climate Change - Water Resources Management Division	Possible monitoring sites for blast related ground vibration monitoring should be shown on a map. Monitoring sites should be established prior to any blasting for site development.
ECC-11	Department of Environment and Climate Change - Water Resources Management Division	Section 19, pg. 19.5; The assessment area for the dam VC ends at Red Indian Lake and only takes in a portion of Victoria Lake. A failure of the Victoria Dam would affect the entire Exploits River watershed, so this is not a valid assessment area.
ECC-12	Department of Environment and Climate Change - Water Resources Management Division	One thing not really addressed is the added traffic and visitation that might occur at the Victoria Dam due to better access roads, mine workers in and out of the area, etc. This might be more of an issue for Nalcor, but more people in the area means more people around the dam and more potential public safety issues. Nalcor may have to undertake or update their public safety plan for the Victoria Dam and look at possible mitigative measures. For example, I believe there is an existing gate across the access road to the dam.
ECC-13	Department of Environment and Climate Change - Water Resources Management Division	Changes in water quality from the development will impact the entire Lake, not just the portion of the Lake in the assessment area, and watershed systems connected to Victoria Lake, although dilution will significantly reduce any impact.



VALENTINE GOLD PROJECT: PROVINCIAL INFORMATION REQUESTS

August 2021

IR Number	External Reviewer ID	Specific Question/ Information Requirement
ECC-14	Department of Environment and Climate Change - Water Resources Management Division	<p>More a questions for Nalcor:</p> <ul style="list-style-type: none"> • Are there any known geotechnical deficiencies in the Victoria Dam, or known data gaps on geotechnical characteristics that may impact the evaluation of the geotechnical stability of the Victoria Dam with respect to the impact from blasting at the proposed mine? • Using the expected loading from blasting at the mine site, has Nalcor incorporated this into revised stability models? At what level of ground movement may there possibly be effects at the Victoria dam based on Nalcor stability models? • Does Nalcor have any thresholds for allowable ground movement near their dams? I have some concerns that the foundation material at the tailings dam may be sensitive to vibration. This needs to be examined more closely and dealt with as part of the TMF design. Also, the question of if blasting is likely to have any effect on the thrust fault located near the TMF has not been looked at. The Explosives and Blasting Management Plan should allow for sufficient time between blasts to allow for the dissipation of blast-induced excess pore pressures.
ECC-15	Department of Environment and Climate Change - Water Resources Management Division	<p>This statement relates to a possible tailings dam breach. Is there a plan for acute toxicity testing of tailings pond water? Tailings pond water could also be released through the emergency spillway. This statement relates to Red Indian Lake. Is there a plan for confirmation of the mixing zone volume on Red Indian Lake?</p>
ECC-16	Department of Environment and Climate Change - Water Resources Management Division	<p>For the dam break modeling, was the model only run for the tailings dam at the final phase of construction? This should be looked at and potentially modeled for each phase of the dam construction.</p>
ECC-17	Department of Environment and Climate Change - Water Resources Management Division	<p>BSA1 refers to the TMF dam as having East Dam, South Dam and West Dam. There is no figure indicating which portions of the TMF are what dam.</p>
ECC-18	Department of Environment and Climate Change - Water Resources Management Division	<ol style="list-style-type: none"> 1. This design will not work if the tailings are PAG. 2. All of the other associated dam safety work for the TMF in the EIS is based on this design and the assumption of non-PAG tailings. 3. What about the flowability of the tailings within the TMA? Is there potential for them to migrate and overtop the tailings dam? What about the flowability of the tailings under stressor conditions (e.g., blasting, high precipitation events)? What are the expected characteristics of this thickened tailings? Tailings characteristics listed in the Appendices of Appendix 2B are either assumed, no data, or to be revised following additional testing. 4. Are there examples of this type of TMF design with thickened tailings working well in similar northern/wet climates? There is no such current TMF design in the province, and this approach is currently relatively uncommon worldwide. 5. Tailings are to be mechanically thickened at the mill (pg. 2.192). Is there any redundancy if this infrastructure breaks down? 6. How will dust from the tailings beach be controlled? 7. Is there any manual or plan developed on best- practice for tailings deposition and O&M of this system? 8. Will a thickening agent be used to increase the stability of the tailings? 9. What are the characteristics of the thickened tailings? 10. How was a beach slope of 3% predicted or was this value just assumed (pg. 2.58)? What if the tailings beach slope above water are less than 3%? How will that affect the design and/or phased construction of the TMF? Will the beached tailing mounds be stable? 11. What if the tailings beach slopes below water are less than 3%? 12. Can we get a 3D rendering of what the TMF will look like? This will help put the uneven dam crest and height of the tailings mounds into perspective. 13. Will there be piezometers installed in the tailings deposit to monitor pore pressure in the tailings? 14. How many points of discharge of thickened tailings will there be into the TMA?
ECC-19	Department of Environment and Climate Change - Water Resources Management Division	<p>The location of this emergency spillway and direction of flow is not indicated in the EIS or Figure 2-43. Will the spillway be fixed at the stage 1A NE abutment, or move to that abutment with each stage?</p>
ECC-20	Department of Environment and Climate Change - Water Resources Management Division	<p>There is a lack of detail on the in-pit tailings disposal at the Leprechaun pit after year 8. If the hydrogeological parameters affecting the migration of seepage and contaminants are poorly understood, tailings with toxic contaminants or reactive tailings may be poor candidates for open pit tailings impoundment. Unless the purpose is to isolate sulfide tailings underneath water, the water table should be below the tailings disposed in the pit. This may require backfilling with mine rock or overburden. If backfilling underneath the tailings is necessary, and/or if the surrounding rock is not sufficiently impermeable, a liner may be required. The hydrogeological parameters affecting the migration of seepage and contaminants are poorly understood, so tailings with toxic contaminants or reactive tailings may be poor candidates for this type of impoundment.</p>
ECC-21	Department of Environment and Climate Change - Water Resources Management Division	<p>This analysis is included in Appendix 2A. Limitations on this analysis are the use of assumed values for most parameters and the sensitivity analysis that indicates that dam stability may be affected by currently unknown dam foundation properties.</p>
ECC-22	Department of Environment and Climate Change - Water Resources Management Division	<p>Will the liner extend the entire 3km length of the dam? Figure 2-44, pg. 2.106A 1 m thick coarse filter zone is indicated along the upstream embankment face of the tailings dam immediately beneath the sand bedding/liner. Will this filter layer extend to the downstream toe of the dam? The drawing cuts this off.</p>
ECC-23	Department of Environment and Climate Change - Water Resources Management Division	<p>Where did this 20% value come from? Where did the 1.7 and 2.7 m values come from? Could more tailings end up being released from the TMA during a breach? A volume of tailing equivalent to 20% of the volume of the pond water being released during a breach does not seem like a lot, although the report says this is a “conservative estimate”. Is the tailings slope likely to be maintained under the tailings pond? There is a lack of information on the characteristics and behavior of the tailings and how they might behave during a breach scenario.</p>
ECC-24	Department of Environment and Climate Change - Water Resources Management Division	<p>This PMP value is outdated and low. It should be up in the 370 mm range according to more recent data from ECCC. Also, this is for Stephenville. How applicable is climate data/PMP from Stephenville for this location?</p>
ECC-25	Department of Environment and Climate Change - Water Resources Management Division	<p>Why was the Great Rattling Brook above Tote River Confluence station used? It is 128 km to the NE of the site. Why not use LLOYDS RIVER BELOW KING GEORGE IV LAKE02YN002 as it is only 55 km away and is in the neighbouring watershed to the west?</p>



VALENTINE GOLD PROJECT: PROVINCIAL INFORMATION REQUESTS

August 2021

IR Number	External Reviewer ID	Specific Question/ Information Requirement
ECC-26	Department of Environment and Climate Change - Water Resources Management Division	The hydrologic model was calibrated using modeled data, which can compound errors.
ECC-27	Department of Environment and Climate Change - Water Resources Management Division	LIDAR should also be flown, or talk to Nalcor to see if they have LIDAR, of the Victoria River to Red Indian Lake.
ECC-28	Department of Environment and Climate Change - Water Resources Management Division	Does Nalcor agree with this assessment? Nalcor has seepage weirs and other infrastructure (drains) located at the toe of the Victoria Dam. Would any of this be impacted? The work done in the EIS indicates that there will be impact to the Victoria Dam from a tailings dam breach, but does not establish whether this impact will be adverse or not. Stating that there would be no adverse impact is not the same as showing modelling results that prove there is no impact. The only way to establish no impact is to do a stability analysis of the Victoria dam under these impact conditions, which has not been done. This must be looked at in order to determine the safety of the Victoria dam. There are 3 ways to get this done: 1) the dam owner (Nalcor) takes this information and has the Victoria dam analyzed, 2) Marathon covers the cost for Nalcor to get this work done, 3) Nalcor shares sufficient information on the Victoria dam so that Marathon can conduct this analysis.
ECC-29	Department of Environment and Climate Change - Water Resources Management Division	There are repeated references to ICOLD, 2019, but the reference is not included in the list of references at the end of the report. This should be added.
ECC-30	Department of Environment and Climate Change - Water Resources Management Division	Has relocation of the Process Plant been looked at? The effect of the scour from the tailings release on the South Dam should be properly analysed.
ECC-31	Department of Environment and Climate Change - Water Resources Management Division	BSA1, Attachment 1-A, pg. 29; Will the recommendations of Section 8 be acted upon?
ECC-32	Department of Environment and Climate Change - Water Resources Management Division	BSA1, Attachment 1-A, pg. 38; In Figure 5, the flow path for the South Dam does not show the flow going upstream towards the toe of the Victoria dam as discussed in the sections of the preceding report.
ECC-33	Department of Environment and Climate Change - Water Resources Management Division	BSA1, Attachment 1-A, Figure 17, 19, 21; How come there is no incremental difference area indicated between the tailings dam and Station 1 on this figure? Is there no flow over the emergency spillway on the tailings dam during PMF no breach scenario?
ECC-34	Department of Environment and Climate Change - Water Resources Management Division	BSA1, Attachment 1-B, pg. 18 Will the recommendations of Section 6 be acted upon?
ECC-35	Department of Environment and Climate Change - Water Resources Management Division	Why isn't this statement made in Attachment 1-B. The whole point of the assimilative capacity study was to arrive at this conclusion.
ECC-36	Department of Environment and Climate Change - Water Resources Management Division	No, we recommend the minimum should be 25 mm/s.
ECC-37	Department of Environment and Climate Change - Water Resources Management Division	Will the recommendations of Section 6 & 7, particularly for monitoring, be acted upon?
ECC-38	Department of Environment and Climate Change - Water Resources Management Division	What is the source for this rainfall amount? This value is low even based on recent ECCC IDF curves for Stephenville. It should easily be over 100 mm.
ECC-39	Department of Environment and Climate Change - Water Resources Management Division	A dam consequence classification of "very high" has been identified in part due to the potential loss of life from a dam failure. As most of the potential loss of life is likely to be workers at the mine site, how will this be mitigated? This section looks at different effects on the environment and how to mitigate them, but not much for the workers who are most potentially affected. They seem to be lumped in with "Community Health".
ECC-40	Department of Environment and Climate Change - Water Resources Management Division	More details should be provided on expected levels of seepage, seepage measurement, this seepage collection system, redundancy of the re-circulation system, etc.
ECC-41	Department of Environment and Climate Change - Water Resources Management Division	Any sedimentation pond with a berm height greater than 1 m will be considered a dam.
ECC-42	Department of Environment and Climate Change - Water Resources Management Division	Section 22.3.1.1, pg. 22.10; In the "Extreme Weather Events" section, there is no mention of rain on snowfall events that typically take place in winter and can result in extreme flooding in this region of the Island as happened in 1983 and 2018.
ECC-43	Department of Environment and Climate Change - Water Resources Management Division	It should be stated that the design of water management infrastructure will use future climate change precipitation values, not just that climate effects will be considered.
ECC-44	Department of Environment and Climate Change - Water Resources Management Division	Section 7.1.3.1, pg. 7.5, Figure 7-1; The choice of local assessment area and regional assessment area for surface water are not sufficient to the likely impacts. Only a portion of Victoria Lake falls in these areas. Why isn't the Victoria River included in the local assessment area? Why isn't the entire Exploits watershed and Bay D'Espoir (Grey River, White Bear River) watershed included in the regional assessment area? This site is located at the headwaters of both of these major watershed systems on the Island. The project will affect the entire watersheds, not just up to the outlet of Red Indian Lake and half way across Victoria Lake.
ECC-45	Department of Environment and Climate Change - Water Resources Management Division	Environmental monitoring (water quality, quantity, climate) at the site should continue into closure and post-closure phases of the project, until the site is chemically and physically stable.



VALENTINE GOLD PROJECT: PROVINCIAL INFORMATION REQUESTS

August 2021

IR Number	External Reviewer ID	Specific Question/ Information Requirement
ECC-46	Department of Environment and Climate Change - Water Resources Management Division	Different parts of this EIS, done by different consultants, reference different climate stations for different analytical purposes. This was necessitated by the lack of appropriate climate data for the project area, but demonstrates a lack of consistency. Did any of the consultants determine which climate station (and associated derived data) was the most appropriate to use as a best approximation for climate conditions at the site (looks like some comparison between Buchans and Stephenville was done, but what about Deer Lake)? This also demonstrates the need for the establishment of a climate station at the site.
ECC-47	Department of Environment and Climate Change - Water Resources Management Division	Worst case scenarios should be looked at for design purposes, even if just for sensitivity analysis purposes.
ECC-48	Department of Environment and Climate Change - Water Resources Management Division	Table 7.10, pg. 7.26; A streamflow coefficient of 62.5% for the RRA is on the low end. The project area is likely to experience a higher percentage of rainfall contributing to streamflow.
ECC-49	Department of Environment and Climate Change - Water Resources Management Division	Figures 7.12-13, pg. 40-41; Only partial bathymetry of Valentine Lake and Victoria Lake has been conducted. Is this sufficient to determine assimilative capacity and mixing zones? Will full bathymetry be done at some point?
ECC-50	Department of Environment and Climate Change - Water Resources Management Division	Figure 7-32, pg. 7.93; Figure 7-36, pg. 7.98; Seepage through the tailings dam is estimated at around 2300 m ³ /d according to Figure 7-36. How was this estimated? What hydraulic conductivity values were used? Will the amount of seepage through the tailings dam be monitored, or will this be done through monitoring pumping of recirculated seepage water?
ECC-51	Department of Environment and Climate Change - Water Resources Management Division	Figure 7-30, pg. 7.85; The emergency spillway on the tailings pond is located in the NE abutment. Should the TMF emergency spillway not also be include as a Final Discharge Point (FDP)? Where will this water discharge?
ECC-52	Department of Environment and Climate Change - Water Resources Management Division	Section 7-9, pg. 7.149; Due to the placement of mining operations, water quality and quantity in multiple watersheds has potential to be impacted. A network of multiple real time water quality and quantity monitoring stations will be necessary to monitor impacted areas. Discussions on real time monitoring locations with WRMD should occur as soon as possible.
ECC-53	Department of Environment and Climate Change - Water Resources Management Division	There should be a table similar to Table 7.51 outlining proposed monitoring for the TMA/dams included in Section 19. This should at a minimum include piezometers, seepage weirs/flows, vibration monitoring, movement and the frequency of each monitoring activity.
ECC-54	Department of Environment and Climate Change - Water Resources Management Division	Will the seepage ditch be fixed in location or continue to move downstream of the toe for each raise of the tailings dam? If it is fixed, it will be around 150 m downstream of the toe of the Stage 1A tailings dam (Figure 4). Will the ditch at this distance be able to capture seepage of the earlier tailings dam phases? Or is the ditch ~10 m downstream of the toe of each dam raise (based on distance indicated in Figure 4)? There should be some separation between the dam toe and the seepage ditch so as not to affect the stability of the dam.
ECC-55	Department of Environment and Climate Change - Water Resources Management Division	Section 7 Appendix 7C; There is no mention of the impact of lake turnover on POPCs and resulting water quality in receiver lakes (Victoria, Valentine, Red Indian). Lakes in the province do tend to see turnover events which can result in thorough mixing of the water column. To say that effects are limited to small areas of the receiver lakes may be initially correct, but impacts will eventually disperse throughout the entire waterbody.
ECC-56	Department of Environment and Climate Change - Water Resources Management Division	As both these stations are impacted by the Duck Pond Mine TMA, they are not appropriate to use as a regional water quality or quantity reference.
ECC-57	Department of Environment and Climate Change - Water Resources Management Division	Attachment 3-C, Figure 4.3, pg. 29; The map of evapotranspiration used to determine evapotranspiration at the project site is from 1992, and is based on empirical calculation of evapotranspiration using pre-1992 climate data. The project area location on this map is not correct, however, the evapotranspiration value used (463 mm) is at least in the correct range for the actual location. Due to the age of the data used to calculate the evapotranspiration, this value should be updated.
ECC-58	Department of Environment and Climate Change - Water Resources Management Division	Any idea of how many retention ponds may be retained in closure for the above purposes?
ECC-59	Department of Environment and Climate Change - Water Resources Management Division	If the tailings dam is retaining water or another substance such as tailings, it will still be classified as a dam. The closure description for the TMF is contradictory. The fact that the tailings dam will remain in place, and that there will still be a tailings pond at closure indicates a structure that will require long-term care and maintenance. The lack of detail concerning closure of the TMF, which is dependent on the design of the TMF, which is dependent on the tailings being non-PAG.
ECC-60	Department of Environment and Climate Change - Water Resources Management Division	NL considers any structure retaining water between 1-2.5 m to be a very small dam. Such structures will require an approval under Section 48 of the Water Resources Act.
ECC-61	Department of Environment and Climate Change - Water Resources Management Division	The design of the TMF based will entail significant tailings beaches as the tailings surface area under water is only about 20%. Tailings not under water could become wind-blown and deposit in the surrounding area.
ECC-62	Department of Environment and Climate Change - Water Resources Management Division	The recommendations made in the Executive Summary need to be actioned, in particular the above. The stability analysis for the tailings dams should be updated using information gathered from future geotechnical site investigations. The following recommendation made in Appendix 2B, Annex D should be made: "The analyses should be updated at the next phase of the project and following completion of a geotechnical investigation and laboratory testing campaign at the TMF site location. For example, if very loose non-cohesive foundation soils are encountered, a liquefaction assessment should be carried out, or if cohesive soils are encountered, undrained conditions should be considered in the analysis."
ECC-63	Department of Environment and Climate Change - Water Resources Management Division	Appendix 2B, Table 2, pg. 4; The IDF data is from 1966 – 2002 and under reports precipitation. The more recent climate change IDF curves should have been used: Final_Report_2018 (turnbackthetide.ca) Also, some reports have used Deer Lake for the IDF information and some have used Stephenville. This should be consistent and the more appropriate station to represent the project site selected. Appendix 2B, Section 5.4, pg. 10 "The 100-year, 24-hour event (75 mm of rain) was selected as the EDF." This rainfall value is not appropriate and underestimates the EDF. Climate change IDF should have been used.



VALENTINE GOLD PROJECT: PROVINCIAL INFORMATION REQUESTS

August 2021

IR Number	External Reviewer ID	Specific Question/ Information Requirement
ECC-64	Department of Environment and Climate Change - Water Resources Management Division	What is the basis of this assumption? The design of the TMF is highly dependent on the stability of the deposited tailings, especially as the tailings will be mounded higher than the crest elevation of the dams. If the tailings were to liquefy, they could potentially overtop parts of the dam. As well, how are rainfall/runoff events likely to impact the stability of tailings slopes? Are there examples of this disposal method and assumed slopes working well in similar latitudes/climates to the project site?
ECC-65	Department of Environment and Climate Change - Water Resources Management Division	Appendix 2B, Table 9, pg. 155 stages of tailings dam raises over 7 years is a lot. Is it possible some of these stages may be condensed together? Otherwise, your TMF is constantly under constructions. How might this continuous construction affect the stability of the tailings dam?
ECC-66	Department of Environment and Climate Change - Water Resources Management Division	Dam stability analysis will need to be refined and evaluated for each phased lift of the dam. This can be done at a later stage as part of the more comprehensive design and permitting process.
ECC-67	Department of Environment and Climate Change - Water Resources Management Division	Is there any plan to control the occurrence of geomembrane liner defects? Are these expected to be the result of poor installation or occur due to operational issues (e.g., flying blasted rock from the pit puncturing the liner, debris from the TMF area puncturing the liner, movement of bedding material allowing rock from the dam rockfill material to penetrate the liner). How are these and other likely operational issues that could affect the liner to be managed?
ECC-68	Department of Environment and Climate Change - Water Resources Management Division	Piezometers are not shown on any of the dam drawings. How many will be installed? With the 5 downstream raises over 7 years, how will the piezometers and other instrumentation be installed?
ECC-69	Department of Environment and Climate Change - Water Resources Management Division	Appendix 2B, Section 9.3, pg. 20; Real-time groundwater monitoring at shallow and deep levels will be required at multiple sites including near the tailings dam.
ECC-70	Department of Environment and Climate Change - Water Resources Management Division	Appendix 2B, Annex B, pg. 4; The water treatment plant operation is to be 8 months per year (April to Dec). The mill can operate and produce tailings 92.5% of the year. Is there sufficient storage in the TMF for this 4 month period when there will be input to the TMF but no discharge? How will the operation of the TMF be handled to ensure there is sufficient storage?
ECC-71	Department of Environment and Climate Change - Water Resources Management Division	Section 20; There should be some discussion of overall environmental trends within the spatial boundaries being looked at to better be able to judge cumulative effects from the project. For example, water quality in the exploits river has been on an improving trend, rebounding from the impact of the old Buchans Mine. Are effects from this development likely to impact this overall trend. What about the effects from the worst case scenario of a tailings dam breach and the cumulative effects of such an occurrence?
ECC-72	Department of Environment and Climate Change - Water Resources Management Division	Ideally, further characterization of these structural features should be completed; however, it may not be possible to characterize these features more completely at this stage of the project. A plan should be developed and presented outlining the timing of when this information will be acquired. The hydrogeological model should then be updated with all new data when available. This can be addressed as a condition of release.
ECC-73	Department of Environment and Climate Change - Water Resources Management Division	GEMTEC - Hydrogeology Baseline Report, within the Valentine Gold Project Baseline Study Appendix 3: Water Resources, Section 4.3, page 16: Further characterization of the Victoria Lake Group (VLG) rocks, located under the Leprechaun waste rock pile, tailings storage facility, process plant, and accommodations camp, is required. Only one hydraulic conductivity test was available (from the potable well in the current work camp), and likely does not fully characterize these units, especially in areas that may impact the environment (e.g., The Leprechaun waste rock pile, tailings storage facility and process plant). It is recommended that more observation wells be installed and tested, and these data be used to update the model. This can be addressed as a condition of release.
ECC-74	Department of Environment and Climate Change - Water Resources Management Division	GEMTEC - Hydrogeology Baseline Report, within the Valentine Gold Project Baseline Study Appendix 3: Water Resources, Section 4.4.2, page 21; The consultant notes that the abbreviated groundwater-level monitoring may not capture the full range of seasonal groundwater-level fluctuations, as the monitoring program had a duration of less than a year. An updated baseline study report and modelling should be provided once a full year of groundwater level monitoring has occurred. This can be addressed as a condition of release.
ECC-75	Department of Environment and Climate Change - Climate Change Branch	Therefore, the Climate Change Branch requests that the proponent provide appropriate information and/or analyses that illustrates how the facility plans to meet (or has met) the BACT requirements of the Management of Greenhouse Gas Act with regards to the machinery and equipment to be used by the facility. This information will need to be submitted to cabinet for final determination.
ECC-76	Department of Environment and Climate Change - Climate Change Branch	"Once operational, the Project will be regulated under the NL Management of Greenhouse Gas Act (2016) (MGGA) during the years for which the annual GHG emissions are greater than 15,000 tonnes CO ₂ e/year (predicted for the first nine years of operation)." (pg. 5.64) To clarify, section 4(1) of the Management of Greenhouse Gas Act (Act) states: "Except as provided in section 7, this Act applies to an industrial facility that emits 15,000 tonnes of carbon dioxide equivalent or more of greenhouse gases in any year after the coming into force of this Act." In other words, once the threshold of 15,000 tonnes has been met (during any phase of the project, construction or operation), the Act will apply to the industrial facility from that year forward, regardless of greenhouse gas emissions in future years. Exemptions can occur as per section 4(2) if certain conditions are met: "Notwithstanding subsection (1), where an industrial facility emits less than 15,000 tonnes of carbon dioxide equivalent in 3 consecutive years, the operator of the industrial facility may apply to the minister for an exemption from this Act." As per section 4(3), the exemption under subsection (2) expires if the facility emits 15,000 tonnes of CO ₂ e in a year after the exemption is granted. Furthermore, as stated in section 10(1), "An operator of an industrial facility to which this Act applies shall submit to the minister annually a report regarding the greenhouse gas emissions released and containing other information prescribed in the regulations."



VALENTINE GOLD PROJECT: PROVINCIAL INFORMATION REQUESTS

August 2021

IR Number	External Reviewer ID	Specific Question/ Information Requirement
ECC-77	Department of Environment and Climate Change - Climate Change Branch	"During the years in which GHG emissions are greater than 25,000 tonnes CO ₂ e/year (predicted for the first eight years of operation), the Project will be subject to greenhouse gas reduction targets as per section 5 of the MGGA and regulated under a performance standard, measured in terms of GHG emissions per unit of output within the facility boundary." (pg. 5.64) Section 5(1) of the Act states: "The Lieutenant-Governor in Council may make regulations establishing annual greenhouse gas emissions reduction targets for (a) industrial facilities that emit 25,000 tonnes of carbon dioxide equivalent or more of greenhouse gases in any year since the coming into force of this Act; and (b) opted-in facilities." An opted-in facility is defined in section 5.1(1) of the Act as an industrial facility that emits between 15,000 and 25,000 tonnes of carbon dioxide equivalent of greenhouse gases in a year. That facility may apply to the minister to be designated as an opted-in facility. Section 5(2) states: "An industrial facility shall achieve the prescribed annual greenhouse gas emissions reduction target each year." In other words, once the threshold has been met (the facility has emitted 25,000 tonnes or the facility has emitted 15,000-25,000 tonnes and has opted- in) and the facility has reached the fourth year of production (see more in part c below), the industrial facility will be subject to a greenhouse gas reduction target from that year forward, regardless of greenhouse gas emissions in future years. Exemptions can occur as per section 5(4) if certain conditions are met: "The Lieutenant-Governor in Council may make regulations exempting an industrial facility referred to in paragraph (1)(a) from achieving its annual greenhouse gas emissions reduction target where the industrial facility (a) emits less than 25,000 tonnes of carbon dioxide equivalent or more of greenhouse gases in 3 consecutive years; and (b) applies to the minister for an exemption."
ECC-78	Department of Environment and Climate Change - Climate Change Branch	"As the GHG emissions within the Project boundary are expected to be regulated under a performance standard pursuant to the MGGA (section 5), they will not be subject to the Revenue Administration Act carbon tax provisions." (pg. 5.64) Section 16.2 of the Revenue Administration Regulations states: "A carbon product used in a source category prescribed in paragraphs 5(1)(a), (c), (d) and (e) of the Management of Greenhouse Gas Reporting Regulations by an industrial facility that, at the time of the purchase of the carbon product, has a greenhouse gas reduction target under section 5 of the Management of Greenhouse Gas Act is exempt from paying the tax imposed under subsection 72.1(1) of the Act. "Section 3(3) of Management of Greenhouse Gas Act (Act) states: "Notwithstanding paragraph (1)(a), where an industrial facility commences production after these regulations come into force, Parts I to III do not apply to the industrial facility until its fourth year of production." Greenhouse gas reduction targets are established in Part II of the Act; therefore, this facility would not be subject to a greenhouse gas reduction target until their fourth year of production. Subsequently, the facility would be subject to carbon tax under the Revenue Administration Regulations for years 1 through 3.
OSW-01	Executive Council - Office for the Status of Women	OSW notes Marathon has not yet finalized socio-economic agreements with Indigenous stakeholders as of the drafting of this EIS and would like to know what Marathon plans to do if these agreements are not concluded in a timely manner.
OSW-02	Executive Council - Office for the Status of Women	Will the Project proceed if agreements are not made between Marathon and Indigenous stakeholders?
FFA-01	Department of Fisheries, Forestry and Agriculture	The EIS does not address the impact of dust on caribou & its habitat (see comments in Annex A). The EIS does not address noise & stress response in caribou (see comments in Annex A). The EIS mentions vibrations, such as in Sections 11.5.1.1 (page 11.53) 12.5.1.1. (pages 12.58-59), but it does not describe how the magnitude will be measured or mitigations planned.
FFA-02	Department of Fisheries, Forestry and Agriculture	The Baseline Caribou Study (Appendix 2 of the EIS) does not adequately: Represent the extent of use of the project area by caribou and relate it to the degree of risk posed by project components Integrate common findings between the three monitoring components (spring and fall camera surveys, population census) where these suggest accentuated risk to caribou. For example, common travel corridors used during both spring and fall migration represent increased risk due to their common use across seasons. Provide a comprehensive assessment of risk posed by the project as a whole to caribou migration and subsequently to caribou populations. For example, discuss implications for the Buchans caribou herd if they are unable to travel between calving and wintering grounds. Provide standardized analyses and summaries of data collected for all baseline studies Discuss the risks to caribou migration due to specific project components (pit, road, waste rock pile) based on caribou movement through the project area Propose effective mitigation measures for caribou, in particular migrating caribou, based on best practices and degree of obstruction posed by specific project components to migration during construction and operation. For example, the impact of the waste rock pile, directly in the path of a migratory corridor, is a major concern that is not evaluated or discussed. Several aspects of baseline information remain incomplete: Camera monitoring stations are not set up throughout the project area and include only a small number of cameras (12), some of which malfunctioned. Therefore, caribou use of the project area, with specific reference to entrance and exit points of migrating caribou during spring and fall migration, and crossing of the main road, is incomplete. A reliable baseline population estimate for Buchans caribou, the population most affected, is unavailable§ The method used to census the population was applied incorrectly and as a result there is no estimate to provide a baseline for future comparisons.
FFA-03	Department of Fisheries, Forestry and Agriculture	Table 11.13 does not contain mitigations that address specific projects components and their impact on caribou migration. Detailed comments are provided throughout the review. This is the primary deficiency of this EIS.
FFA-04	Department of Fisheries, Forestry and Agriculture	The Baseline Fish, Fish Habitat and Fisheries Study (Appendix 4 of the EIS) does not adequately:- provide the necessary baseline data to support assessment of effects on the recreational fishery.- provide a description and quantification of fish and fish habitat- provide necessary baseline data to support on-going monitoring programs that assess the effectiveness of mitigation and offsetting plans.- assess the upstream and downstream effects of the Project on fish, fish habitat and fisheries for all potentially affected waterbodies.- describe the limnology, hydrology, freshwater biota, fish species, associated habitats and habitat distribution that have the potential to be affected by project activities.
FFA-05		Mitigations should be extended to include collision reporting for all species, including bird and bat collisions with infrastructure, vehicles and equipment.
FFA-06	Department of Fisheries, Forestry and Agriculture	The current status of muskrat should be updated and more recent literature reviewed as part of the assessment.
FFA-07	Department of Fisheries, Forestry and Agriculture	Plants Mitigations are required for water nymph and marsh seedbox. A new plant species for Newfoundland and Labrador has been reported but requires verification. A monitoring and response plan is recommended should invasive alien species be detected
FFA-08	Department of Fisheries, Forestry and Agriculture	While the most important area for waterfowl is located outside the project area & further downstream on the Victoria River, the Wildlife Division asks that a 50 m vegetated buffer be maintained along the Victoria River, wherever feasible, to protect this sensitive habitat.



VALENTINE GOLD PROJECT: PROVINCIAL INFORMATION REQUESTS

August 2021

IR Number	External Reviewer ID	Specific Question/ Information Requirement
FFA-09	Department of Fisheries, Forestry and Agriculture	The results of the three monitoring components are not integrated and discussed (spring camera surveys, fall camera surveys, and post-calving aerial surveys) even where there are common findings which emphasize use of particular corridors. Commonalities in use between seasons indicate accentuated risk under these circumstances. For example, in spite of differences in how caribou move through the proposed mine project area in fall versus spring migrations, there are also many similarities i.e., both fall and spring camera surveys show extensive use and movement through the proposed waste rock pile near the pit, a feature which will likely block movement due to its extent and size. The absence of a discussion that integrates findings such as these undermine the risk posed to caribou migration by specific project components.
FFA-10	Department of Fisheries, Forestry and Agriculture	One of the key findings is that there is extensive use of the project area by caribou during migration, and this needs to be an essential element of assessment of potential impacts. The proposed rock pile is showing a lot of caribou use during migration and the project area is showing a lot of use as a whole based on the data. These are important findings and as such, it is important for the EIS to have a more focused discussion on potential impacts as well as a mitigation plan that addresses the high use of caribou within the project footprint during migration.
FFA-11	Department of Fisheries, Forestry and Agriculture	The remote camera monitoring that took place in Fall 2019 and Spring 2020 cannot be considered a survey as the cameras are not set up into an array based on principles of experimental design, and include only a small number of cameras (12), some of which malfunctioned. Further, cameras were not placed throughout the extent of the project area, or even along wildlife trails identified within this region. For example, figure 3-2 pg. 6 (Attachment 2B 'Spring'2020 Camera Survey', section 3.1), indicates that a number of wildlife trails that traverse the project area have no cameras placed on them, as does Figure 3-1 pg. 5.
FFA-12	Department of Fisheries, Forestry and Agriculture	As a result of cameras not being distributed throughout the project extent, gaps in knowledge of caribou use of the region persist, even though extensive use of the project site by caribou is clear i.e., ~ 700 caribou were photographed during spring migration, for cameras deployed between 60-80 days, and focal, intensive use of some areas is apparent (e.g., one camera alone detected 440 caribou Attachment 2B, Table 4.1). Consequently, knowledge of caribou use of the region is incomplete, which constrains assessment of potential impacts. For example: Attachment 2A, Section 5.0 (pg. 12) indicates that they were unable to determine where caribou exit the proposed project area during fall migration given a lack of cameras deployed in probable areas. Similarly, during spring migration the available information does not allow for a determination of how caribou approach the mine site and how many might be crossing the main road (Attachment 2B, section 5, pg 15). Given that road crossings have been identified as an impediment for Buchans caribou during a prior EA in the region (report was made available to the proponent) this significant limitation will preclude assessment of changes in road crossings before, during and after construction due to the lack of baseline information.
FFA-13	Department of Fisheries, Forestry and Agriculture	While the cameras provide information on caribou presence and timing of caribou movements, group sizes and composition, the overall results from the camera trapping are poorly summarized, are not standardized, and limited data analyses took place. For example: No standardized observations are included (e.g., # detections per camera monitoring days). Since the number of operational cameras varied by day it is unclear whether figure 4-3 Attachment 2B (page 11) and figure 4-2 Attachment 2A simply sum all observation per camera or are standardized by the monitoring effort (trapping days). Other data summaries that could have been included given the data collected are the (standardized) number of caribou detected per calendar day for each migration period, and summaries for the mean, median and range of detections per day for each season. No process to determine the number of discrete caribou observations was included. Since multiple images taken over a short time frame can overestimate the number of individuals, this is an oversight.
FFA-14	Department of Fisheries, Forestry and Agriculture	Improper application of the 'distance sampling' technique in the post-calving survey to generate an estimate of population size for the Buchans caribou herd makes this estimate wholly unreliable. Consequently, current baseline information on Buchans caribou herd population size is incomplete and future comparisons to changes in abundance during and after construction cannot be made using this survey estimate.
FFA-15	Department of Fisheries, Forestry and Agriculture	Significant use of the proposed waste rock pile location during fall migration is documented e.g., section 5.0 - "during fall migration caribou moved through proposed waste rock pile location near marathon pit as they travelled south"; Cameras depicted in Figure 4-1 in the proposed waste rock pile shows high numbers of caribou observations. Nonetheless, the discussion includes no reference to the fact this waste rock pile could therefore block a significant migration corridor, and what the potential impacts of such an obstruction would be for caribou returning to their wintering grounds under this circumstance.
FFA-16	Department of Fisheries, Forestry and Agriculture	A small number of camera deployments over a constrained spatial extent relative to the project area, limit the ability to describe baseline caribou activity and movements. For example, the single camera placed at the main road, an area that will have increased traffic and which caribou are likely to avoid under those circumstances, failed. Therefore, comparisons to future changes in use or avoidance of the road during spring migration cannot be made.
FFA-17	Department of Fisheries, Forestry and Agriculture	Figure 3-1 (page 5) shows generalized wildlife trails throughout the proposed mine site, including straight through waste rock pile and across the main road. However, the discussion includes no reference to the potential ramifications of this to caribou attempting to travel north through the mine site to their calving grounds. For example, the size, extent, height and location of the waste rock pile is likely to pose a significant, possibly insurmountable, obstacle. The possible impacts of this are not discussed and no mitigations are proposed.
FFA-18	Department of Fisheries, Forestry and Agriculture	Distance sampling to estimate population size is a valid technique to estimate population size, particularly where animals are aggregated and where they can be readily observed, as is the case for post-calving regions of the Buchans caribou range. Unfortunately, the technique was improperly applied in this survey (see General comments), and the resulting population estimate is unreliable.
FFA-19	Department of Fisheries, Forestry and Agriculture	Section 3.1.1 (first paragraph, page 4) – "The data was quality reviewed to remove locations that were either low quality or faulty e.g., 'Fix status =2'. This is an ambiguous statement, as it would apply only to ARGOS location data (not GPS, for which precision is measured using DOP values). Further, since precision of ARGOS data improves with higher fix status (e.g., a value of 3 is better than 2) this statement implies that the most precise locations were in fact filtered out prior to mapping the calving range. Therefore, more detail on how data was selected based on precision for all data types used is required.
FFA-20	Department of Fisheries, Forestry and Agriculture	Since individual calving ranges for animals are not defined, why were locations for animals with 50 locations eliminated, since these are pooled to define the calving range? Also, the number of locations and individuals removed from the analysis as a result of this decision need to be indicated.
FFA-21	Department of Fisheries, Forestry and Agriculture	It is unclear whether the 95% kernels were generated for individuals or for pooled animals within the population, given the above statement.
FFA-22	Department of Fisheries, Forestry and Agriculture	On page 4 – section 3.1.1, the statement "point telemetry locations from May and June were also used to inform the survey area" is confusing since the calving period is defined as occurring throughout May and June and these locations would have been used by default.



VALENTINE GOLD PROJECT: PROVINCIAL INFORMATION REQUESTS

August 2021

IR Number	External Reviewer ID	Specific Question/ Information Requirement
FFA-23	Department of Fisheries, Forestry and Agriculture	The statement “Transects were established within the survey area in an east-west orientation at 3 km intervals, consistent with WD protocol” is misleading given that the Wildlife Division has used distance sampling on only one other occasion (Middle Ridge 2012, report provided), in which case transect lines were spaced more tightly (e.g. closer together) and were based on expected caribou densities throughout the survey extent.
FFA-24	Department of Fisheries, Forestry and Agriculture	Section 3.1.2. one reference was checked for accurate reporting of ZOI in this paragraph—and it was incorrect: caribou ZOI in Boulanger et al is 14 km, not 11 km.
FFA-25	Department of Fisheries, Forestry and Agriculture	<p>The protocol for distance sampling was improperly applied. A key assumption of distance sampling is that the horizontal distance from the survey line perpendicular to each group of detected animals is measured. A recommended approach to accomplish this is to measure the sighting angle (using a rangefinder) from the aircraft to the centre of each group of animals. Then, a trigonometric calculation of horizontal distance incorporating the accurate height of the aircraft is applied. If using waypoints to estimate altitude, the elevation height of land needs to be subtracted from aircraft height to precisely measure aircraft altitude. The survey as conducted did not precisely measure the distance to caribou and did not accurately measure aircraft altitude. It also excluded over half of all caribou observations (e.g., if they were observed further than 500m away), even though caribou were readily observed at distances well beyond 500m. Therefore, the estimate of population size is invalid.</p> <ul style="list-style-type: none"> • Why was perpendicular distance not directly measured with a range finder? This is a required input. • Why was the assumption made that animals would not be sighted further than 500m away? This is a key error, as the creation of a detection function which models animals sighted by distance is a vital component of distance sampling and must be derived from the survey data, and should not be assumed a priori. • Was survey altitude subtracted from a DEM? The use of altitude measured from the helicopter without taking into account the topography of the ground results in an incorrect estimate of altitude, a required input into the calculation of survey results. • Why were observation 500 metres not included? The recommended practice is to truncate detection distances at the tail end of a histogram where detection probability is 0.15 (Buckland 2001: 103). The decision not to directly measure distances is affecting the calculation of results here, and may have led to the unnecessary exclusion of data (how many animals were sighted beyond 500m?). For a prior survey of NF caribou (Middle Ridge), the detection function showed animals were sighted up to 1000m, and the authors of this study reported that caribou detection between 400-500m was still 75%. • Table 4.1 (page 12) How many of the 307 groups (and associated individuals) were included in the analysis? How many fell outside the 500m distance or were seen while in transit? • It would be good to see statistics on the number of groups seen per line, and the size of those groups as a component of the presentation of results. This would help to assess caribou densities throughout the survey extent. • Was group size used as a covariate or was consideration given to using size-biased regressions, as smaller groups are less likely to be detected at greater distance? • This section identifies that more than half of all observations made of animals were excluded because they were observed further than 500m away. This explains why the reported number of animals seen on transect so closely match the population estimate (1700 vs 1704 caribou). The survey population estimate infers that all animals that were present in the survey region were detected, an implausible occurrence. In fact, because distances to animals further than 500m away were not measured, the detection function could not be properly estimated. As a result, the population estimate is unreliable (it is an underestimate) and this should be elaborated on as part of the discussion regarding the discrepancy between this estimate and the one from 2019. It also means that baseline information on population size for 2020 is not available, and will constrain assessment of future impacts. • Population estimates calculated using distance functions correct for imperfect detection by incorporating variability in detection probability. Estimates are reported as an estimate of absolute density with confidence intervals that reflect variability in detection based on a number of covariates. Because distances to caribou were only measured at distances 500m (and even in this case, imprecisely, by using bins of distance classes rather than exact measures), the detection function was not fully estimated over the distance in which caribou were observed from the aircraft and the resulting population estimate assumes that nearly all caribou that were present were observed. The population estimate must be considered unreliable.
FFA-26	Department of Fisheries, Forestry and Agriculture	Error: Argos collars provide a position every 4 days not every hour. The argos system collected positions for 6 hours every 4 days and most often a class 3 position was selected via filtering.
FFA-27	Department of Fisheries, Forestry and Agriculture	In July and Aug 2018, 3 adult caribou were killed by black bears on the Buchans Caribou Management Unit indicating that adults are also taken in addition to calves.
FFA-28	Department of Fisheries, Forestry and Agriculture	It states that “coyotes consume mostly moose” - add carrion to this statement.
FFA-29	Department of Fisheries, Forestry and Agriculture	section 'Change in mortality risk' does not include potential changes to calf mortality as a measurable parameter. Calf mortality is possible if females are unable to migrate successfully to calving grounds and calves are born elsewhere. Changes in calf mortality have the potential to significantly alter population size and trend.
FFA-30	Department of Fisheries, Forestry and Agriculture	Table 11.11 section 'Change in movement' does not include an impermeable migration corridor as a measurable impact. By summarizing loss only as a proportion of total migratory pathways it underestimates losses that may occur if the main corridor becomes impermeable to travel.
FFA-31	Department of Fisheries, Forestry and Agriculture	To assume an avoidance zone of only 500m during construction and operation of the mine is extremely conservative (small) and inconsistent with published literature, including studies cited in the caribou component study. This affects the discussion and assessment of risk surrounding potential habitat loss.
FFA-32	Department of Fisheries, Forestry and Agriculture	Why is additional hunting by project workers considered a component of mortality risk if hunting and fishing will be prohibited by project workers (Table 11.13)?
FFA-33	Department of Fisheries, Forestry and Agriculture	This whole section requires further discussion with respect to the information presented in the text. Given the high volume of caribou which pass directly through the project area twice a year, the level of risk posed needs to be comprehensively presented. See also comment for Chapter 11.3.3—discuss risk posed to caribou calves if migration to calving grounds can't be completed and caribou are born elsewhere.
FFA-34	Department of Fisheries, Forestry and Agriculture	The text indicates that the waste rock pile was moved and reconfigured—yet the component study and the section on caribou migration indicate that it is still directly in the path of migrating caribou. Please provide further detail on how this mitigative measure will improve caribou movements through the project area.
FFA-35	Department of Fisheries, Forestry and Agriculture	Noise emissions—please provide detail on how these will be monitored, and how their effects on caribou avoidance will be determined and mitigated. Place anticipated noise emissions into context relative to avoidance shown by caribou in other mining operations.



VALENTINE GOLD PROJECT: PROVINCIAL INFORMATION REQUESTS

August 2021

IR Number	External Reviewer ID	Specific Question/ Information Requirement
FFA-36	Department of Fisheries, Forestry and Agriculture	Given extensive use of the project area by caribou, particularly during spring and fall migration, and the fact that an essential migratory pathway travels directly through the project site, it is concerning to see no targeted mitigations which address permeability of this migratory pathway, including potential shutdowns or relocations of project elements which block this pathway, during this time period. Addendum: I see these are referenced in the text pg 11.65, but should be incorporated into this table.
FFA-37	Department of Fisheries, Forestry and Agriculture	Given the proximity of calving and post-calving regions for Grey River caribou (Figure 11-9), discuss potential implications if Grey River caribou avoid calving in these regions at levels beyond the 500m zone of influence estimated in this report.
FFA-38	Department of Fisheries, Forestry and Agriculture	It would be useful to provide statistics on the amount of indirect habitat loss if avoidance exceeds 500m, e.g., is closer to levels reported in the broader literature. Perhaps different scenarios—low, medium and high levels of avoidance could be presented and discussed in 11.5.1.3.
FFA-39	Department of Fisheries, Forestry and Agriculture	while the project area may affect 3.8% of the total migratory corridor, given that the corridor passes directly through the project area, and is obstructed by a major project feature (waste rock pile), the potential risk posed if the corridor is not passable is not fully assessed or discussed.
FFA-40	Department of Fisheries, Forestry and Agriculture	While there is some uncertainty in the degree of residual impacts on caribou, if migration is blocked or unable to occur the impact on the Buchans caribou population, which regularly uses a narrow migratory corridor that passes directly through the mine site, could be pronounced. This potentially highly detrimental impact needs to be more fully discussed as a component of risk faced by this population by this development.
FFA-41	Department of Fisheries, Forestry and Agriculture	Given the exposure to enhanced mortality (from vehicle collisions and from becoming trapped in the pit), when combined with the level of use shown by caribou throughout the project area, the assessment of risk as 'low' during construction and operation of the mine, is difficult to support.
FFA-42	Department of Fisheries, Forestry and Agriculture	The number of adverse impacts and their frequency, duration, and irreversibility, do not support the assessment of low to moderate risk assigned for 'Mortality'. This is exacerbated since their evaluation of mortality also did not include potential calf mortality if caribou cannot reach the calving ground. Since mortality will directly affect population abundance and trends, their ranking suggests there is little risk to the Buchans population; this assessment is not supported by the available information.
FFA-43	Department of Fisheries, Forestry and Agriculture	The statement 'caribou may be able to circumvent project features in the migration path, and possibly the Project entirely' is not supported by the analyses of caribou, movements or the information presented in the Caribou component study. The statement is conjectural and should be removed.
FFA-44	Department of Fisheries, Forestry and Agriculture	A key component of the EIS guidelines was to outline mitigations that resolve the project's effects on caribou migratory corridors. The analysis of migration patterns of Buchan's caribou through the project area presented in this document (Section 11.2.2.1 page 11.31, also figures 11-12, and 11-13) indicate that there was 'only one distinct population level path identified'. Similarly, the caribou component study indicates heavy use of the project area by migrating caribou during spring and fall (See Annex A). Residual impacts for Buchans caribou are considered to be of a 'high' magnitude. However, the EIS does not present detailed or effective mitigations related to key project components.
FFA-45	Department of Fisheries, Forestry and Agriculture	Significant gaps in knowledge with respect to caribou use of the project area, and baseline information on population size for Buchans caribou, remain and will hinder assessment of future impacts.
FFA-46	Department of Fisheries, Forestry and Agriculture	The potential impacts on the Buchans caribou population if caribou are unable to migrate to their calving grounds are not considered, even though calf mortality may be substantial in this case.
FFA-47	Department of Fisheries, Forestry and Agriculture	The assessment of (indirect) habitat loss is based on a very conservative level of anticipated avoidance (500 m) and will likely underestimate impacts on caribou during construction and operation phases of the development.
FFA-48	Department of Fisheries, Forestry and Agriculture	It would be valuable to include any literature about stress responses in caribou. It is anticipated that a key migration route becoming impassable may elicit a stress response, as will disturbance from noise and activity.
FFA-49	Department of Fisheries, Forestry and Agriculture	The EIS does not include discussion of cumulative impacts from disturbance, habitat loss, mortality, potential changes in migration stemming from project development on the Buchans caribou herd.
FFA-50	Department of Fisheries, Forestry and Agriculture	The EIS only indirectly addresses the effects of noise, lights and dust on caribou. Prior environmental assessments pertaining to the influence of mining on caribou and the scientific literature both suggest that air quality (dust) and disturbance from noise and light are significant contributors to the impacts of mining on caribou and their habitat. Specifically, mining operations produce dust which results in dustfall, dust on leaves, dust on lichen, and dust on vegetation, especially within 1 km of mining operations (Chen et al 2017). In addition, it increases airborne fine particulate matter (PM2.5). Collectively dust from mining operations alters soil pH and affects vegetation within the zone of dustfall (enhanced soil alkalinity reduces the availability of lichen and forage plants such as ericaceous shrubs). Monitoring of these items is informative for understanding the quantifying the impacts of mining on caribou and their habitat. All aspects of human activity (noise and light) are key disturbance stimuli for caribou and should be considered cumulatively. Noise disturbance has been shown to affect caribou by causing physiological stress, increased movement, less rumination, displacement (which may lead to predation) and enhanced energetic costs. In addition, alarm reactions have been directly observed in caribou during activities such as blasting, dumping and bulldozing. A recent study evaluating caribou response to high and low activity periods for a surface mining operation (normal operation versus holiday shut-downs of several weeks duration) suggested that caribou reduced use within 1.5 km of the mine, but ameliorated this response during low activity periods (Eftestol et al 2019). This suggests that moderating mining activity during critical periods (e.g., migration) may be an important tool for mitigation of the mine's effects, and should be measured and quantified.
FFA-51	Department of Fisheries, Forestry and Agriculture	The monitoring and mitigation plan developed for noise, light and particulates should include airborne fine particulate matter (PM2.5). Dust from mining operations alters soil pH and affects vegetation within the zone of dustfall (enhanced soil alkalinity reduces the availability of lichen and forage plants such as ericaceous shrubs). Monitoring of these items is informative for understanding and quantifying the impacts of mining on caribou and their habitat.
FFA-52	Department of Fisheries, Forestry and Agriculture	The Guidelines state fish and fish habitat must be quantifiable. A description of the standardized netting and electrofishing activities is required. For comparison with past and future projects, these procedures must be standardized and a complete description of the gear used (measurements and materials) as well as deployment technique must be provided, as provided in scientific journals. Fish presence and absence data must be standardized and similarities indices among waterbodies should be utilized. Note: Victoria Lake and Valentine Lake had minimal sampling performed; statistical analysis of the data is highly unlikely using parametric or non-parametric methods (i.e., Catch Rates, biological frequency distributions, etc...)



VALENTINE GOLD PROJECT: PROVINCIAL INFORMATION REQUESTS

August 2021

IR Number	External Reviewer ID	Specific Question/ Information Requirement
FFA-53	Department of Fisheries, Forestry and Agriculture	Were genetic samples taken? Contemporary sampling methods should employ DNA archive for all fish species samples. Were there any lethally taken fish?
FFA-54	Department of Fisheries, Forestry and Agriculture	Change Effort from seconds to minutes in all tables. Seconds should not be used. In addition, table descriptions are poor. Titles for figures and tables listing data must be "stand alone" and give all pertinent details on the title descriptions (i.e., when, where, and detailed descriptions)
FFA-55	Department of Fisheries, Forestry and Agriculture	All Tables should be "stand alone" as previously mentioned
FFA-56	Department of Fisheries, Forestry and Agriculture	This likelihood data has not been standardized and it is data deficient to suggest such likelihood unless the data has been collected in a standardized, repeatable, testable format. The data as presented is not quantifiable as per the guidelines.
FFA-57	Department of Fisheries, Forestry and Agriculture	The data needs to be quantifiable. As presented in the EIS, it is not standardized and therefore, unable to compare or monitor changes to fish populations over time. In particular, representative control lakes outside of the construction zone should be established to monitor long-term effects.
FFA-58	Department of Fisheries, Forestry and Agriculture	Also data for bathymetry, if not available using sounding equipment should also be estimated using methods as shown in Hollister et al. 2011; https://doi.org/10.1371/journal.pone.0025764 .
FFA-59	Department of Fisheries, Forestry and Agriculture	To monitor the toxicity of consuming fish flesh, in the project area, immediate and long-term sampling sites should be established throughout the drainage area to advise the public of suitability for consumption. This should include all metal contaminants that pose a risk to human health, in particular metals which bio accumulate through the aquatic food chain.
FFA-60	Department of Fisheries, Forestry and Agriculture	Baseline data must also include potential stream crossing locations in addition to collecting baseline data above sites, before and after construction. During past projects, stream and river crossings often are done without a detailed adherence to the Fisheries Act & Fisheries and Oceans Canada guidelines for installation (we found some 80% to be inadequate for fish passage on Phase III of the Trans Labrador Highway (FFA, unpublished data)). For example, the guidelines direct that a fisheries biologist be present during all stream-crossing installations to ensure adequate measures are followed as to not diminish fish passage. As the Act states: Fisheries Act: section 34.3(2) provides provisions for maintaining adequate flow and fish passage.
FFA-61	Department of Fisheries, Forestry and Agriculture	Spawning areas for freshwater species must be identified and quantitatively sampled using standardized techniques during fall spawning season including estimates of fecundity for long-term monitoring, in particular for Victoria Lake and Valentine Lake.
FFA-62	Department of Fisheries, Forestry and Agriculture	Age and growth profiles should be established at Valentine Lake and Victoria Lake using a minimum of 60 lethally sampled fish for Ouananiche and Brook Trout using established standardized sampling techniques. Otoliths and fin clips should be collected from all fish. Fish should be measured for length, weight, and sex. From these samples, they should be able to model growth and survivorship. These two lakes should have a standardized stock assessment performed as soon as possible, including both fisheries dependent and independent sampling.
FFA-63	Department of Fisheries, Forestry and Agriculture	Special Concern' is not a category used by the Species Status Advisory Committee (SSAC), rather 'Vulnerable' is the equivalent category in Newfoundland and Labrador. There needs to be distinction between the federal and provincial designations.
FFA-64	Department of Fisheries, Forestry and Agriculture	SARA listing also affords automatic protection of the residence, this is not mentioned in the text but it should be. Section 33 of SARA: No person shall damage or destroy the residence of one or more individuals of a wildlife species that is listed as an endangered species or a threatened species, or that is listed as an extirpated species if a recovery strategy has recommended the reintroduction of the species into the wild in Canada.
FFA-65	Department of Fisheries, Forestry and Agriculture	Other non-MBCA species managed by the province include corvids and jays.
FFA-66	Department of Fisheries, Forestry and Agriculture	The definition of Species at Risk provided here is very limited in scope. SAR status is not only determined by species rarity or a limited geographic range or an inherent sensitivity, but most often due to threats to a species that have led to population declines, or are expected to. Suggest this section be expanded with reference to other COSEWIC assessment criteria
FFA-67	Department of Fisheries, Forestry and Agriculture	The NL ESA and the federal SARA both designate and list species (they do not rank them whereas the CDC ranks species (i.e., the S ranks), and doesn't designate or list them. This point is confused under various species headings. Also, the S ranks are provincially prepared ranks in Newfoundland and Labrador and would be more accurately referred to as provincial General Status ranks. We provide them to the AC CDC for inclusion in their database but they are considered provincial ranks.
FFA-68	Department of Fisheries, Forestry and Agriculture	Should probably clarify why Common Nighthawk is listed as SNA and not a suitable target for conservation activities - it is, because it is considered 'casual/accidental'
FFA-69	Department of Fisheries, Forestry and Agriculture	The last paragraph under 'Bank Swallow' notes that the SSAC recommended a status of 'Not at Risk' in 2009. However, the SSAC has since reviewed and accepted the 2013 COSEWIC recommendation of Threatened and has endorsed the recommendation for designation and listing as such in the province of Newfoundland and Labrador.
FFA-70	Department of Fisheries, Forestry and Agriculture	It is recommended to cite the source SSAC report (2010) instead of the website. Available here: https://www.gov.nl.ca/ffa/files/wildlife-endangeredspecies-ssac-gray-cheeked-thrush-2010-ssac.pdf
FFA-71	Department of Fisheries, Forestry and Agriculture	Rusty Blackbird does occur in suitable habitat (i.e., forested wetlands) throughout the island of Newfoundland, but is uncommon. Established populations are not limited to central Newfoundland.
FFA-72	Department of Fisheries, Forestry and Agriculture	Suggest there be mitigations in place to ensure that slopes created by waste gravel/soil mounds be maintained at a slope unsuitable for bank swallow nesting, as to not encourage the species to nest at the site.
FFA-73	Department of Fisheries, Forestry and Agriculture	It is suggested that collision reporting be extended to all other species, including bird or bat collisions with infrastructure, vehicles, equipment. This is not listed as a mitigation measure in 7.6 (Mitigation Measures: Avifauna)
FFA-74	Department of Fisheries, Forestry and Agriculture	This section notes that 'muskrat may be recovering in certain areas (Gov of NL n.d.b). This appears to be older online information. Current trends suggest muskrat populations are declining in much of Newfoundland. The provincial furbearer biologist should be contacted for information on muskrat.
FFA-75	Department of Fisheries, Forestry and Agriculture	illustrates "Furbearing Trap Zones" however the trapline system in Newfoundland and Labrador is for beaver only and not all furbearers.
FFA-76	Department of Fisheries, Forestry and Agriculture	Scientific name for Hoary Bat should be Lasiurus cinereus; Aeorestes is a synonym



VALENTINE GOLD PROJECT: PROVINCIAL INFORMATION REQUESTS

August 2021

IR Number	External Reviewer ID	Specific Question/ Information Requirement
FFA-77	Department of Fisheries, Forestry and Agriculture	References Section it should read: Payne, N.F. and not Rayne for the citation: "Northcott, T. H., Payne, N.F., and Mercer, E. 1974. Dispersal of Mink in Insular Newfoundland. Journal of Mammalogy, 55:1, 243-248".
FFA-78	Department of Fisheries, Forestry and Agriculture	Updated literature on Hoary Bat in Newfoundland is available. See Darrian P. Washinger, Raymond Reid, and Erin E. Fraser "Acoustic Evidence of Hoary Bats (<i>Lasiurus Cinereus</i>) on Newfoundland, Canada," <i>Northeastern Naturalist</i> 27(3), 567-575, (27 August 2020).
FFA-79	Department of Fisheries, Forestry and Agriculture	The two bat species have been recommended by COSEWIC for designation and listing under the NL ESA; as such the provincial status for these species could change.
FFA-80	Department of Fisheries, Forestry and Agriculture	Northern Myotis and Little Brown Myotis should be 'presumed present' (not just possibly present), as 'large amounts of high quality habitat' exists and both species have been confirmed in surrounding/adjacent areas. It also states that 'both species have patchy distribution across the Island of Newfoundland'; however, this is not true for Little Brown Myotis, which is distributed throughout the island
FFA-81	Department of Fisheries, Forestry and Agriculture	Error - habitat assessment was done for Northern Myotis, not Little Brown Myotis
FFA-82	Department of Fisheries, Forestry and Agriculture	Wildlife Division supports the planned baseline survey for bats, and asks that this be a requirement. The Wildlife Division can provide advice with respect to acoustic survey planning.
FFA-83	Department of Fisheries, Forestry and Agriculture	Nodding water nymph, ranked S2 with nine other known locations in Newfoundland. The EIS states "The loss of a single individual of nodding water nymph is not expected to lead to a change in the population attributes of the species". The photo clearly shows multiple individuals, it is possible they meant "occurrence" but this needs to be made clearer. Even if they mean "occurrence", it does not follow that there will be no impact on the population in NL. Nodding Water Nymph is ranked as S2 and is therefore a species of conservation concern. As indicated in the mitigation table (9.10) states "Known occurrences of plant SOCC will be avoided. If avoidance of plant SOCC is not possible, seed collection or transplant of the plant will be considered in consultation with the applicable regulators." Therefore, Nodding Water Nymph should have mitigations considered given its status.
FFA-84	Department of Fisheries, Forestry and Agriculture	Water Nymph has been identified as a species of conservation concern and will be negatively impacted by project activities and development. While it is not known for sure whether the species can successfully be transplanted, the WD suggests that the proponent seed suitable habitat, matched for pH and water depth, outside the project footprint and monitor it for success in establishing.
FFA-85	Department of Fisheries, Forestry and Agriculture	A plant species not previously recorded for Newfoundland, <i>Carex atlantica</i> , was reported from all three plots of the wet coniferous forest and the single plot in the riparian thicket. This would be a newly discovered species to Newfoundland. Were specimens taken and confirmed by an expert? This is a standard procedure for "new" species but it is not clear in the documentation if this occurred.
FFA-86	Department of Fisheries, Forestry and Agriculture	This species could be misidentified; it is in a group with several similar species known from Newfoundland. However, in each of the plots where it was reported, one of the other closely related species was reported also. The identification should be confirmed.
FFA-87	Department of Fisheries, Forestry and Agriculture	Nodding Water Nymph (<i>Najas flexilis</i>) ranked S2 in Newfoundland was reported from a wetland pool and documented with a photograph of the plants in the water. The id is plausible but several Pondweed (<i>Potamogeton</i>) species look very similar and the photo is not diagnostic. Is there a specimen or a photograph of the plant out of the water that can help confirm identification?
FFA-88	Department of Fisheries, Forestry and Agriculture	<i>Ludwigia palustris</i> was reported from the project footprint, but the species is not ranked by the ACCDC was assumed to be non-native: "The province of Newfoundland and Labrador is not considered part of this species' distribution in official records (AC CDC 2015; USDA no date; VASCAN 2019), however, it was unofficially identified on the island of Newfoundland in 2012 (iNaturalist no date). Although this species does not have an assigned S-rank in Newfoundland and Labrador, it is typically common throughout its range, and there are no limiting factors or other reasons to suspect it will be rare once it becomes established in Newfoundland." A plant that is not ranked should be assumed native unless it is in an urban or garden setting, introduced in surrounding jurisdictions, etc. Otherwise, it should be treated as a species of conservation concern, with a specimen and some good photos as proof of existence. It is in the direct footprint of the project (Heap Leach Pad) and should be given the same mitigation measures. The record from 2012 has been confirmed as correct.
FFA-89	Department of Fisheries, Forestry and Agriculture	The mitigation table (9.10) states, "Construction materials (soils and rock) will not be sourced from locations known to contain invasive plant species". This is not something that is commonly known. Most quarries are likely to have some invasive plants if they have ever had any sections idle for a while. Will anyone go and certify the pits "weed free"?
FFA-90	Department of Fisheries, Forestry and Agriculture	The mitigation table (9.10) states: "Native seed mix (free of non-native, invasive, and weed species) and native species (where available) will be used as erosion control on exposed soils and overburden stockpiles and during site rehabilitation." It is unlikely that such a seed mix will be available commercially.
FFA-91	Department of Fisheries, Forestry and Agriculture	There are mitigation measures to limit the introduction of invasive alien plant species, but an ongoing monitoring and response plan is recommended should IAS be detected (e.g., containment/control/eradication).
FFA-92	Department of Fisheries, Forestry and Agriculture	5.3.4 Red Pine (S2) is mentioned here. It should be noted that natural populations of Red Pine in Newfoundland have been assessed by the provincial SSAC as Threatened (2015), and the species is currently recommended by COSEWIC for designation and listing under the NL ESA.
FFA-93	Department of Fisheries, Forestry and Agriculture	In Section 6.3.1.2 (page 6.10) Common Nighthawk, it is stated that Common Nighthawk are only known to breed in southern Labrador. According to Wildlife Division records, the only Common Nighthawk nest record is in the Lab City/Wabush area on a mine site. What is the source of these southern Labrador breeding reports? The Atlantic Canada Conservation Data Centre (ACCDC) does not have them in their database so we would really like to have the original source to add to our records. Also noted in Chapter 10, Page 10.23
FFA-94	Department of Fisheries, Forestry and Agriculture	In the sections describing each bird, summaries are inconsistent. Some sections state that the species is not listed under the NL ESA, other sections have no reference to the NL ESA. Also, some sections state what habitat the bird nests in, while others don't.
FFA-95	Department of Fisheries, Forestry and Agriculture	In 8.0, it should be stated that the two bat species are 'presumed present' (not having potential to occur) due to high quality habitat and confirmation of the species in surrounding areas.



VALENTINE GOLD PROJECT: PROVINCIAL INFORMATION REQUESTS

August 2021

IR Number	External Reviewer ID	Specific Question/ Information Requirement
FFA-96	Department of Fisheries, Forestry and Agriculture	Note that species assessed by COSEWIC but not yet listed under the provincial NL Endangered Species Act are currently under consideration, and their status may change prior to or during proposed project operations (e.g., Northern Myotis; Little Brown Myotis; Bank Swallow; Barn Swallow; Evening Grosbeak). Provincial designation and listing would afford additional protections to individuals and their residences and would initiate recovery planning activities. ESA listing updates may also occur for COSEWIC-recommended status changes that are not yet reflected in provincial ESA listings (e.g., Red Crossbill, Olive-sided Flycatcher, Common Nighthawk). Note accepted common names for the two bat species are Northern Myotis and Little Brown Myotis. Please see three attached supporting documents from the Department of Fisheries, Forestry and Agriculture.- Chen et al., 2017- Eftestøl et al., 2019- Fifield, Lewis, and Gullage, 2013
DFO-01	Fisheries and Oceans Canada	DFO has requested further details on the Sedimentation and Erosion Control Plan through IAA Technical Review Process and has provided advice on additional sedimentation controls as stated below:• When sedimentation/erosion controls are in use (i.e. cofferdams) downstream flows must be maintained.• Sedimentation/erosion controls must be installed properly, checked routinely and maintained.• Appropriate sedimentation controls should be used for any particular work (i.e. silt fences should not be used across stream/rivers).
ECCC-01	Environment and Climate Change Canada (ECCC-01 MSC-1)	(A) Update the estimates resulting from the RFFA (particularly the MAF and MMF) using the equations for the NW or SW which are much closer to the Project site than those used, or Provide additional rationale for using the NE region RFFA. Consider using the streamflow field data to validate this choice.
ECCC-02	Environment and Climate Change Canada (ECCC-02 MSC-2)	Use the continuous level data to validate the baseline water balance, baseflow index estimates, or RFFA.
ECCC-03	Environment and Climate Change Canada (ECCC-03 MSC-3)	Compare the value of the baseline environmental flows to the expected project flows from the associated months (winter: October to March and summer: April to September) for all watersheds.
ECCC-04	Environment and Climate Change Canada (ECCC-04 MSC-4)	(A) Provide further explanation for the apparent discrepancy between these two statements. (B) Compare the value of the baseline environmental flows to the expected flows from the associated months (winter: October to March and summer: April to September) for Valentine Lake.(C) Assess whether the pumping of Valentine Lake during the closure phase has the potential to affect the lake level, particularly during low water periods.
ECCC-05	Environment and Climate Change Canada (ECCC-05-EDD)	Confirm the environmental behaviour, fate and effects of not only cyanide ion in water but of hydrogen cyanide in air and the surrounding environment.
ECCC-06	Environment and Climate Change Canada (ECCC-06-CRD)	Provide clarification of the climate change information and methods used to apply the climate projections to relevant project design considerations.
ECCC-07	Environment and Climate Change Canada (ECCC-07-CWS-02)	Include Project Lighting in the “Alternative Means of Carrying out the Project” Section 2.11.
ECCC-08	Environment and Climate Change Canada (ECCC-08-CWS-03)	Provide a detailed description of all avifauna surveys that have been conducted for the Project to date, including maps showing each survey location (e.g., each point count location) in relation to proposed infrastructure and current habitat types. Provide tables presenting detailed survey results (i.e., data provided for each survey location (i.e., for each point count point) for each survey date). Data should include species, number of individuals, sex and age (adult, juvenile) if known. Conditions (e.g., wind) that may have influenced survey results should be identified.
ECCC-09	Environment and Climate Change Canada (ECCC-09-CWS-03)	(a) Wetland associated migratory bird SAR Clarify why avoidance is not possible in instances where habitat for landbird species at risk is not avoided. Confirm plans to implement conservation allowances in cases where loss of wetland habitat for landbird species at risk is unavoidable. (b) Migratory bird SAR potentially attracted to the project area by habitat alterations Develop a migratory bird monitoring program throughout the lifespan of the Project to verify attraction and use of the project area by migratory bird SAR, including modified habitats and infrastructure. Provide detailed beneficial management practices and mitigation measures that will be implemented to reduce the potential for migratory birds and species at risk to nest in the Project Area. Provide additional information on the measures to be implemented in the event that a migratory bird or SAR is found nesting in modified habitats or on project infrastructure in the Project Area.
ECCC-10	Environment and Climate Change Canada (ECCC-10-CWS-04)	Describe the potential effects to migratory birds and species at risk that could result from potential interactions with the tailings management facilities and settling ponds. Outline plans/measures to deter migratory birds and species at risk from tailings management facilities and settling ponds, including beneficial management practices and/or the development of an avifauna management and monitoring plan. This plan should be sent to ECCC-CWS for review prior to its implementation. Describe potential uncertainties related to the use of proposed mitigation measures, and discuss proposed adaptive management measures to be implemented in a timely manner in the event that adverse effects to migratory birds are expected.
ECCC-11	Environment and Climate Change Canada (ECCC-11-CWS-05)	Describe the beneficial management practices that will be implemented to avoid potential attraction of migratory birds to project lighting. Follow-up monitoring to verify that efficacy of mitigation measures should be undertaken, and adaptive management measures implemented if needed Contact ECCC-CWS when birds are found injured or dead at the site. If frequent bird interactions are observed, ECCC requests that the proponent consult with ECCC-CWS to develop a Project- specific site monitoring plan in an effort to address the issue.
ECCC-12	Environment and Climate Change Canada (ECCC-12-ES-01)	Evaluate sediment quality and potential risks to aquatic receptors as a result of sediment contamination and develop a monitoring program to evaluate changes in sediment quality.
ECCC-13	Environment and Climate Change Canada (ECCC-13-ES-02)	Confirm that these 2 conditions cited in CCME (2003) have been/will be met in the mixing zones that have been defined. Provide supporting data/information that bioconcentration or accumulation of toxic substances are not expected to reach toxic or harmful levels in water or sediments within the mixing zones.
ECCC-14	Environment and Climate Change Canada (ECCC-14-ES-03)	Compare sediment concentrations to the ISQGs.
ECCC-15	Environment and Climate Change Canada (ECCC-15-ES-04)	Explain how the potential effects associated with these parameters have been quantified.



VALENTINE GOLD PROJECT: PROVINCIAL INFORMATION REQUESTS

August 2021

IR Number	External Reviewer ID	Specific Question/ Information Requirement
ECCC-16	Environment and Climate Change Canada (ECCC-16-ES-05)	Clarify whether the Victoria River has been evaluated for potential habitat loss as it does not appear in the tabulation of waters bodies experiencing habitat loss in Table 8.15. Quantify the potential loss of productivity (in terms of specific effects, magnitude and duration) resulting from concentrations of parameters of potential concern exceeding CCME FAL in mixing zones been quantified.
ECCC-17	Environment and Climate Change Canada (ECCC-17-ES-06)	Provide risk assessment associated with pit lake turnover.
ECCC-18	Environment and Climate Change Canada (ECCC-18-ES-07A)	As post-closure exceedances of Freshwater Aquatic Life guidelines are predicted, assess the magnitude and duration of potential effects resulting from these exceedances. Outline the mitigation options to explain how and to what extent these effects will be mitigated.
ECCC-19	Environment and Climate Change Canada (ECCC-19-ES-07B)	Where effects are predicted, develop an evaluation of the performance of measures to prevent the deposit.
ECCC-20	Environment and Climate Change Canada (ECCC-20-ES-08)	Use other water quality datasets (in addition to those from the 1 water quality sampling location for each of the 3 ultimate receiving environments) to characterize the background water quality conditions (including seasonal variations) in these areas.
ECCC-21	Environment and Climate Change Canada (ECCC-21-ES-09)	Clarify whether the sediment of the Victoria River, which has been identified as one of the 3 ultimate receiving environments, has been characterized in this background study.
ECCC-22	Environment and Climate Change Canada (ECCC-22-ES-10)	List the watercourses predicted to have irreversible effects and describe the long term mitigation planned for each.
ECCC-23	Environment and Climate Change Canada (ECCC-23-ES-11)	Confirm that all seepage is captured and accounted for in the water quality model.
ECCC-24	Environment and Climate Change Canada (ECCC-24-ES-12)	With regard to plans to manage ARD for this project, confirm that mitigative measures (e.g., blending to maintain Neutralization Potential Ratios) to avoid ARD generation will be employed when waste rock is used in onsite infrastructure (e.g., road beds).
ECCC-25	Environment and Climate Change Canada (ECCC-25-ES-13)	Clarify the temporal boundaries for the project.
ECCC-26	Environment and Climate Change Canada (ECCC-26-MS-1)	Explain the rationale for using the 75 mm as the EDF value.
ECCC-27	Environment and Climate Change Canada (ECCC-27-MS-2)	Use update PMP estimates based on updated/longer periods of record, including for stations nearer the project site.
ECCC-28	Environment and Climate Change Canada (ECCC-28-MS-3)	<ul style="list-style-type: none"> Carry out modelling based on return-period estimates of extreme monthly values (e.g., 30- day durations). Consider effects of extreme rain events occurring at time of snow melt/run-off. Indicate the expected frequency for use of the spillway to remove untreated excess water during extreme events.
ECCC-29	Environment and Climate Change Canada (ECCC-29-MS-3)	Revise the distances in the table to reflect the distances to the mine site. Consider using Burnt Pond climate data in addition to the Buchans data to inform the description of climate used for the project (although care is advised as the data are less complete in the years after 1996).
ECCC-30	Environment and Climate Change Canada (ECCC-30-CWS-07)	ECCC-CWS recommends that a site monitoring plan be developed for the migratory bird breeding season as well as the spring and fall migration periods and implemented while floodlights are being used during nighttime hours. A site monitoring plan could include protocols such as dusk and dawn site inspections to look for migratory birds that may have landed on site, and/or inclusion of migratory bird searches into standard occupational health and safety daily inspections, etc. Should puffins and/or storm-petrels become stranded on the project site, both during construction and operations phases, the proponent is recommended to adhere to Procedures for handling and documenting stranded birds encountered on infrastructure offshore Atlantic Canada (attached; it should be noted that this reference document has been developed for offshore vessels, and may require modification for use on an onshore facility. ECCC-CWS should be notified if bird stranding incidents occur. Puffins should be treated in the same manner as storm- petrels). A bird handling permit will likely be required to implement the instructions in this reference document and the proponent must be advised that such a permit would have to be in place prior to the initiation of proposed activities. Please note that MBCA permit applications can be obtained from ECCC-CWS via email at Permi.atl@ec.gc.ca. If any migratory birds are found stranded on-site, the proponent should immediately contact ECCC-CWS for further instructions. The contact is Sabina Wilhelm (ECCC-CWS Marine Issues Biologist) at sabina.wilhelm@ec.gc.ca or 709-764-1957.
ECCC-31	Environment and Climate Change Canada (ECCC-31-CWS-08)	Migratory bird nests can be found in a wide variety of habitats and locations. Depending on the species, nests may be found at many heights in trees, in tree cavities, in shrubs, on the ground (including in hayfields, crops and pastures), on cliffs, in burrows, in stockpiles of overburden from mines, in quarry banks, within wetlands, and on human-made structures such as bridges, ledges, and gutters. It is difficult to locate most nests. Nest sites are often hidden and adult birds avoid approaching their nests in a manner that would attract predators to their eggs or young. Moreover, the amount, and complexity of habitat to be searched often limits the success of surveys intended to locate all active nests. The nests of a few species are easier to locate, particularly those in isolated trees, on human-made structures and/or in colonies. To determine the likelihood that migratory birds, their nests or eggs are present in a particular location, use a scientifically sound approach that considers the available bird habitats, which migratory bird species are likely to be encountered in such habitats, and the time periods when they would likely be present. This will help you plan work activities to avoid having an impact on nesting birds. If further investigation is required to determine the presence of breeding birds, consider conducting an area search for evidence of nesting (e.g., presence of birds in breeding through observation of singing birds, alarm calls, distraction displays) using non-intrusive search methods to prevent disturbance to migratory birds. In the case of songbirds, for example, "point counts" (a technique to locate singing territorial males) may provide a good indication of the present of nests of these birds in an area. Please contact Environment and Climate Change Canada's Canadian Wildlife Service office in your region for further technical information about investigation methods for non-song bird species (notably, waterfowl, waterbirds, and shorebirds). In most cases, nest search techniques are not recommended because, in most habitats, the ability to detect nests remains very low while the risk of disturbing active nests is high.



VALENTINE GOLD PROJECT: PROVINCIAL INFORMATION REQUESTS

August 2021

IR Number	External Reviewer ID	Specific Question/ Information Requirement
		<p>Flushing birds increase the risk of predation of the eggs or young, or may cause the adults to abandon the nests or the eggs. Therefore, except when the nests searched are known to be easy to locate without disturbing them, active nest searches are generally not recommended; they have a low probability of locating all nests, and are likely to cause disturbance to nesting birds. In many circumstances, harm is likely to still occur during industrial or other activities even when active nest searches are conducted prior to these activities. In some cases, nest surveys may be carried out successfully by skilled and experienced observers using appropriate methodology, and in the event that activities would take place in simple habitats (often in man-made settings) with only a few likely nesting spots or a small community of migratory birds. Examples of simple habitats include:</p> <ul style="list-style-type: none"> • An urban park consisting mostly of lawns with a few isolated trees; • A vacant lot with few possible nest sites; • A previously cleared area where there is a lag between clearing and construction activities (and where ground nesters may have been attracted to nest in cleared areas or in stockpiles of soil, for instances); or • A structure such as a bridge, a beacon, a tower or a building (often chosen as a nesting spot by robins, swallows, phoebes, Common Nighthawk, gulls and others). <p>Nest searches can also be considered when looking for:</p> <ul style="list-style-type: none"> • Conspicuous nest structures (such as nests of Great Blue Herons, Bank Swallows, Chimney Swifts); • Cavity nesters in snags (such as woodpeckers, goldeneyes, nuthatches); or • Colonial-breeding species that can be located from a distance (such as a colony of terns or gulls).
ECCC-32	Environment and Climate Change Canada (ECCC-32-CWS-09)	<p>Wildlife Response Plans (WRP) and avifauna surveys should be incorporated into emergency response contingency plans for scenarios that may impact avifauna directly (injury or mortality) or indirectly (impacts to habitat). In particular, WRP and associated surveys should be considered for TMF Malfunctions (Section 21.5.1) and Fuel and Hazardous Materials Spills (Section 21.5.3), especially for worst-case scenarios described with impacts surface water (e.g., Victoria River, surrounding wetlands, and lakes). ECCC-CWS has guidance documents available to support emergency response contingency planning for wildlife:</p> <ul style="list-style-type: none"> • Guidelines for effective wildlife response plans • Technical guidance and protocols for migratory bird surveys for emergency response Guidelines for the capture, transport, cleaning and rehabilitation of oiled wildlife.
ECCC-33	Environment and Climate Change Canada (ECCC-33-CWS-10)	<p>It is well documented that transmission lines and telecommunication infrastructure can provide a significant risk of bird mortality through both electrocution and bird strikes. Other concerns include the effects of electromagnetic radiation, habitat loss and habitat fragmentation on bird populations. There are several factors that determine the potential impact to birds, including transmission line siting, local topography, habitat, weather conditions, transmission pole design, and line configuration, to name a few. In addition, different species groups can have differing sensitivities, and may be impacted during feeding, breeding, courtships or migration. Though the issues are complex, many can be mitigated through proper planning and project design. To reduce the risk of disturbance or harm to migratory birds related to the development of transmission and telecommunication infrastructure, ECCC-CWS recommends implementation of the following beneficial management practices:</p> <ul style="list-style-type: none"> • An evaluation of the risk of collision by birds in the area (based on birds' use of the area surrounding the lines) should be completed; • Measures to avoid bird collisions and electrocution, including line placement and orientation, marking of lines (e.g., bird flight diverters), and design of structures (e.g., it is preferable to have a horizontal rather than vertical conductor configuration) should be considered during the transmission line design phase; • Markers (e.g. bird flight diverters) should be placed on the lines running across the project area to provide visual cues to birds and help reduce the incidence of bird strikes; • When selecting a Right of Way (RoW), the following measures should be considered: • Relocated RoW should be situated so as to be contiguous with existing RoWs, to the extent feasible. • The width/size of RoWs, temporary and permanent facilities, work areas, and access roads should be minimized, to the extent feasible. • Old-growth, mature, and interior forest habitat for migratory birds should be avoided. • Wetlands should be avoided. • A migratory bird monitoring plan should be developed to evaluate the effectiveness of these measures. • The proponent should contact ECCC-CWS for guidance, particularly if sensitive areas in the project area are detected through wetland inventories, and/or waterfowl or landbird surveys. ECCC-CWS can also provide guidance on the development of monitoring and/or management plans, as necessary
ECCC-34	Environment and Climate Change Canada (ECCC-34-ES-13)	<p>The proponent is reminded that there are also obligations under the MDMER if the proponent chooses to become a "recognized closed mine" (section 32). In general, effluent from Recognized Closed Mines may be subject to the General Prohibition of the deposit of deleterious substances of the Fisheries Act (Section 36(3)) rather than the MDMER effluent limits which could affect the design of project components.</p>
ECCC-35	Environment and Climate Change Canada (ECCC-35-ES-14)	<p>ECCC looks forward to future discussions on the details of monitoring network design (locations, parameters, frequency, etc) for surface water and groundwater quality monitoring programs at the construction, operational and closure stages of the project.</p>
ECCC-36	Environment and Climate Change Canada (ECCC-36-ES-15)	<p>It is the responsibility of the proponent to demonstrate that the overprinting of such areas by mine waste, including tailings and waste rock and for the management of process water, will not negatively affect any waters frequented by fish directly or indirectly.</p>
ECCC-37	Environment and Climate Change Canada (ECCC-37-MS-1A)	<p>Consider using long-duration IDF results available from ECCC's climate website Engineering Climate Datasets page (https://climate.weather.gc.ca/prods_servs/engineering_e.html) (click on Intensity- Duration-Frequency (IDF) Files, then on the folder IDF_Additional_Additionnel), for stations near the project area, as a way to confirm or improve on results from further away. This would also allow use of multi-day duration estimates for modelling/design where impacts from such events could be significant (e.g., such as Hurricane Igor, a 2- day extreme rain event). For example the 100-year r.p., 3-day rainfall estimates from Buchans, Burnt Pond, and Stephenville are 150, 170, and 148 mm, respectively, significantly higher than the 1-day duration estimates for the same return period.</p>



VALENTINE GOLD PROJECT: PROVINCIAL INFORMATION REQUESTS

August 2021

IR Number	External Reviewer ID	Specific Question/ Information Requirement
HC-01	Health Canada	Health Canada recommends the following revisions be requested from the proponent: Revise the LAA for the Indigenous Groups VC taking into account the appropriate scale and spatial extent of potential environmental effects, community knowledge and Indigenous traditional knowledge, current or traditional land and resource use by Indigenous groups, ecological, technical, social and cultural considerations.
HC-02	Health Canada	Health Canada recommends the following revisions be requested from the proponent: Revise the temporal boundaries for the purpose of evaluating potential impacts to human health. The EIS should clearly document the temporal boundaries of the projected impacts to the environment—this will address the timing and lifespan of the potential impacts of the proposed project. Temporal considerations for impacts to human health may also include the differentiation between acute and chronic exposures to elevated levels of chemicals in the environment and the durations over which chronic exposures may occur. This should include considerations such as the operating life of the project and the length of time a project may have an effect on the environment.
HC-03	Health Canada	Health Canada recommends the following revisions be requested from the proponent: a. Comprehensively identify all human receptors (both Indigenous and non-Indigenous) that may be impacted by the proposed project currently and in the future. These receptors should be clearly listed and identified on maps and figures in the EIS, including the type of receptor location (e.g., residence, cabin, recreational use area, country food harvesting, etc.) and proximity of the receptor location to the project. b. Provide information on the types and duration of activities (e.g., fishing, vegetation harvesting, hunting, swimming) of receptors.
HC-04	Health Canada	Health Canada recommends the following revisions be requested from the proponent: Complete a quantitative HHRA which estimates the exposure that individuals may receive from project related COPCs and identifies whether there may be potential risks associated with that exposure, accounting for the cumulative effects of current and proposed projects. Refer to Health Canada's Guidance for Evaluating Human Health Impacts in Environmental Assessments: Human Health Risk Assessment for additional information.
HC-05	Health Canada	Health Canada recommends the following revisions be requested from the proponent: Provide a comprehensive list of COPCs for the project. Refer to Health Canada's Guidance for Evaluating Human Health Impacts in Environmental Assessments: Human Health Risk Assessment for additional information.
HC-06	Health Canada	Health Canada recommends the following revisions be requested from the proponent: Re-evaluate the COPCs using appropriate health based screening criteria. Refer to Health Canada's Guidance for Evaluating Human Health Impacts in Environmental Assessments: Human Health Risk Assessment for additional information, specifically Section 7.1.2 Identification Of Contaminants of Potential Concern and Appendix C: Additional Information About Screening Chemicals of Potential Concern
HC-07	Health Canada	Health Canada recommends the following revisions be requested from the proponent: Revision of the EIS to include identification and screening of exposure pathways for project related COPCs. All potential pathways of exposure should be considered operable unless evidence-based justification is provided for their exclusion. Refer to Health Canada's Guidance for Evaluating Human Health Impacts in Environmental Assessments: Human Health Risk Assessment for additional information.
HC-08	Health Canada	Health Canada recommends the following revisions be requested from the proponent: Using the results of a completed HHRA, identify potentially unacceptable risks to human health and the mitigation measures required to reduce these risk to an acceptable level. If substantial baseline contamination exists, the potential for environmental contamination introduced by project-related activities may necessitate consideration of additional mitigation measures. If risks to human health cannot be reduced to acceptable levels with the implementation of mitigation measures then modification of project activities may be required.
HC-09	Health Canada	Health Canada recommends the following revisions be requested from the proponent: Revise the EIS to include mitigation measures for all potential COPCs and their potential pathways of exposure. These mitigation measures should be adequately supported by evidence.
HC-10	Health Canada	Health Canada recommends the following revisions be requested from the proponent. a. Provide an inventory of all emissions and contaminants of potential concern (COPCs) resulting from the proposed project in an air quality assessment. b. Provide on-site sampling and quantitative analyses of common air pollutants (including PAHs, VOCs, DPM, as well as PM2.5, NO2 and SO2) to help assess the project impacts on contaminant levels with confidence, or c. Should other assessment approaches, including the use of surrogates and/or a qualitative assessment, be more appropriate, provide a detailed rationale/explanation for any deviation from characterization/assessment approaches recommended in b), as well as an estimate of the uncertainty associated with the use of the alternative approaches. If an assessment is unnecessary for any air pollutants, provide a detailed rationale/explanation for exclusion. For more information refer to: Health Canada. 2016. Human Health Risk Assessment for Diesel Exhaust.
HC-11	Health Canada	Health Canada recommends the following revisions be requested from the proponent. a. Provide a detailed assessment of air quality, including potential residual adverse effects, in comparison to the appropriate CAAQS, recognizing that CAAQS do not represent a safe threshold for human health. b. Clarify how the proposed air quality criteria would adequately protect human health at exposure levels below the CAAQS or NL-APCR. Health Canada recommends the proponent acknowledge that the CAAQS should not be considered as "pollute-up-to" levels and proposed mitigation measures should not be confined to meeting the standards, but should also be targeted towards reducing population exposure to non-threshold contaminants associated with the proposed project.



VALENTINE GOLD PROJECT: PROVINCIAL INFORMATION REQUESTS

August 2021

IR Number	External Reviewer ID	Specific Question/ Information Requirement
HC-12	Health Canada	<p>Health Canada recommends the following revisions be requested from the proponent.</p> <ol style="list-style-type: none"> Provide further rationale on how the proposed LAA/RAA, including the 500-m area on either side of the access road along the 88 km section of the roadway, is sufficient to allow for conservative assessments of the project-associated changes to atmospheric environment and potential health impacts on human receptors. Clarify whether input from other potentially impacted Indigenous groups, communities and stakeholders were considered in development of spatial boundaries and monitoring site for air quality and noise studies. Identify potential human receptor locations in consideration of traditional land use activities by Indigenous peoples that may be affected by changes in air quality and noise levels. Revise the air and noise impacts assessment in consideration of these additional receptors. Identify potential human receptor locations in the expanded LAA/RAA that include Millertown and the first 8 km of the access road from Millertown to the turnoff near the Millertown Dam, as well as additional receptors beyond the 500-m buffer zone along the access road.
HC-13	Health Canada	<p>Health Canada recommends the following information be requested from the proponent:</p> <ol style="list-style-type: none"> Justify how data from the selected NAPS station are representative of baseline emissions at human receptor locations. If data from the NAPS station is incomplete or not representative of existing conditions at human receptor locations, consider conducting a site-specific baseline survey at potential human receptor locations for all ambient air quality parameters. Health Canada recommends a minimum of one year of baseline data to account for any seasonal variabilities. Alternatively, in the absence of representative baseline data, provide follow-up monitoring results at these locations to confirm that the predicted air pollutants and noise levels are accurate. See Section 6.5 of Health Canada's 2016 Guidance for Evaluating Human Health Impacts in Environmental Assessment: AIR QUALITY (https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidance-evaluating-human-health-impacts-air-quality.html) Present baseline ambient air quality data in appropriate statistical form defined in the CAAQS.
HC-14	Health Canada	<p>Health Canada recommends the following revisions be requested from the proponent.</p> <ol style="list-style-type: none"> Provide quantitative assessments of both short-term and long-term air pollutant levels and associated health effects during construction and operations. Provide appropriately scaled contour maps plotting the predicted common air pollutant levels, including PM2.5, NO2, SO2, PAHs, VOCs, and DPM, in reference to the human receptor locations identified during construction and operations. Provide further monitoring plans and mitigation measures to reduce health risks from exposure to the elevated levels of air pollutants at the accommodation camp.
HC-15	Health Canada	<p>Health Canada recommends the following revisions be requested from the proponent:</p> <ol style="list-style-type: none"> Provide further rationale on how the predicted air quality changes due to vehicle traffic will be limited to the 500 m buffer along the access road. Provide quantitative assessments of air quality and noise impacts in consideration of project activities along the access road, including the road construction and vehicle traffic (i.e. distribution of vehicles by type over daytime and nighttime hours) during construction and operations. Include diesel power generators as an air pollutant emission source.
HC-16	Health Canada	<p>Health Canada recommends the following revisions be requested from the proponent:</p> <ol style="list-style-type: none"> Include other common air pollutants in the FUP monitoring or provide rationale for their exclusion.
HC-17	Health Canada	<p>Health Canada recommends the following revisions be requested from the proponent:</p> <ol style="list-style-type: none"> Quantify sound levels at appropriate distances from any Project facility and/or activities and describe for each contributing source the timing (e.g., hours of night-time activities), number and duration of noise events and their sound characteristics, including frequency spectrum. Provide the hourly distribution of baseline noise events at night in comparison to predicted individual noise events at night at each receptor location. Noise mitigation measures should be considered where noise events at night are predicted to exceed 60 dBA Lmax outdoors 15 times at any noise receptor location. Clarify whether concerns relating to increased noise were raised by Indigenous groups or community members. Provide a rationale for excluding noise-related complaints as an indicator of adverse health effects. Health Canada recommends the proponent work with potentially affected communities and individuals to receive complaints related to noise and sleep disturbance and ensure that they are reported to residents on a regular basis to promote transparency and accountability. Compare low frequency noise monitoring results to ANSI 2005. <p>Refer to Health Canada's Guidance for Evaluating Human Health Impacts in Environmental Assessments: Noise for additional information.</p>
HC-18	Health Canada	<p>Health Canada recommends the following revisions be requested from the proponent: a) Provide measured baseline sound levels and change in noise levels, including change in %HA, as per Health Canada's noise guidance (2017) at all receptor locations with all applicable adjustments as per ISO 1996-1 (2016). Provide a description when they have been used or when it has been decided they are not applicable in a given scenario.</p>



VALENTINE GOLD PROJECT: PROVINCIAL INFORMATION REQUESTS

August 2021

IR Number	External Reviewer ID	Specific Question/ Information Requirement
HC-19	Health Canada	<p>Health Canada recommends the following revisions be requested from the proponent:</p> <ol style="list-style-type: none"> Describe how the noise monitoring location is representative of baseline conditions at sensitive receptor locations. Clarify how temporal variability will be considered (e.g., seasonal variation in levels, types of human activity, weather conditions) given the limited length and timing of the baseline monitoring. Ensure the baseline noise assessment includes details on current ambient day-time and night-time noise levels at key receptor points, including sensitive receptors (e.g., schools, community centres) and traditional land users, or priority areas as described by Indigenous groups, as well as information on typical noise events, such as sound sources, geographic extent and temporal variations. Provide baseline noise data and predicted noise level changes in consideration of the distribution of vehicles by type over daytime and nighttime hours along the access road during operations and construction. <p>Alternatively, in the absence of baseline data, provide follow-up monitoring results at these locations to confirm that the predicted noise levels are accurate.</p>
HC-20	Health Canada	<p>Health Canada recommends the following revisions be requested from the proponent:</p> <ol style="list-style-type: none"> Clarify how differential responses to sound characteristics that do not necessarily appreciably increase the sound level will be considered (i.e., in addition to the comparison of predicted and baseline sound levels) in the assessment of health effects from noise. Consider sound characteristics and adjustments, including but not limited to the ones provided in HC-17 & HC-18, in the assessment of residual noise effects. Identify and implement additional mitigation measures, if detailed annoyance and sleep disturbance analysis demonstrate the potential for Project-related residual adverse effects.
HC-21	Health Canada	<p>Health Canada recommends the following revisions be requested from the proponent:</p> <p>Revise the EIS to adequately evaluate the potential risks to human health associated with exposure to recreational waters that may be impacted by the project.</p> <p>Refer to Health Canada's Guidance for Evaluating Human Health Impacts in Environmental Assessment: Water Quality for more information.</p>
HC-22	Health Canada	<p>Health Canada recommends the following revisions be requested from the proponent:</p> <p>Revise the EIS to evaluate the potential risks to human health associated with consumption of drinking water (ground water and surface water sources) that may be impacted by the project.</p> <p>Refer to Health Canada's Guidance for Evaluating Human Health Impacts in Environmental Assessment: Water Quality for more information.</p>
HC-23	Health Canada	<p>Health Canada recommends the following revisions be requested from the proponent:</p> <ul style="list-style-type: none"> Revise the EIS to include an assessment of potential health risks associated with contamination of country foods through a human health risk assessment (HHRA). <p>Refer to Health Canada's:</p> <ul style="list-style-type: none"> Guidance for Evaluating Human Health Impacts in Environmental Assessment: Country Foods; and Guidance for Evaluating Human Health Impacts in Environmental Assessments: Human Health Risk Assessment for additional information.
HC-24	Health Canada	<p>Health Canada recommends the following revisions be requested from the proponent:</p> <ul style="list-style-type: none"> Revise the EIS to include an assessment of the potential health risk from methylmercury exposure through fish consumption.
HC-25	Health Canada	<p>Health Canada recommends the following revisions be requested from the proponent:</p> <ul style="list-style-type: none"> Revise the cumulative effects assessment of the EIS, if the level of risk to human health associated with this project changes as a result of other requested revisions.
TC-01	Transport Canada	<p>Approval from TC may be required in some instances. TC encourages the Proponent to contact the Navigation Protection Program (NPP). Under the Canadian Navigable Waters Act (CNWA), owners of works - other than a minor work or a major work - that are located on navigable waterways not listed in the schedule, which may interfere with navigation, have the option to: 1) either apply to the Minister of Transport; (approval review process and advertising and 30 day registry public review); or, 2) seek authorization through the public resolution process, and deposit specific information regarding their work on the new Common Project Search (online registry) inviting any interested party to comment (advertising and 30 day registry public review). **Note however, that bridges with piers placed below the high water mark of a watercourse always require an approval as outlined in the Major works Order (i.e. an application for approval is required).</p>
TC-02	Transport Canada	<p>According to some of the Figures provided in the EIS, the proposed rock stock piles and open pits for both Marathon and Leprechaun initiatives appear to overlap with unnamed waterbodies. Similar to the information provided above for the TMF, please confirm if these pits will require infilling or dewatering of fish-bearing and/or navigable waterbodies. As previously advised, if infilling or dewatering of a navigable waterbody is required an application for approval (GiC approval) will be need to be submitted to TC's Navigation Protection Program (NPP).</p>



VALENTINE GOLD PROJECT: PROVINCIAL INFORMATION REQUESTS

August 2021

IR Number	External Reviewer ID	Specific Question/ Information Requirement
PC-01	CPAWS	<p>a. While the caribou assessment for the Valentine Gold Project EIS utilizes recent data on caribou herd ecology in the region to determine impact magnitude and significance, there are gaps in the analyses provided in the EIS that could inform impact significance predictions and the development of follow-up and monitoring programs.</p> <p>b. Project-specific data was gathered on caribou use of some of the movement pathways through the Project Area, but much of the analyses in the caribou assessment were based on data gathered primarily by the province of Newfoundland and Labrador which conducts a wide-ranging caribou research program on the Island of Newfoundland. As a result, the available data, as presented in the EIS, is sufficient to identify impact pathways for caribou in the region, but gaps remain that raise questions about the magnitude of potential impacts.</p> <p>c. Previous research has demonstrated the precarious state of caribou on the Island, where population declines have only recently begun to slow down after declining rapidly from the mid-1990s to mid-2000s (Weir et al., 2014). The main hypotheses explaining the decline are that while: “predation is the main proximate factor influencing calf survival, limited forage conditions (as a result of competition, degradation, or phenology) ultimately may have predisposed calves to higher predation rates because of smaller sizes at birth and a lower ability to escape predators ... or adult nutritional stress may have resulted in reduced maternal care and defence.” (Weir et al., 2014, pg. 27). This demonstrates the complex set of interactions that are driving the density dependent response of Island caribou herds to changes in foraging conditions. The proposed project is likely to sever the main migratory corridor for the Buchans herd, but is missing an assessment of the habitat quantity, quality and connectivity in areas likely to be used as alternative migration corridors, if the Project proceeds. While the EIS acknowledges the significance of this potential impact, there is a lack of further analysis on the habitat quality of alternative movement routes to fully understand how forcing changes on caribou movement will impact herd fitness. Addressing questions about the habitat quality, quantity and connectivity along potential alternative migration corridors would inform our understanding of the consequences of the proposed Project for the Buchans herd.</p> <p>d. There is a lack of quantification of information in key areas that are necessary to inform the development of follow-up and monitoring plans. For example, the amount of landscape disturbance in the region is not measured as a part of the cumulative effects analysis even though it is used in the woodland caribou recovery strategy as a metric for landscape disturbance and population sustainability (Environment Canada, 2012). This information is necessary to understand the magnitude and trajectory of cumulative effects and their potential impact on population sustainability. Further, added quantification would contribute to the definition of monitoring targets to test impact predictions and mitigation effectiveness. It would also allow for the definition of triggers for adaptive management action.</p>
PC-02	CPAWS	<p>The proponent indicates a total of 30 mitigation measures to reduce negative impacts on Caribou. Of these, approximately 1/3 contain vague terms such as “to the extent practicable”, “where feasible”, “limited to that which is necessary”, “proper handling and storage”. For example, when the proponent states “Vehicles and heavy equipment will be maintained in good working order and will be equipped with appropriate mufflers to reduce noise.”, many questions remain unanswered:</p> <ul style="list-style-type: none"> • What is the definition of “good working order” and what standards are being followed? • What is an “appropriate muffler”? • What is the reduction in noise emission expected from the implementation of the measure? • How will the proponent evaluate whether or not the measure is effective? • What will be done in case maintaining a “good working order” and using “appropriate mufflers” are found to be ineffective at mitigating noise?
PC-03	CPAWS	<p>Some of the measures are deferred, pointing to the development of management plans (e.g., “Project facilities and infrastructure will be designed to limit noise emissions”; “Marathon will develop and implement a Traffic Management Plan to manage transportation of workers and materials to site, product leaving site, the number of vehicles accessing the site, and to reduce traffic delays”). Such management and design plans should be included in the EIA documentation, as there is no way for the public to understand and evaluate their content and appropriateness as mitigation measures.</p>
PC-04	CPAWS	<p>Other measures seem to stem from arbitrary thresholds. For example, changes in Caribou habitat use have been observed to occur as far as 23 km from a mining site (Plante et al., 2018). Similarly, what is the justification for limiting project-related air-traffic to 500 m? For example, mountain Caribous still have 30 to 40% probability of reacting to helicopter passes at altitudes between 500-1000 m (Wilson & Wilmshurst, 2019). If the project involves frequent use of aircrafts and helicopters, what is the expected acoustic disturbance from such activities? And again, activities will be reduced if Caribou is sighted within 500 m from project activities. Considering that avoidance and behavioral effects can occur at tens of kilometers from the site, this threshold does not seem appropriate, especially as a buffer for blasting activities.</p>
PC-05	CPAWS	<p>There are different references to the adoption of adaptive management strategies in case of negative events, however, this is a reactive approach rather than a proactive approach. The adaptive management cycle should start prior to the occurrence of such events, not be triggered by them. In addition to this, adaptive management should be a project-wide strategy and the application of its principles should not be tailored to specific events. In other words, the adaptive management approach should be applied to all mitigation measures – including monitoring their outcomes and updating the measures if found to be inefficient.</p>
PC-06	CPAWS	<p>Lastly, there is a contrast of objectives between different proposed mitigation measures. The proponent indicates that movement of Caribou (and other wildlife) will be facilitated by, for example, creating openings in snowbanks and providing low areas when building the access roads ditches. At the same time, placing of boulders / gates / fences is indicated as a mitigation measure to limit public access to the site. How are these two measures compatible? How is the proponent making sure that the barriers put in place to restrict public access will not affect Caribou (and other wildlife) movement as well?</p>
PC-07	CPAWS	<p>a. Please provide a quantitative analysis of caribou habitat preferences during each season.</p> <p>b. Please identify alternative migratory corridors based on habitat requirements and assuming a Zone of Influence (ZOI) around the Project Area at different distances based on similar developments, as identified in Table 11-14, pg. 11.56, to inform predictions.</p> <p>c. How much farther are caribou expected to travel as they migrate around the Project Area?</p>
PC-08	CPAWS	<p>a. Please provide an analysis of caribou habitat connectivity in the Regional Assessment Area (RAA), with and without the Project. b) Please conduct a quantitative caribou habitat fragmentation analysis, including an analysis of habitat patch size, number, distribution and connectivity.</p>



VALENTINE GOLD PROJECT: PROVINCIAL INFORMATION REQUESTS

August 2021

IR Number	External Reviewer ID	Specific Question/ Information Requirement
PC-09	CPAWS	Please discuss relative use by caribou of different migration pathways across the Project Area. The population-level migration corridor accounts for ~50-60% of collared caribou, where does the other 40-50% of the herd migrate?
PC-10	CPAWS	a. Please discuss how the findings of Benítez-López et al. (2010) justify the selection of 1 km and 500 m buffers around project-related infrastructure to define the LAA for the caribou assessment. b. Please discuss how studies focused on caribou responses to anthropogenic structures (e.g., Table 11.14, pg. 11.56) were incorporated in the definition of the LAA.
PC-11	CPAWS	a. Please provide estimates of indirect habitat loss based on previously observed zones of influence around mining projects in Canada and Newfoundland and Labrador. b. Please discuss how adjusting the ZOI and revising estimates of indirect habitat loss potentially changes predictions of impact magnitude.
PC-12	CPAWS	a. Please provide evidence from peer-reviewed literature, or monitoring reports from other developments that 'prove' the proposed mitigations will be effective. b. Please identify monitoring targets that will be used to confirm mitigation effectiveness and triggers for invoking adaptive management action.
PC-13	CPAWS	Please complete a landscape disturbance analysis that quantifies the existing, and proposed future, levels of linear and non-linear anthropogenic disturbance in the RAA. At a minimum, all disturbances should be buffered by 500 m when calculating disturbance levels for each caribou herd range potentially impacted by the Project.
PC-14	CPAWS	Although the Environmental Impact Statement recognizes that noise affects both human health and wildlife, the estimation of noise pollution is tailored to human health only, without any specific evaluation of wildlife impacts. The EIA disregards a large and growing body of work documenting the effects of anthropogenic noise on wildlife (For example, see: Farina, 2017; Kight & Swaddle, 2011; Kunc & Schmidt, 2019; Shannon et al., 2016). More importantly, many of the taxonomic groups considered as VC have been shown to be affected by noise pollution. Bats (Bunkley & Barber, 2015), birds (Francis et al., 2009; Injaian et al., 2018; Ng et al., 2020), and even Caribous (Slabbekoorn et al., 2018) respond to anthropogenic noise and can be negatively impacted by it. Bradshaw et al. (1997) showed how blasting for petroleum exploration may reduce foraging time and induce temporary habitat loss in woodland Caribou. Blasting is recognized as a source of noise in the EIA and this activity is scheduled to happen during daytime, with one pit active at a time, and if sensitive wildlife receptors are in the area, this may result in negative effects. Some species of bats, for example, may reduce the use of areas in which blasting activity occur (Tanalgo et al., 2017). However, the proposed analysis and results are most likely underestimating the overall acoustic output of the project and related activities. Blasting is not explicitly included in the acoustic evaluation, even though Health Canada identifies blasting as being either a highly impulsive or a high-energy impulsive type of noise, recommending the implementation of a + 12 dB adjustment for the estimated project acoustic footprint.
PC-15	CPAWS	The acoustic assessment is based on the contrast between the estimated project sound input and the measured baseline values. However, the baseline relies on four days of sound quality monitoring at a single location. Only two full records (midnight to midnight), collected in June 16 and 17 2020 were used to calculate the Ld, Ln, Lnd, and %HA values, indicating that the baseline estimated by the proponent relies solely on two days of acoustic monitoring. Two days of monitoring at a single location are not enough to capture the natural variability of the project area acoustic environment. Seasonal and daily changes in natural background noise occur throughout the year and are caused by changes in environmental conditions (e.g., temperature, precipitations, presence of snow and fog), and by changes in species distribution. For example, dusk and dawn are known to be times at which species vocal activity tend to increase, resulting in significant changes to the acoustic environment and in a higher potential of noisy project activities to cause disturbance. Furthermore, acoustic propagation is not constant across space, as natural features (e.g., exposed rocks, tree cover, natural barriers) and environmental conditions (e.g., humidity and temperature) contribute to small changes in acoustic propagation at the macro (kilometers) and micro (meters) scale. This means that the baseline presented in this study is characteristic of the recorder's specific location, not of the entire project area.
PC-16	CPAWS	Another shortcoming is the absence of regular acoustic monitoring during all of the project phases (construction, operation, decommission). The proponent needs to provide evidence that the mitigation measures contained in the EIS will actually result in noise levels that are below the threshold of disturbance for the different Valued Components.
PC-17	Brian McLaren and Richard Huang	The EIS should include long-term modeling of caribou demographics given a range of potential effects of loss of functional habitat due to on-site activities, road travel, and sensory disturbance. The modeling should include the parturition and calf survival analysis on the most recent data from the Buchans Plateau collared caribou, and a rationale—like the one in the footnote below—for a period of restricted activity. The model outcomes, which should be in the form of a sensitivity analysis, must then be compared to past effects of other developments to put the project proposal in context. This is one example of a cumulative effects documentation that should be a separate section of the EIS.
PC-18	Brian McLaren and Richard Huang	Noise should be modelled on the terrain and then monitored throughout the construction and operation phases, and any changes to mitigation measures should be put in place as needed with maximum sound recommendations agreed upon by the assessment agencies and the proponent, in consultation with the Newfoundland and Labrador Wildlife Division. This is the first of the adaptive management approaches that should be detailed throughout the EIS, and applies to sensory disturbance to a number of other wildlife species, e.g., hibernating bats.
PC-19	Brian McLaren and Richard Huang	Valentine Lake mine disturbance area should consider a 6 km buffer, which is more realistic than the 0.5 km buffer drawn in the EIS, especially when calving caribou are at their most sensitive. This larger disturbance distance was illustrated amply by monitoring effects on the La Poile caribou herd when the Hope Brook Gold Mine was in construction and operation phases.
PC-20	Brian McLaren and Richard Huang	A commitment to monitoring and to adaptive management will be essential to any industrial developments in a land of declining caribou.
PC-21	Brian McLaren and Richard Huang	Who will monitor the outcome of a goal for net gain of fish habitat as required by the Fisheries Act? For the EIS to lead to satisfactory outcomes on promised wetland restoration to this end, this goal of net habitat gain implies monitoring and rehabilitation beyond the three-year closure period.
PC-22	Brian McLaren and Richard Huang	Mitigating the effects of machinery and noise in flagged sensitive areas should occur throughout the duration of mine operation and decommissioning, and not just during construction. (The list given of examples of flagged areas on page 9.54 includes wetlands, hibernacula, mineral licks, roosts, and caribou migration corridors.)
PC-23	Brian McLaren and Richard Huang	Concerns about potential changes to flows in the Victoria Steadies Sensitive Wildlife Area seem to be downplayed on page 10.11, when these are real possibilities downstream of the proposed project area, where changes to groundwater flow are of course expected.
PC-24	Brian McLaren and Richard Huang	It is a concern that up to six olive-sided flycatchers, a threatened species, were recorded in the project area in 2019 (page 10.21).



VALENTINE GOLD PROJECT: PROVINCIAL INFORMATION REQUESTS

August 2021

IR Number	External Reviewer ID	Specific Question/ Information Requirement
PC-25	Brian McLaren and Richard Huang	A plan should be outlined for working with authorities and local stewards on limiting future access to avoid overfishing that may be introduced by improvement and extension of road access to the area.
PC-26	Brian McLaren and Richard Huang	A separate section of the document should describe cumulative effects of the proposed Valentine Gold Project given the two other environmental impacts in the area, i.e., the Star Lake hydroelectric project and the Victoria Lake diversion.
PC-27	Brian McLaren and Richard Huang	<p>The proponent, Marathon Gold, lists in the EIS the importance of caribou to Indigenous people; from a Mi'kmaq point of view, the impact on caribou is especially serious, because of the cultural significance of caribou to Newfoundland Mi'kmaq and the already perilous state of the caribou. Three specific concerns were raised from consultations done for the EIS:</p> <ul style="list-style-type: none"> a. in consultation with Qalipu, on the project's decommissioning, rehabilitation and closure, b. in consultation with Miawpukek, on the size of the project's footprint, and c. in other consultations, on the potential long-term effects of the project on fish and wildlife.
PC-28	Brian McLaren and Richard Huang	<p>Before returning to caribou, three critical comments on the approach of the EIS relating generally to impact are warranted; they will be followed by a few comments on other wildlife (sections 8, 9, 10 and 12). First, mention is made of two other prior major impacts in the immediate region, but the reader is left to ponder their cumulative impacts in lieu of these being presented in a separate analytical section. Notably, (1) in 1968-69, the construction of the Victoria Dam reversed flows, drew down groundwater, raised the water level of Victoria Lake some 35 m, narrowed the Victoria River, and flooded over 12 km² of habitat; and (2) in 1997-99, the Star Lake hydroelectric project flooded an additional 15 km² of habitat in the same general project area. The region has sensitive wetlands and narrow routes for migration of caribou. The proposed loss of an additional 35 km² of habitat, plus the sensory disturbance and other impacts of the Valentine Lake project, should be put in the context of these cumulative effects.</p> <p>A second criticism of the approach of the EIS: the post-shutdown vision beyond three years of monitoring during the closure phase lacks detail and often even mention. Again, context is key: the project proposal envisions 13 years of mine operation, but some long-term effects will be felt at least as long after closure. These latter effects suggest a plan is required over at least a decade to monitor, e.g., the leaching of any contaminants in slow-moving groundwater, revegetation of disturbed areas, and demographic effects on long-lived animals like caribou, for which behavioural changes may imply modest short-term, but cumulative long-term effects on persistence. Third, and related to a call for long-term monitoring, the EIS misses an opportunity for adaptive management that, in fact, could document the success of some proposed novel mitigative measures.</p>
PC-29	Brian McLaren and Richard Huang	The mitigating measures for caribou cannot rely on the actions of monitors; during a sensitive period before and after calving, all construction and mining operations must cease.
PC-30	Brian McLaren and Richard Huang	At less sensitive times of the year (e.g., following the logic of the footnote, from 25 July to 15 May, with an option to shorten the period, either 15 September to 15 May or with a second restricted period timed to the fall migration of the Buchans Plateau caribou), any loud noises like blasting must not occur within a 3-km buffer (not a 0.5-km buffer) of any caribou spotted by monitors or crew.
PC-31	Brian McLaren and Richard Huang	A long-term plan should be presented to monitor recovery where it is expected to take longer than three years. Examples are monitoring effectiveness of revegetation of disturbed sites, including tracking invasive species, monitoring quantity and quality of ground and surface waters, and ensuring a net increase in fish habitat.
PC-32	Brian McLaren and Richard Huang	The EIS is quite clear on the paramount significance of the potential development impacts on the Buchans Plateau caribou herd, and to a lesser extent on three other herds (La Poile, Grey River, and Gaff Topsails). However, two important points need to be made here that implicate failures in the EIS and its background data analysis. The first is that, in addition to acknowledging the new complexities of environmental impacts with the establishment of coyotes as a major predator of caribou calves, the proponent needs also to recognize that the long-term implications are part of the cumulative effects of past developments, plus the arrival of the coyote. They will play out over the long term and via generations of changes to calf recruitment (Mahoney et al. 2016, Lewis et al. 2017). Dynamics by herd will differ, as the literature indicates: variable effects of predation depend on weather (Bastille-Rousseau et al. 2015) and on changes to caribou behaviour with food limitation (Schaefer et al. 2016). The second point deserving mention involves the distance over which sensory disturbance will occur to caribou, to be discussed ahead.
PC-33	Mining Watch Canada/J. Kuipers P.E.	Do the geochemical characterization and water quality predictions in the EIS account for the potential impacts to waste rock discharges that might occur due to this change? What is "a relatively small percentage?" A range should be provided by the proponent relative to the market price of gold, and consideration should be given to the potential impact on water quality predictions associated with the waste rock piles should this occur, based on the actual range of percentages and geochemical characterization of the low-grade ore that could be reclassified as waste rock. If potential impacts are reasonably possible, which would best be confirmed by modelling this scenario versus the base case, the water quality predictions in the EIS should include a scenario that addresses this possibility.
PC-34	Mining Watch Canada/J. Kuipers P.E.	The EIS in Section 2.3.4.1 states that Golder first proceeded with a high-level options evaluation to select the best tailings deposition method and TMF site. (underline added) As the assessment is not actually referenced or provided, whether it is "high-level" or "detailed" cannot be determined. However, as the assessment did not involve a Multiple Accounts Analysis such as recommended by MAC 2019,1 we do not believe it could be considered to be a "detailed" analysis.
PC-35	Mining Watch Canada/J. Kuipers P.E.	The idea of locating the TSF where it could result in potential interaction and risks associated with the Victoria Dam and Victoria Lake Reservoir to begin with was highly ill-advised from the standpoint of fundamental facility engineering safety considerations. The choice of this critically flawed approach is an example of the limited capacity of an exploration company to develop a major mining project.



VALENTINE GOLD PROJECT: PROVINCIAL INFORMATION REQUESTS

August 2021

IR Number	External Reviewer ID	Specific Question/ Information Requirement
PC-36	Mining Watch Canada/J. Kuipers P.E.	The EIS should avoided the use of generalizations and provide actual values whenever possible. How much is the tailings stability increased (e.g., minimum FOS increased from x to y)? How much was the dam height decreased as a result of increased tailings stability? By what actual volume is water storage reduced? How does reducing the volume reduce the risk of TMF failure due to piping or overtopping? How much is tailings effluent water reduced, or water quality within TMF improved? How much is the risk of groundwater infiltration decreased, or potential inundation area reduced? How much does the deposited density of the tailings increase, and how will that improve settlement over time and aid in mine rehabilitation and closure and post-closure stability of the facility? While there may be some small improvement in some of the tailings and TSF characteristics as suggested, they are overstated if they are compared to other tailings deposition types such as paste or filtered tailings. In some cases, the benefits are limited. For example, while increasing the deposited density of the tailings will increase the rate at which consolidation of tailings takes place, allowing mine rehabilitation and closure to take place more quickly, it will not by itself improve the long-term tailings density, and therefore will not significantly (e.g., by more than a few years over the longer term) aid in post-closure stability of the facility. These values should be put in perspective as compared to paste or filtered tailings.
PC-37	Mining Watch Canada/J. Kuipers P.E.	a) The EIS should avoided the use of generalizations and provide actual values whenever possible (i.e., How much is the tailings stability increased (e.g., minimum FOS increased from x to y)? How much was the dam height decreased as a result of increased tailings stability? By what actual volume is water storage reduced? How does reducing the volume reduce the risk of TMF failure due to piping or overtopping? How much is tailings effluent water reduced, or water quality within TMF improved? How much is the risk of groundwater infiltration decreased, or potential inundation area reduced? How much does the deposited density of the tailings increase, and how will that improve settlement over time and aid in mine rehabilitation and closure and post-closure stability of the facility?) b) The EIS should note however that the tailings deposited within the exhausted open pit do post a potential risk of release of Mining Influenced Water (MIW) via groundwater.c) Has co-disposal of waste rock and tailings in open pit to bring to original contours been considered?
PC-38	Mining Watch Canada/J. Kuipers P.E.	The inclusion of revegetation as part of closure as well as capture of water runoff during operations are both long recognized best practices, and rather than being refinements, should be considered as fixes to fatal flaws in the original design. It is concerning that the exploration company that proposes to advance and ultimately operate the project would not, on their own, have included standard design and reclamation practices such as revegetation and stormwater capture in their original plans.
PC-39	Mining Watch Canada/J. Kuipers P.E.	What assurance is there that the low-grade stockpiles will be processed if the price of gold drops?
PC-40	Mining Watch Canada/J. Kuipers P.E.	The updated water management design is important with respect to mitigation and should be required to be completed and included in the EIS.
PC-41	Mining Watch Canada/J. Kuipers P.E.	What about topsoil? The EIS is not consistent. Is topsoil = organic materials?
PC-42	Mining Watch Canada/J. Kuipers P.E.	The lack of a requirement for a detailed Rehabilitation and Closure Plan (RCP) is not typical of best practice, which instead suggests that the entire mining life-cycle should be considered at the initial design stage for planning and environmental assessment. A conceptual but reasonably detailed RCP is required in order to consider the effects of the proposed project as discussed further in these comments.
PC-43	Mining Watch Canada/J. Kuipers P.E.	What is the basis for the presumption of no post-closure maintenance or any activity past Year 10? Why are monitoring plans not being included in the EIS?
PC-44	Mining Watch Canada/J. Kuipers P.E.	What is the material balance of the organics stockpiles, and are "organics" = topsoil?
PC-45	Mining Watch Canada/J. Kuipers P.E.	The EIS, as well as the RCP and financial assurance estimate, should consider the potential for the ore stockpiles, in particular the LGO, to be left in place and not processed. A contingency for moving the LGO to the waste rock pile at closure should be considered in the event the company at some point were to abandon the mine.
PC-46	Mining Watch Canada/J. Kuipers P.E.	After review of the EIS with the expectation of locating these documents within its contents, the reviewer was unable to locate them. Without this information, a thorough review of the proposed TMF design is not possible. However, ultimately, we would expect to be disappointed in the level of detail provided for a pre-feasibility level TMF design. Based on our recent experience in performing technical reviews and working with independent review panels on multiple TSF design projects over the past 5 years, a higher level of design is necessary prior to permitting to provide the necessary basis for assessment. Otherwise, the purpose of the technical and independent review is compromised, as those reviews might decide to reconsider the siting location, dam design, or tailings methods proposed in the EIS. In particular, we would note that without a rigorous site characterization, geotechnical and geological hazards analysis, climate analysis, geohydrological analysis, as well as other critical information such as a detailed Rehabilitation and Closure Plan, the EIS must depend more on speculation and proposals for what is to be done, than on actual scientific findings of fact.
PC-47	Mining Watch Canada/J. Kuipers P.E.	This is the only location in this section of the EIS that addresses TMF lining other than suggesting earlier in the section that A geomembrane liner will be incorporated into the upstream slope of the embankment to retain water within the impoundment. The EIS should clarify if the primary purpose of the geomembrane liner on the upstream slope of the embankment is based on limiting seepage, or based on stability concerns related to allowing water to seep into the embankment. Depending on dense native tills and/or bedrock with low permeability characteristics to limit seepage is speculative, particularly in the absence of a reliable site characterization, and a preferable approach would be to use a geomembrane liner over the entire interior of the TMF. This alternative should be considered by the EIS.
PC-48	Mining Watch Canada/J. Kuipers P.E.	The GISTM contains specific requirements relative to each principle. We believe it would be highly informative for the project proponent and their consultant, and the responsible regulatory agencies, to perform a gap analysis for the project and its present status with respect to the GISTM Principles requirements. Performance of the gap analysis would show that the current level of design and information provided in the EIS is not consistent with those requirements and would provide the parties a sound basis for both resolving the inadequacies of the present EIS and as project plans proceed.
PC-49	Mining Watch Canada/J. Kuipers P.E.	Why is the downstream slope at 2.0H:1V with no benches, instead of a more preferable 2.5H:1V or 3H:1V slope, with benches, for rehabilitation and closure purposes?



VALENTINE GOLD PROJECT: PROVINCIAL INFORMATION REQUESTS

August 2021

IR Number	External Reviewer ID	Specific Question/ Information Requirement
PC-50	Mining Watch Canada/J. Kuipers P.E.	The outlined information provided in the EIS is insufficient to meaningfully inform the impact analysis for the EIS. The EIS provides detailed information with respect to the proposed construction and operations period over the initial 12-year period, but only cursory information is provided on the RCP that will be used to ensure for future generations restoration of lands, protection of water quality, and post-mining land use. As has been noted throughout the history of abandoned mine cleanup in Canada and elsewhere, the environmental as well as many of the societal issues with mining are most typically not associated with its operational period, but rather once mining stops, whether permanently or intermittently. Therefore, it is recognized that if the potential impacts of a mining project are to be assessed, adequate information must be provided and or otherwise developed for the full mine life-cycle, including reclamation, closure, and post-closure. This includes describing the site characteristics at the end of mining with respect to hydrology, geochemistry, and water quality, as well as the reclamation and closure plans for each individual facility, as well as the project site as a whole, that will be carried out to mitigate any impacts. It is widely recognized by industry, regulators, and scientists and engineers involved in mine design and permitting that it is critical that the entire life-cycle of mining, from cradle to grave, be addressed from the beginning of the process, rather than as an afterthought following initial permitting. As a result of the recognition of the need for this information in environmental assessments, when an application is submitted for a major mine permit, in nearly all cases, this project being a notable exception, a detailed stand-alone rehabilitation and closure plan, together with supporting information, is submitted with the application. In some cases, the reclamation and closure plan may also be accompanied by a financial assurance cost estimate. A detailed RCP is essential to a reasoned choice among the alternatives. The lack of a detailed RCP is a critical data gap in the EIS. Without this information, the EIS does not provide adequate context for assessment of impacts to wetlands, groundwater and surface water, or other impacts, including to wildlife, fish and aquatic resources, subsistence resources, and other human uses and activities, as it fails to provide specific rehabilitation and closure information necessary to develop a science-based finding as to post-mining impacts or mitigation. Given the critical need for this information the applicant should be required to provide a detailed RCP.
PC-51	Mining Watch Canada/J. Kuipers P.E.	The New Prosperity Guidelines required the EIS to include the following information:• proposed land use end objectives for the various mine site components;• productivity or capability objectives and the general means by which these objectives will be achieved; plans for removal of structures and equipment and remediation of contaminated soils;• plans for reclaiming roads and other linear disturbances;• waste rock dump and stockpile reclamation plans, including final configurations, proposed re-sloping, soil replacement, and revegetation methods;• tailings impoundment reclamation plans, including final impoundment configuration and water levels, re-sloping, soil replacement and revegetation methods;• open pit filling times and final configuration;• site water management plans for all facilities and including re-establishment of post-mine watercourses;• concepts for monitoring and research programs that will assess reclamation success and for meeting overall closure objectives;• conceptual monitoring programs for permanent structures to ensure long-term geotechnical stability;• conceptual long-term monitoring programs for surface and groundwater quality; and• management plans for final closure as well as temporary closure and/or early permanent closure.
PC-52	Mining Watch Canada/J. Kuipers P.E.	The EIS should contain a rehabilitation soils mass balance based on the proposed mine plan and conceptual RCP and consistent with the other data in the EIS. The EIS should contain the information necessary to perform this evaluation based on the disturbed area of the proposed facilities that in the future will be covered, and the amount of overburden and topsoil/organic material proposed to be stored (see EIS Table 2.7). However, as a notable exception to this EIS and any other of which this reviewer is aware, in this EIS's Section 2, there are almost no descriptions of the actual area or footprint of the proposed facilities/disturbed areas. Instead of a table containing the area of each facility (e.g., open pit, waste rock pile, overburden pile, topsoil pile, TSF, facilities, roads, man camp), the only area mentioned, apparently inadvertently as otherwise it is conspicuous that this key information is missing from the EIS, is on p. 2.59 where it is mentioned that the polishing pond would have a footprint of approximately 4.1 hectares.
PC-53	Mining Watch Canada/J. Kuipers P.E.	Typically, an EIS level RCP would identify the total thickness of the cover for each facility, and provide a materials mass balance showing how the required quantity of cover materials would be recovered and stockpiled for future use.
PC-54	Mining Watch Canada/J. Kuipers P.E.	A total cover thickness of 0.3m is marginal and technically infeasible in our experience. From a practical standpoint, given the relatively coarse gradation of the underlying waste rock and the proposed overburden cover materials, covered by a thin layer of organics, in order to achieve a minimum 0.3m cover thickness, an average cover thickness of 0.45m or more is required. If the cover material is available, most reclamation experts would prefer to have 0.6m of cover material as this also allows for long-term erosion and minimizes the need for cover replacement. It also should be noted that the idea with reclamation is to mimic the surrounding landforms and vegetation, and not just apply a veneer of cover materials as if the facility is an agricultural field. The EIS does not describe the revegetation process other than to suggest that during this stage the proponent would be Completing revegetation studies and trials. The EIS should provide a description of the intended studies and trials. It should also provide a conceptual or provisional revegetation plan describing the intended revegetation species, their distribution, the planting methods, and to what extent any amendments (compost, fertilizer, other) are intended to be used. This information is not only necessary to evaluate the potential effectiveness of the RCP measures, but additionally, as the proposed life of mine cannot be insured and therefore financial assurance must be required based on that eventuality, this information is needed to establish a cost estimate for that purpose.
PC-55	Mining Watch Canada/J. Kuipers P.E.	It would be advantageous if this sequence of events were to occur as it would allow for some level of TSF closure to occur while mine operations were still active. However, we would also note that as a result, the highest cost year for future reclamation, will likely occur in Year 9, should the operator for some reason, such as economics, cease the mining operation, and the government become responsible for the implementation of the RCP.
PC-56	Mining Watch Canada/J. Kuipers P.E.	While the opportunity to more rapidly fill the mined-out open pits over an eight-year period is generally favoured in order to shorten the time-frame of filling during which stability, safety and geochemical concerns are more prevalent, the potential need to conduct additional water treatment, particularly for the Leprechaun Pit after partial backfilling with tailings, should be considered in the RCP and EIS and in the financial assurance estimation.
PC-57	Mining Watch Canada/J. Kuipers P.E.	The description is general and non-specific except for suggestion that the piles will be sloped for final closure at three horizontal to one vertical (3H:1V).
PC-58	Mining Watch Canada/J. Kuipers P.E.	The RCP should be based on a post-closure water balance that estimates how long the water treatment plant and polishing pond components of the TMF will be required to operate, and the time-frame for converting the TMF to either an active or passive closure phase. The EIS does not make it clear as to whether the TMF will be closed as a wet facility. While the EIS does suggest as the Project progresses, Marathon will evaluate the tailings impoundment and consider options to further dewater the stored tailings working towards classifying the TMF as a landform (under the CDA closure guidelines) and therefore alleviating the requirements for maintaining and inspecting the dams post-closure this also suggests that otherwise the TMF will not be closed as a landform. This is reflected in the further statement in the EIS that Marathon will establish a plan for long-term inspection and maintenance of the dams. Given the present public awareness of the potential for catastrophic failures of TMFs the EIS does not even begin to provide adequate information to address this potential from the standpoint of rehabilitation and closure



VALENTINE GOLD PROJECT: PROVINCIAL INFORMATION REQUESTS

August 2021

IR Number	External Reviewer ID	Specific Question/ Information Requirement
PC-59	Mining Watch Canada/J. Kuipers P.E.	The EIS should be based on an RCP that identifies what stage of TSF closure is expected to be achieved and when in accordance with CDA recommendations. The EIS should also identify stable landform closure as an alternative for the TSF if it is not clear that the proposed action would result in that condition being achieved within a reasonable time-frame. The EIS should also address mitigation such as using intervention techniques (e.g., wick drains and loading with waste rock or borrow material) to achieve stable landform conditions.
PC-60	Mining Watch Canada/J. Kuipers P.E.	In terms of post-closure management, the proposed Valentine Project will require extensive monitoring and maintenance. Monitoring should include water quantity, water quality, fish, wildlife, aquatic biota, revegetation, erosion, dam stability, and other monitoring to ensure that rehabilitation and closure measures are performing as intended and within acceptable standards. Monitoring would also determine when maintenance and corrective actions are needed to maintain roads, covers, stormwater channels, and other measures to ensure that reclamation remains viable over time. These monitoring and maintenance activities, in addition to operations that will be performed in perpetuity, and should be described in the EIS in detail.
PC-61	Mining Watch Canada/J. Kuipers P.E.	Rather than just mention adaptive management planning, given the high degree of uncertainty around any major mining project, the project proponent should have provided a preliminary Adaptive Management Plan (AMP) that could be weighed as an additional and critical mitigation measure.
PC-62	Mining Watch Canada/J. Kuipers P.E.	The EIS should recognize that this alternative would result in at least partial restoration of the original surface contours and hydrology of the open pit area. The requirement for progressive rehabilitation should not be used as a rationale as there is no question if the proponents were to later propose on their own removal of a waste rock pile, they would be given consideration to do so.
PC-63	Mining Watch Canada/J. Kuipers P.E.	As the removal of waste rock back to the open pit would involve a downhill haul, versus an uphill haul when the pit was excavated, there would be a significant reduction in time, fuel consumption, and vehicle emissions as well as employment. This suggests the EIS is incorrect. In making statements throughout the EIS as "a nearly equal number of years," the EIS should instead provide an actual estimate based on a scientific study rather than force the reviewer to rely on broad unsupported generalizations.
PC-64	Mining Watch Canada/J. Kuipers P.E.	The EIS is understating the potential benefit of pit backfilling related to highwall stability. Simply put, if the backfilling is complete and results in no exposed highwalls, there is no credible risk of highwall slope failures. Pit backfilling would serve to permanently and completely buttress the highwalls and prevent this from possibly happening.
PC-65	Mining Watch Canada/J. Kuipers P.E.	The EIS inaccurately describes the settlement due to differential consolidation of the waste materials as "creep" settlement. As noted in Fell et al6 (2000) creep settlement takes place on slopes (e.g., waste rock pile slopes). But if the pit is backfilled such that the waste rock is not significantly sloped, creep will not occur. However, differential settlement of waste rock when not compacted is common, and will likely cause the surface of the pile to settle unevenly. However, we would note that this same process will occur on the waste rock piles themselves, as well as the TMF, and must be accounted for in all rehabilitation measures. In rehabilitation plans this is often addressed by mounding the materials so as to achieve positive drainage off the facility even after differential settlement occurs. Additionally, it must be accounted for in long-term monitoring and maintenance plans and if settlement occurs over the long-term that negatively impacts the environment or post-mining land use, repairs must be made.
PC-66	Mining Watch Canada/J. Kuipers P.E.	Instead of relying on this unsupported statement, the EIS should provide an estimated cost of backfilling, and include an evaluation that conduct a sensitivity analysis showing how the estimated cost would actually impact the project economics in terms of net present value and rate of return.
PC-67	Mining Watch Canada/J. Kuipers P.E.	As previously described in the EIS, the Leprechaun open pit is to be exhausted in Year 9, at which time tailings will be deposited in the pit, and the tailings will not be expected to completely fill the pit during the remaining mine life. The EIS should address the alternative for the waste rock produced from the Marathon pit from Year 9 to Year 12 to be included as backfill in the Leprechaun open pit together with tailings. This would result in a more complete pit backfill of the Leprechaun open pit and the corresponding benefits.
PC-68	Mining Watch Canada/J. Kuipers P.E.	The alternatives assessment guidelines include an alternatives assessment process that includes the following steps: Step 1: Identify Candidate Alternatives Step 2: Pre-Screening Assessment Step 3: Alternative Characterization Step 4: Multiple Accounts Ledger Step 5: Value-Based Decision Process Step 6: Sensitivity Analysis Step 7: Document Results Instead of relying on a stand-alone siting study and unsupported opinions as to the viability of tailings disposal alternatives, the EIS needs to be informed by an assessment of alternatives that conforms with the recommended guidelines.
PC-69	Mining Watch Canada/J. Kuipers P.E.	Potential additional care and maintenance measures that should be considered and analyzed in the EIS to minimize long-term liability of reclamation uncertainties include long-term settlement of the waste rock piles and TSF, functionality of stormwater drainage channels and sediment ponds, stability of the TSF and other constructed river channels, and effects from climate change. As previously recommended, the EIS should be based on a more detailed RCP, and the RCP should also include a preliminary financial assurance cost estimate.
PC-70	Mining Watch Canada/J. Kuipers P.E.	Given the location and circumstances, if the project proponent cannot commit to a landform classification for the TSF post-closure, ensuring long-term stability without intervention, then additional consideration should be given to require all tailings to be stored in-pit or filtered.
PC-71	Mining Watch Canada/J. Kuipers P.E.	While the methods used are an improvement over previous industry practice of suggestion zero-leakage, and acknowledge that liner do have the potential for fail, the methodology itself is not conservative and tends to underpredict liner leakage. Most often this is due to the presence of a more significant failure than used to estimate leakage, such as a seam failure or liner rip, or pipe coupling failure. It can also be due to the presence of multiple failures rather than a single failure. Based on our professional experience, when liners do leak, the discharge rates are typically one to two orders of magnitude (10-100X) more than typically estimated. It should also be noted that when liner leakage is detected, the range of subsequent mitigation can result in complete repair to no significant improvement depending on the nature of the source of leakage. The level of mitigation is largely based on access to the seepage. For these reasons, we strongly recommend that the TMF utilize a liner system to minimize seepage, but the system should include a leak detection and evacuation provision given the inevitability of liner leakage.
PC-72	Mining Watch Canada/J. Kuipers P.E.	The suggestion of conservatism in the estimates during operations, without mention of post-closure, suggests that the same methods are not conservative in estimating post-closure water quality or quantity. The EIS should clarify, and as mentioned elsewhere in our comments, the EIS should address post-closure with equal emphasis as closure through the discussion.
PC-73	Mining Watch Canada/J. Kuipers P.E.	This suggests specific ML management of waste rock will be required, or at least should be considered from a contingency and adaptive management standpoint. The EIS should explain why only "high leaching potential" is being addressed and why concentrations that exceed Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (CWQG-FAL) between the CWQG-FAL and ten times the CWQG-FAL value, were arbitrarily assigned to moderate leaching potential. Further, the EIS should explain why moderate leaching potential is being treated in the EIS as having no impacts or consequences.



VALENTINE GOLD PROJECT: PROVINCIAL INFORMATION REQUESTS

August 2021

IR Number	External Reviewer ID	Specific Question/ Information Requirement
PC-74	Mining Watch Canada/J. Kuipers P.E.	Blending and encapsulation of PAG can be effective; however, actual implementation has been shown to require planning and diligence. The EIS should be supported by a conceptual waste rock management plan (WRMP). The conceptual WRMP should be developed based on the geochemical characterization program that has been completed to-date. This conceptual WRMP should be closely integrated with other management plans that have, or will be, developed as part of the Project. The EIS should note that geochemical characterization will continue during the life of mine (LOM) and the results will be used to inform adaptive management and update the WRMP.
PC-75	Mining Watch Canada/J. Kuipers P.E.	The information provided in the EIS with respect to acid drainage accounting is confusing and requires additional analysis by the reviewer, as well as additional information, to be comprehensible or meaningful. Based on the information in the EIS, an estimated 46% of the tailings would be PAG, and 54% would be non-PAG. It is unclear in the EIS if the basis of “composite samples” is from a similar mass balance, or from actual composite samples of tailings. Regardless, the relatively small difference between the quantity of PAG and non-PAG in this instance does not demonstrate or suggest that the tailings overall will be not be acid drainage generating. The EIS should provide additional information for the tailings that demonstrates if neutralization potential (NP) is in excess of acid potential (AP). Additionally, the EIS should discuss and address the potential for lenses of acid-generating material to occur in the TMF. Finally, the EIS should address as a potential mitigation measure the isolation of acid-generating flotation concentrate material in the tailings stream and location within the TMF. The EIS should also address the possibility of using the mined-out Leprechaun Pit as a submerged repository for flotation concentrate, albeit requiring re-handling of the first 9 years of concentrate stored separately for later deposition.
PC-76	Mining Watch Canada/J. Kuipers P.E.	While revegetation will reduce seepage from un-revegetated conditions, such as during operations, the amount of reduction may or may not be significant in reducing seepage overall from the waste rock piles or TMF. In a climate like that of the project site the overall benefit in terms of reducing seepage is likely to be minimal in terms of addressing potential water quality impacts. Where impacts are likely to occur, a more sophisticated approach such as an engineered cover might be necessary. The actual amount of reduction is based on numerous factors including precipitation, evaporation, plant evapotranspiration and other climate conditions. The EIS should have included an evaluation of the amount of infiltration that would be expected to occur after revegetation and the estimated benefit overall of revegetation to address seepage should be estimated and stated, including any uncertainties in the estimate.
PC-77	Mining Watch Canada/J. Kuipers P.E.	<p>The identification of the limitations that result in model predictive uncertainties with respect to this project are beyond the scope of this review. The EIS models should be independently reviewed, and with respect to the hydrologic model, the following determined:</p> <ul style="list-style-type: none"> • Was the number of hydraulically tested wells and boreholes adequate? • Are there limitations of the data derived from the completed hydraulic testing related to the scale of the tests? The EIS needs to make clear that there is uncertainty inherent in the model predictions. Ideally, their use would be limited to comparison of alternatives, as there is uncertainty regarding whether current best practices are sufficient to provide confident predictions of actual water quantity or quality decades or centuries in the future (Kempton et al. 2000; Kuipers, et al 2006; Maest et al. 2006; Eary et al. 2009; and NRC 1999). While the predictive water quantity and quality models are useful to understand the general water quality that may be present decades or centuries in the future, they are only estimates, and the level of uncertainty in the model predictions cannot be fully quantified. The EIS needs to address whether predictions made by the models had a level of uncertainty that could bear on the significance of a predicted impact. Uncertainty with respect to long-term predictions in particular needs to be acknowledged and addressed by the EIS. • Were any of the fault zones near the proposed pits hydraulically tested? • Was the model evaluated to predictive sensitivity to various possible degrees of hydraulic transmissivity of fault zones? • Is the spatial distribution of wells with measured groundwater level adequate?
PC-78	Mining Watch Canada/J. Kuipers P.E.	At the very least a preliminary groundwater monitoring program showing proposed monitoring wells and procedures should have been developed for and described in the EIS. The preliminary groundwater monitoring program should have been provided to solicit public comment via the EIS that could be addressed and/or incorporated into the detailed groundwater monitoring program to be done in the future. The preliminary groundwater monitoring program would allow the reviewer to assess the likely effectiveness of the program.
PC-79	Mining Watch Canada/J. Kuipers P.E.	As previously suggested in these comments, the basis for this section should be an FMEA together with a catastrophic failure scenario consistent with CDA guidance. The present approach of the EIS leaves the suggestion that the project proponent is both not well informed as to TMF management and safety and best practice. The EIS fails to note that none of the three most recent catastrophic dam failures (e.g., Mt. Polley, Samarco, and Fundão) were due to overtopping, or that the Fundão failure was of a supposedly closed TSF. Ultimately, given the uncertainties and their potential as credible failure modes, a worst-case failure involving a foundation failure, resulting in an instantaneous release of a significant amount of the tailings and process water mass, should be identified and considered by the EIS, and the effects evaluated based on a breach inundation analysis and breach effects analysis consistent with CDA guidance.
PC-80	Mining Watch Canada/J. Kuipers P.E.	The EIS does not appear to be supported or utilize a risk management strategy approach consistent with the recommendation of MAC. Recommend the permittee be required to perform a multi-stakeholder Failure Modes Effects Analysis (FMEA) ¹¹ to identify the potential failure modes and effects as well as potential mitigation measures to address this section.
PC-81	Mining Watch Canada/J. Kuipers P.E.	The EIS should provide some type of basis for the assumptions used. The use of “the average range” followed by a specific number is not logical. Why wasn’t the worst case of an entire truck load of diesel fuel spilled? Similarly, what is the basis for the relatively small amount of sodium cyanide spilled when shipments will be much larger? The quantities modelled are not consistent with a “worst case scenario.”
PC-82	Mining Watch Canada/J. Kuipers P.E.	Consistent with the recommendations of the Initiative for Responsible Mining Assurance, the proponent should indicate in the EIS that they are a signatory to the Cyanide Code and in addition agree to meet the following design criteria: Construction – (a) Impermeable secondary containment for cyanide unloading, storage, mixing and process tanks shall be sized to hold a volume at least 110% of the largest tank within the containment and any piping draining back to the tank, and with additional capacity for the design storm event; and (b) Pipelines containing process solution shall utilize secondary containment in combination with audible alarms, interlock systems, and/or sumps, as spill control measures. Discharges – Discharges to a surface water mixing zone shall not contain cyanide, either alone or in combination with other toxins, that will be lethal to resident aquatic life or interfere with the passage of migratory fish. Monitoring – The operating company shall carry out baseline water quality sampling and monitor discharges to surface waters or groundwaters for weak acid dissociable (WAD) cyanide. If WAD cyanide is detected in discharges to surface waters, then the operating company shall also monitor total cyanide, free cyanide, and thiocyanate levels. Reporting – Cyanide water quality monitoring data shall be published on at least a quarterly basis in tabular format, and graphical format if available, on the mine or the operating company website, or provided to stakeholders upon request.



VALENTINE GOLD PROJECT: PROVINCIAL INFORMATION REQUESTS

August 2021

IR Number	External Reviewer ID	Specific Question/ Information Requirement
PC-83	Mining Watch Canada/J. Kuipers P.E.	The descriptions reliance on waste rock alone to support the consideration is incomplete. The EIS needs to explain, and provide a mass balance, showing how this would result including accounting for the material removed from the open pit as ore and after processing stored as tailings. We would have to assume that a bulking factor was used such that theoretically 60% of the material excavated from the pit could be returned to fill the same volume, and that the estimation of 70-80% is based on also accounting for the removal of ore which ends up as tailings.
PC-84	Mining Watch Canada/J. Kuipers P.E.	<p>“The following generalized approach is proposed for developing a sustainable final landform design for existing waste rock stockpiles:</p> <ol style="list-style-type: none"> 1. Determine the final land use for the rehabilitated site through consultation with all stakeholders, and an assessment of potential geologic or structural control elements for the landform; 2. Observe and collect data on a nearby natural landscape (a natural analogue) to determine hillslope forms and gradients, soil and vegetation types, drainage density, and watershed characteristics; 3. Determine the long-term eroded profile for the various slopes of the existing stockpile through erosion and landform evolution numerical modelling; 4. Based on the maximum slope length and gradient as determined from Steps 2 and 3, design a methodology for reshaping the existing stockpile to conform to these requirements (a horseshoe-shaped landform, which creates a small well-defined catchment, can be effective in reducing slope length and gradients without changing the footprint of an existing stockpile) 5. Design a surface water management system to safely convey meteoric water off the final landform, and ensure runoff reaches final discharge points in volumes and at velocities that will not cause unacceptable erosion or sedimentation; 6. Develop a final landform design following completion of Steps 2 to 5 inclusive, taking into consideration the long-term safe storage of reactive or hazardous materials. 7. Develop a revegetation plan suitable for the swales and ridges in the final landform based on data collected in Step 2; and 8. Review the final landform design with key stakeholders for general acceptance prior to implementation.” <p>“The following guidelines are proposed to aid in the development of a sustainable final landform design for waste rock stockpiles.</p> <ul style="list-style-type: none"> • Design the final landform using natural analogues as described in Keys et al. (1995). The reclaimed landscape can be no more stable than the adjacent undisturbed landscape; therefore, the designer can assume that the reclaimed area will be less stable and design accordingly, with gentler slopes, higher density drainage and smaller drainage basins. • Maintain the final landform height and slope angles for stockpiles in areas of low relief as low as possible. Where slopes compatible with the surrounding landscape cannot be achieved, an attempt should be made to visually soften steeper areas by avoiding straight “engineered” ridges and sharp changes of angle, and by careful planting of trees to break up views of the horizon (Environment Australia, 1998). • The preferred reclaimed slope design is a “spur-end” slope plan with a concave or complex (convex-concave) profile. The use of terraces or contour banks should be avoided. It is very difficult in practice, particularly for stockpiles with long slopes, to construct concave slopes with continual curvature on a waste rock stockpile. However, hillslope curvature can be obtained using a series of linear slopes or slope facets as shown in Fig. 3. Hancock et al. (2003) demonstrated through simulations with a landform evolution model that there is minimal difference in sediment loss between a hillslope constructed of linear facets and that constructed from continual curvature. • Erosion and subsequent evolution of the proposed final landform design(s) should be predicted over a period of at least 100 years using state-of-the-art software packages. • The thickness of earthen covers designed to minimize the entry of atmospheric oxygen and/or meteoric water to reactive or hazardous material should not only be based on soil-atmosphere numeric simulations, but should also take into consideration the predicted long-term erosion from the final landform (e.g., see Ayres et al. (2005)). • The design of surface water drainage courses should be based on the discharge and sediment load of the receiving stream(s). Drainage channels used to convey surface water off the top of the landform should follow the slope gradient of the final landform as much as possible. The use of imported substrate as well as man-made materials such as pipes, gabions, and concrete should be avoided whenever possible. • Design conservatively to account for excessive erosion resulting from extreme climatic events and differential settlement in the reclaimed landform. • Reclamation of large waste storage facilities should include the construction of small lakes and wetlands upstream of final surface water discharge points, provided they are geomorphically compatible and stable. Such features will attenuate surface runoff to reduce peak flows and increase sedimentation prior to reaching receiving streams (Sawatsky, 2004).”
PC-85	Mining Watch Canada/J. Kuipers P.E.	In our experience the actual contribution of physical or chemical attenuation processes in groundwater is highly speculative and typically of minimal consequence. Therefore, the approach used for the EIS is not conservative because it does not consider physical or chemical attenuation processes, but simply scientifically credible. The inclusion of unproven or unmeasurable processes in a model would be unscientific, and not less conservative.
PC-86	Mining Watch Canada/J. Kuipers P.E.	The ability of geochemical testing to accurately predict long-term water quality or quantity is highly uncertain, as are all water predictions. Geochemical testing is carried out under highly idealized conditions and while it is considered useful, it is not conclusive. See further comments re Section 6.7, Prediction Confidence.
PC-87	ASF	We submit there is a strong likelihood that the life span of this mine will be extended well pass the initial time frame that was proposed, meaning even greater quantities of water will likely be withdrawn than originally planned. We submit that cumulatively, the removal of such large volumes of water during the life span of this mine, will likely have a significant impact on fish and fish habitat in these watersheds. Similarly, ASF submits that the risks associated with the discharge of such huge volumes of water annually from the mine into the adjacent watersheds (even after water treatments that the company plans to undertake) still represents a significant risk to fish and fish habitat since this wastewater is by no means pure. In addition, there are also risks associated with the malfunction of the water treatment systems as well as human error, to consider. Again, ASF submits that cumulatively, the discharge of such deleterious substances in the wastewater over the life span of this mine, and the potential for malfunctions of water treatment equipment, together pose a significant risk to fish and fish habitat in adjacent lakes and to the rivers downstream.



VALENTINE GOLD PROJECT: PROVINCIAL INFORMATION REQUESTS

August 2021

IR Number	External Reviewer ID	Specific Question/ Information Requirement
PC-88	ASF	ASF believes that the Marathon Gold Project has the potential to have a significant impact on fish and fish habitat. In fact, the proponent acknowledges that 186,705 square meters of pristine fish habitat will be lost in the immediate area of the mine site. What we do not know is what the downstream impacts from the mine will be on the Exploits River and both the Grey River and White Bear River. As such, we were disappointed that the provincial and federal governments did not require the proponent to assess these potential downstream impacts as part of their Environmental Impact Assessment, especially considering wild Atlantic Salmon was identified by them as a Valued Ecosystem Component (VEC) in the TOR for the EIS. ASF submits that one cannot adequately identify and/or quantify the potential downstream impacts associated with this undertaking unless they are properly studied and assessed. Nor can appropriate mitigation measures be developed and implemented without such information. Considering the magnitude and duration of this project, and the potential for significant risks to fish and fish habitat downstream in these watersheds, it is a major oversight that these potential downstream impacts were not assessed, and no mitigation plans developed accordingly. We do acknowledge that the proponent indicated to us during a recent meeting that they expect no downstream effects from water removals, discharges, or accidents. While this may very well be true, we would have felt more comfortable with the project if potential downstream effects had been formally assessed and any conclusions about the risks to salmon downstream had been supported by an assessment.
PC-89	ASF	The proponent has since initiated and held a number of meetings with the wildlife division in hopes of developing a mitigation plan to protect these caribou, that would be satisfactory to the wildlife division. However, there is no indication that such a mutually agreeable mitigation plan was developed to protect these caribou from the impacts of the mine. We do know that the proponent did submit a mitigation plan in their EIS, but the question that remains is, will it be effective?
PC-90	ASF	While ASF is not an authority when it comes to caribou populations, or caribou management, we do participate regularly in public information sessions and updates presented by the Wildlife Division annually regarding caribou populations on the Island of Newfoundland, and in Labrador. Therefore, we know that most caribou populations throughout NL have been declining in recent years and are currently at very low levels. We also know that there is little scientific information to suggest that these populations are recovering. Rather, at best, evidence suggests that a couple populations may have stabilized or seen a very slight increase in numbers. We also know from the scientific literature that caribou populations are very sensitive to changes to their natural environment, particularly from mining, often with negative consequences. Having looked at the mitigation plan presented by the proponent in their EIS we are not yet confident that this plan will be effective at preventing significant impacts to these caribou herds.
PC-91	Salmonid Association	The amount of HADD (habitat alteration, disruption or destruction) has not yet been quantified. The amount of HADD for the project site and the road should be established as part of this EIS, otherwise the full extent of the environmental impact(s), including sustainability and productivity of fisheries and fish habitat cannot be established or assessed.
PC-92	Salmonid Association	The proponent should clearly state where any water, chemicals or site runoff from all areas of the site will discharge into in the event of any spill, accident or upset event and what remedial procedures will be employed in that event.
PC-93	Salmonid Association	Follow up monitoring programs to be conducted should include studies on effects of all site discharges on salmonid species.
PC-94	Salmonid Association	Sampling of effluents from all identified discharge points to fish bearing waters should be conducted by dedicated personnel and all samples analyzed by accredited laboratories.
PC-95	Salmonid Association	SAEN is encouraged that the proponent commits to consulting with salmonid conservation groups on fish habitat offsetting proposals and would desire to be included in such consultations.
PC-96	Salmonid Association	SAEN would desire an opportunity to review and comment on pollution prevention plans and accident prevention plans that are required as part of a permitting process given those plans will address the details that are most pertinent to the protection of salmonid species.
PC-97	Salmonid Association	Given the legacy of abandoned mines in NL and their on-going impact on water resources and salmonid species that inhabit those waters, it is strongly recommended that a Financial Bond is put in place which will cover the critical aspects of mine decommissioning and long-term care of the site tailings management facility.
PC-98	Resident	Thank you for the opportunity to provide comments on the Valentine Lake project. I am a resident of a neighbouring community to the proposed mine. I have read the entire EIS submitted by Marathon Gold. I believe they have done the due diligence and study to ensure that the project will have minimal impact. I am in favour of this project and look forward to reading the results of the EIS submission.
PC-99	Resident	Please do not allow a short-term economic boost to endanger woodland caribou. There will be other mines and sometimes a gold deposit is just in the wrong place. This may be one of those times. Listen to the people who we pay to observe, protect and understand our caribou. Future generations will mourn the loss and curse our shortsightedness if we do not protect the natural world.

