new graph environment
Environmental Research & Consulting

Al Irvine
New Graph Environment
al@newgraphenvironment
250-777-1518
Date: 2021-07-24

Safety Plan - 2021-041-nupqu-elk-fish-passage

The latest version of this pdf can be downloaded here.

A zip file which includes kml (google earth) and gpx (garmin) files of the sites to be potentially assessed can be downloaded here. Georeferenced pdf maps can be accessed and downloaded here.

project_number	project_name
2021-041	nupqu-elk-fish-passage

Table 1: Crew members details and emergency contacts

name	email	phone	satellite	emerg_name	emerg_email	emerg_phone
Al Irvine	al@newgraphenvironment.com	250-777-1518	allanirvine75@inreach.garmin.com	Tara Stark	tara.stark@gmail.com	250-505-9854
Tammy Strauss	tamlee1@yahoo.com	250-551-5958	–	James Karthein	ridgelinemetalworks@yahoo.ca	250-551-4776

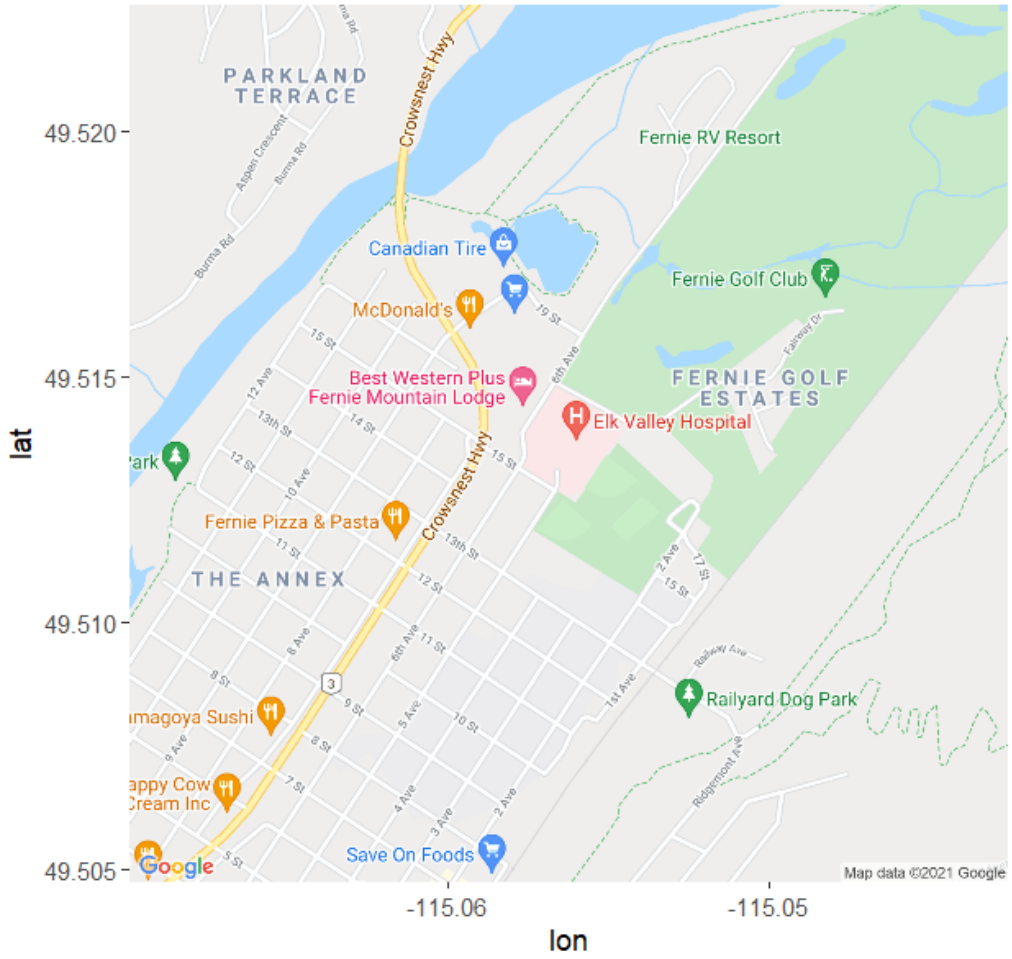
Equipment Checklists

Personal Equipment Checklist	•
GPS	Ski poles
Suncreen	water
Bugspray	food
Polarized glasses	gloves work
Bear Spray	glasses safety
phone/camera	headlamp
battery pack booster for phone	clinometer
Hat	field vest
first aid kit personal	note book
Waders	Extra clothes
Boots	rain gear

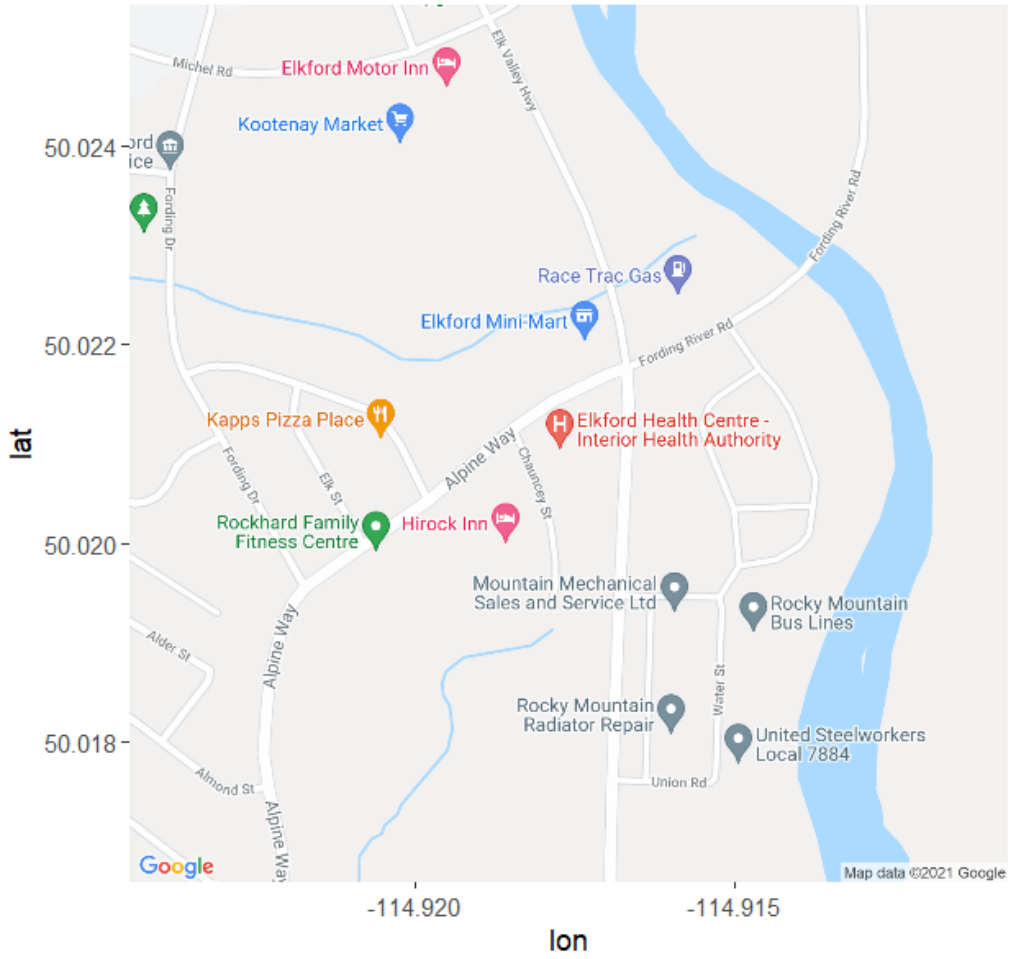
Crew Equipment Checklist	•
Hand saw	Measuring board
Linesman Gloves x 3	Scale
Backroads Mapbook	Permits
Locational maps	Fish ID book
Background Documents	Site Cards / Field Guide
radio road	Minnow Traps
Inreach	Catfood
Field Safety Plan	Flagging
first aid kit level 1	Laptop w/basecamp
First Aid binder stocked	GPS cable
Throw bags	Lazer level
polaski	Assessment cards fish passage
shovel	UAV
fire extinguisher backpack	Flow meter
fire extinguisher pressurized	ATV
Oakton Multimeter	bucket rigid x 2

Backpack Electrofisher	bucket foldable
stop nets x 4	clove oil kit w/ instructions
salt blocks	gloves leather
loose salt	sharpies
dip nets x 2	hand lens
tape measure hand	ATV gas
tape measure eslon	ATV lock
pilon x 2	UAV battery charger

Nearest Hospitals



Elk Valley Hospital - 1501 5 Ave, Fernie, BC V0B 1M0 - 250-423-4453



Elkford Health Centre - Interior Health Authority - 212 Alpine Way, Elkford, BC V0B 1H0 - 250-865-2247

Field Plan

Field work methods will result in products feeding reporting formats such as the 2020 deliverables and will generally follow procedures in:

- fish passage assessments
- habitat confirmations

Presence/absence of fish, species composition/density and distribution limits can be useful for prioritizing which crossings are a best fit for fish passage restoration and help inform follow up

monitoring so electrofishing and minnowtrapping may be conducted. Standard Fish and Fish Habitat Inventory Standard Field Form site cards are used to gather habitat data.

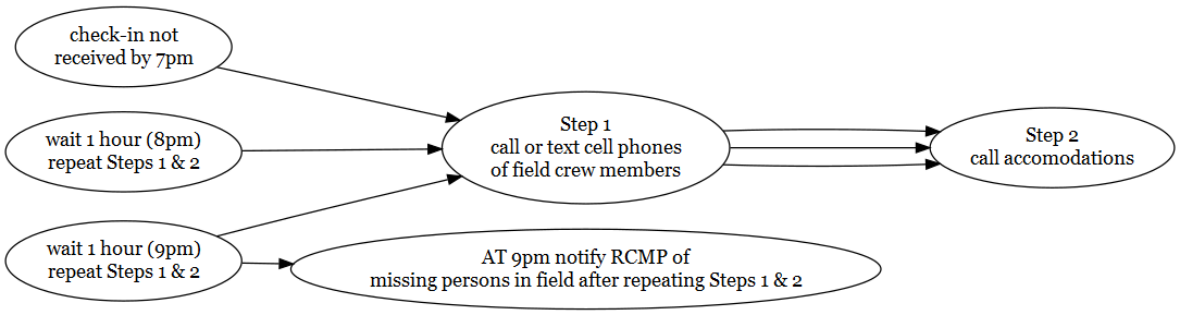
A summary of sites to be potentially assessed is included as Table **??** and an overview map of displaying potential sample locations is included as Figure 1.

Check In Procedures

Call, text or inreach Tara Stark (2505059854) each morning to share the plan for the day (i.e. name of roads and sites). Check in time is before 7 pm each evening although we regularly check in throughout the day (ex. at arrival to site, 1pm and 4pm) on the inreach or by text and report position/provide updates.

Procedures for Failed Check-In - for Check in person

Procedures are summarized in the following Figure. If phone call or inReach check-in is not received by 7pm send text to inreach units, call or text cell phones of field crew members. If no response please call accommodations then personal emergency contacts to see if they have heard anything. Wait 1 hour and text inreach, text or call cell phones and personal emergency contacts and accomodations again. Repeat after 2 hours (9 pm) - if no response then notify the RCMP of a missing persons in field.



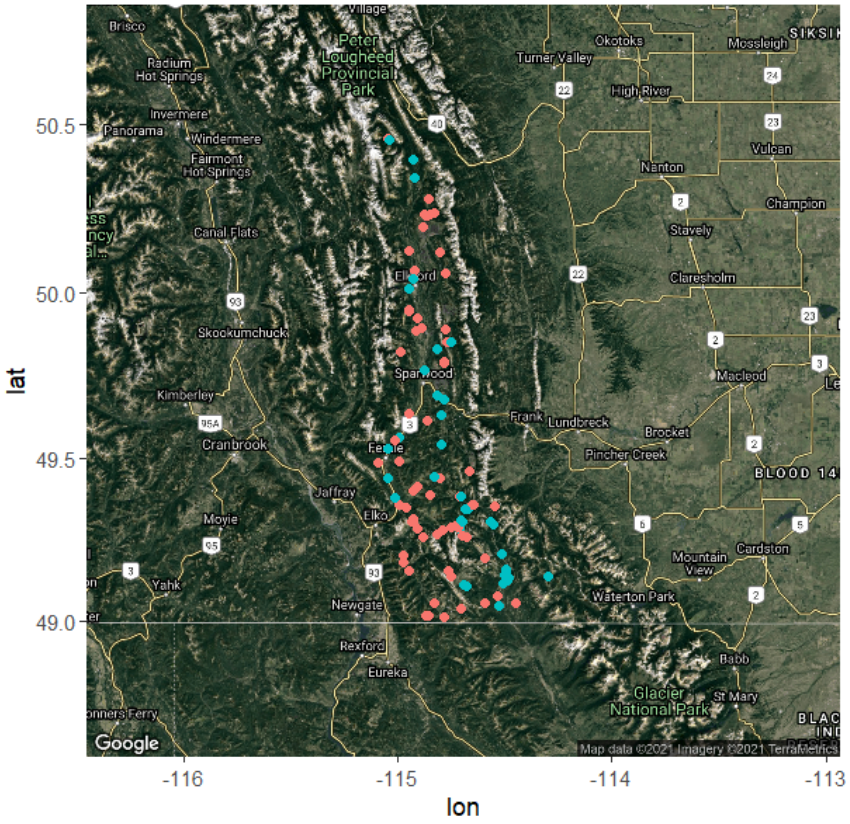


Figure 1. Map of potential sampling areas. High priority sites in red and moderate priority in green.

Table 2: CWF - Potential sample locations.

id_xing	Stream	east	north	source	id_map	comments	sp_upstr
61504	Coal Creek	645312.9	5483687	cwf	082G.113	–	{BT,CT,CT/RB,WCT}
197527	Crossing Creek	648724.3	5548196	cwf	082J.103	–	{EB}
1004600533	Chauncey Creek	656890.0	5554160	cwf	082J.103	–	{WCT}
1004600762	Fording River	651282.0	5562574	cwf	082J.103	–	{WCT}
1004601280	–	659427.0	5517583	cwf	082G.119	–	{WCT}
1004601704	Morrissey Creek	650166.0	5473852	cwf	082G.108	–	–
1004601984	–	654301.7	5458678	cwf	082G.108	–	–
1004601993	Rabbit Creek	656655.0	5431721	cwf	082G.103	–	–
1004601995	Rabbit Creek	655890.2	5431860	cwf	082G.103	–	–
1004602163	Morrissey Creek	651609.1	5475661	cwf	082G.113	–	–
1004602359	Rabbit Creek	655618.0	5431721	cwf	082G.103	–	–
1004602514	Harmer Creek	659393.0	5517830	cwf	082G.119	–	{WCT}
1004602646	–	647364.0	5452095	cwf	082G.108	–	–
1004602949	Weigert Creek	647247.0	5534524	cwf	082G.123	–	–
1004603334	Fording River	651460.9	5566706	cwf	082J.108	–	{WCT}
1004603413	Henretta Creek	654825.0	5567436	cwf	082J.108	–	{WCT}
1004603480	Bean Creek	650539.0	5464640	cwf	082G.108	–	–
1004603553	Bighorn Creek	663230.0	5447429	cwf	082G.104	–	{DV}
1004603791	–	660586.0	5461227	cwf	082G.109	–	{WCT}
1004603793	Lodgepole Creek	663619.0	5462235	cwf	082G.109	–	{WCT}
1004604677	Henretta Creek	652123.3	5566424	cwf	082J.108	–	{WCT}
1004604696	Henretta Creek	652346.1	5566461	cwf	082J.108	–	{WCT}
1004605216	–	647730.0	5449516	cwf	082G.103	–	–
1004605338	–	658388.0	5436172	cwf	082G.103	–	–
1004605499	–	650057.1	5463543	cwf	082G.108	–	–
1004605937	–	662247.0	5431294	cwf	082G.104	–	–
1004606007	Weigert Creek	647156.3	5534676	cwf	082G.123	–	–
1004606129	–	649481.2	5446732	cwf	082G.103	–	{BT,CT,RB,WCT}
1004606284	Fording River	652990.0	5571951	cwf	082J.108	–	–
1004606347	Bean Creek	650414.6	5463819	cwf	082G.108	–	–
1004606370	Lodgepole Creek	664905.1	5462562	cwf	082G.109	–	{WCT}
1004606398	Lodgepole Creek	665796.1	5462152	cwf	082G.109	–	–

1004606411	–	658765.0	5459547	cwf	082G.108	–	{WCT}
1004606926	Bighorn Creek	664112.2	5445241	cwf	082G.104	–	–
1004607022	McCool Creek	648168.1	5499879	cwf	082G.118	–	{WCT}
1004607449	–	659283.9	5547544	cwf	082J.104	–	–
1024706614	Henretta Creek	653180.2	5566732	cwf	082J.108	–	{WCT}
1024733953	–	652220.8	5461435	cwf	082G.108	–	–
1024734790	Brûlé Creek	649910.2	5528007	cwf	082G.123	–	{RB,WCT}
1024735049	Weigert Creek	650009.9	5531958	cwf	082G.123	–	–
1024735443	Abruzzi Creek	638867.1	5591423	cwf	082J.113	–	{WCT}

Table 3: 2020_field_planning - Potential sample locations.

id_xing	Stream	east	north	source	id_map	comments	sp_upstr
50060	Harvey Creek	666579.3	5461445	2020_planning	082G.109	Harvey Lake is 1ha lake upstream ~230m upstream of the crossing.	–
50061	Fuel Creek	667651.2	5459223	2020_planning	082G.109	Large stream but dry during assessment. WCT known upstream and wetted at 50151 (ford) located 600m upstream.	{WCT}
50063	Kisoo Creek	668960.5	5458806	2020_planning	082G.109	Relatively large channel width. Good flow and hab value rated high.	–
50072	–	682784.9	5447731	2020_planning	082G.104	Small stream with good flow in photos. Assessment comments indicate good gravels. Very close to the mainstem of the Flathead.	–
50073	–	682180.0	5446356	2020_planning	082G.104	Fairly steep. comments indicate “WCT found upstream by Artech in 1995 according to Habitat Wizard”	–
50075	–	683797.4	5445297	2020_planning	082G.104	Smaller stream.	–
50081	–	681879.8	5443723	2020_planning	082G.104	Large stream. Potential barrier.	–
50084	–	680147.4	5439436	2020_planning	082G.104	Fish observed at outlet. Falls in FISS just downstream. Culvert appears passable to all life stages/species at time of survey but may be velocity barrier at higher flows.	–

50085	–	680488.4	5435930	2020_planning	082G.104	Larger channel width habitat rated as high value.	–
50086	–	680428.7	5435744	2020_planning	082G.104	Appears passable at most flows. Rocky mountain sculpin nearby and their swim speeds could be a consideration.	–
50100	–	669510.1	5442206	2020_planning	082G.104	Larger stream but fairly steep with relatively low habitat gain potential.	–
50101	–	669469.8	5442312	2020_planning	082G.104	Larger stream with good flow. Gradients model as >15 downstream so naturally occuring barriers are fairly likely.	–
50102	–	668217.8	5442479	2020_planning	082G.104	Good flow but very steep then extremely steep upstream.	–
50152	–	638002.9	5483401	2020_field	082G.113	–	–
50181	–	648276.6	5468171	2020_field	082G.108	–	–
50185	–	645679.3	5469020	2020_field	082G.108	–	–
50261	–	669029.6	5481120	2020_field	082G.114	–	–
50273	Robert Creek	657671.1	5506277	2020_planning	082G.118	Dry channel. Small stream.	–
62120	–	676693.1	5464482	2020_planning	082G.109	Small potential habitat gain but assessment comments indicate good rearing habitat and good potential fix candidate.	–
62265	–	647692.6	5578674	2020_planning	082J.108	Splits upstream and gets very steep. Grainger indicates “Good potential for fix. Rearing habitat upstream.”	–
62423	Grave Creek	660493.7	5524263	2020_field	082G.124	–	{RB,WCT}
62425	Grave Creek	661478.0	5524388	2020_planning	082G.124	If this is the mainstem, habitat upstream at bridge appears mod to high value.	{WCT}
62425	Grave Creek	661478.0	5524388	2020_planning	082G.124	Good flow in photos. Smaller channel width. Not on mapped stream location	{WCT}
62425	Grave Creek	661478.0	5524388	2020_planning	082G.124	Smaller channel width. Stream incorrectly mapped.	{WCT}
62426	Grave Creek	661662.7	5524440	2020_planning	082G.124	If this is the mainstem, habitat upstream at bridge appears mod to	

high value.	{WCT}						
62426	Grave Creek	661662.7	5524440	2020_planning	082G.124	Good flow in photos. Smaller channel width. Not on mapped stream location	{WCT}
62426	Grave Creek	661662.7	5524440	2020_planning	082G.124	Smaller channel width. Stream incorrectly mapped.	{WCT}
102994	–	659210.2	5499654	2020_planning	082G.119	Comments indicate partially embedded and backwatered. Other comments indicate good candidate for bridge.	–
197533	Brûlé Creek	651625.5	5528887	2020_field	082G.123	–	{BT,DV,RB,WCT}
197534	Weigert Creek	650147.8	5532049	2020_field	082G.123	–	–
197542	Hartley Creek	643536.7	5490723	2020_field	082G.113	–	{DV,EB,WCT}
197555	–	646737.2	5554528	2020_field	082J.103	–	–
197559	Brûlé Creek	651512.4	5528837	2020_field	082G.123	–	{RB,WCT}
1004600156	–	641368.8	5487802	2020_planning	082G.113	Industrial area with stream splitting 3 ways just upstream.	{EB,LSU,SP,WCT}
1004600264	–	666528.9	5472653	2020_planning	082G.109	WCT upstream with modelled low gradient habitat. Smaller watershed though.	{WCT}
1004600267	–	666187.7	5472563	2020_planning	082G.109	Mottled Sculpin upstream.	{BT,CBA}
1004600621	Quail Creek	645057.0	5492118	2020_planning	082G.113	Private agricultural land. Very low gradient so suspect passable at most flows.	–
1004601149	–	659817.1	5528849	2020_planning	082G.124	WCT upstream.	{WCT}
1004601582	–	641508.0	5477910	2020_planning	082G.113	Stream splits with numerous crossings upstream.	–
1004601687	–	670843.0	5469802	2020_planning	082G.109	Large amount of lower grade habitat modelled upstream. Survey site from Kokannee 2001 (http://a100.gov.bc.ca/pub/acat/public/viewReport.do?reportId=29) upstream 600m.	–
1004602098	–	657221.1	5479085	2020_planning	082G.113	Crossing appears to be likely located 40m to north-east. Interior Reforestation sample site just upstream. No ecocat report link.	–

1004602218	–	654343.0	5497892	2020_planning	082G.118	Large amount of potential habitat but suspect deactivated road. Review before surveying.	{WCT}
1004602564	–	667163.0	5464077	2020_planning	082G.109	Steeper habitat upstream.	–
1004602620	–	680897.0	5453543	2020_planning	082G.109	Kokanee 2001 (http://a100.gov.bc.ca/pub/acat/public/viewReport.do?reportId=29) report resident fish population does not have access to Flathead river at FISS site downstream.	–
1004602726	Flanders Brook	697247.9	5446252	2020_planning	082G.105	Seems like road may be deactivated in aerial imagery. Recommend checking with local foresters.	–
1004602869	Couldrey Creek	667844.0	5434398	2020_planning	082G.104	Suspect deactivation from review of aerial imagey. Large potential habitat gain.	–
1004603040	–	648387.0	5545039	2020_planning	082J.103	Private land.	{EB,WCT}
1004603432	–	639196.0	5591178	2020_planning	082J.113	Relatively steep.	–
1004603477	Burnham Creek	675878.1	5436608	2020_planning	082G.104	Large watershed with WCT know upstream. Good candidate.	{WCT}
1004603597	–	675469.0	5451829	2020_planning	082G.104	Step-pool system. Relatively larger watershed. BT close by.	–
1004603725	Pollock Creek	678149.9	5469459	2020_planning	082G.109	Large stream.	{BT,WCT}
1004603904	–	668900.0	5468357	2020_planning	082G.109	Decent amount of habitat upstream in 5-8% slope class. Road may be overgrown and/or deactivated by appearance of google satelite imagery.	–
1004603908	McLatchie Creek	667049.0	5464485	2020_planning	082G.109	Steeper habitat upstream.	–
1004604006	Gardner Creek	647065.1	5584911	2020_planning	082J.108	Primarily wetland type habitat upstream.	{BSU,BT,DV,LSU,MW,WCT}
1004605451	Nettie Creek	686581.3	5436976	2020_planning	082G.104	Phase 1 required. WCT known upstream. Connected to Proctor Lake which has recorded RB. Large potential habitat gain.	{CC,WCT}
1004605458	–	686473.0	5437250	2020_planning	082G.104	First order watershed.	–
1004606501	–	668124.2	5468514	2020_planning	082G.109	Steeper stream.	–

1004606506	–	670699.0	5469925	2020_planning	082G.109	Extensive low gradient and wetland habitat upstream.	–
1004606545	Cummings Creek	644862.0	5520738	2020_planning	082G.123	Very large watershed with multiple species noted upstream.	–
1004606597	–	683097.0	5444416	2020_planning	082G.104	Stream splits to mult iple channels just upstream with relatively small - low elevation watershed.	–
1004606751	Whiting Creek	652940.4	5515013	2020_planning	082G.118	Railway. Appears potentially backwatered.	–
1004606800	–	644278.7	5471741	2020_planning	082G.108	Large railway crossing structures in aerial photo. Suspect passable.	–
1004606821	Erickson Creek	659887.7	5505156	2020_planning	082G.119	Immediately adjacent to mine	{BT,DV,EB,WCT}
1004607003	–	659238.0	5489723	2020_planning	082G.114	Appears to be PSCIS 50225.	–
1004607273	Packhorse Creek	677870.1	5463568	2020_planning	082G.109	Road looks overgrown in aerial imagery. Suspect ford.	{WCT}
1004607406	–	659304.0	5478557	2020_planning	082G.113	WCT upsstream. Large habitat gain before next potential barrier.	{WCT}
1004607464	–	682774.0	5448438	2020_planning	082G.104	Culvert documented in FISS. Survey sites upstream of crossing.	{WCT}
1004607567	–	655995.0	5472834	2020_planning	082G.108	Fish upstream and down.	{TR}
1100001086	Harmer Creek	657050.7	5522119	2020_planning	082G.123	If this is the mainstem, habitat upstream at bridge appears mod to high value.	{WCT}
1100001086	Harmer Creek	657050.7	5522119	2020_planning	082G.123	Good flow in photos. Smaller channel width. Not on mapped stream location	{WCT}
1100001086	Harmer Creek	657050.7	5522119	2020_planning	082G.123	Smaller channel width. Stream incorrectly mapped.	{WCT}
1100002606	Boivin Creek	647275.1	5541987	2020_planning	082J.103	If this is the mainstem, habitat upstream at bridge appears mod to high value.	–
1100002606	Boivin Creek	647275.1	5541987	2020_planning	082J.103	Good flow in photos. Smaller channel width. Not on mapped stream location	–
1100002606	Boivin Creek	647275.1	5541987	2020_planning	082J.103	Smaller channel width. Stream incorrectly mapped.	–