

BC Geological Survey Assessment Report 1062



COAL ASSESSMENT REPORT TITLE PAGE AND SUMMARY

TITLE OF REPORT: Fording River Operations Assessment Report
2018 Turnbull and Castle Exploration Project

TOTAL COST: \$ 3,040,698.96

AUTHOR: Barry F. Musil
SIGNATURE: Originals Signed and Sealed by Author

NOTICE OF WORK PERMIT NUMBER/DATE: Turnbull Mountain CX-5-012 / May 15 2014 –
May 14 2019
Castle Mountain CX-5-022 / Aug 24, 2018 - Aug. 24, 2023

YEAR OF WORK: 2018

PROPERTY NAME: Turnbull Mountain Exploration (FRO) Castle Mountain Exploration
(FRO)

COAL LICENSE(S) AND/OR LEASES ON WHICH PHYSICAL WORK WAS DONE:
COAL LEASES: 389275, 389290, 389311, 389310, 327991, 389285, 389282, 327992

MINERAL INVENTORY MINFILE NUMBER:
File: 14675-20/1630586

MINING DIVISION: Fort Steele
NTS / BCGS: 082J0262
LATITUDE: 50° 13' 01"
LONGITUDE: -114° 50' 28" (at centre of work)
UTM Zone: 11 **EASTING:** 654000 **NORTHING:** 5565000

OWNER: Teck Coal Limited

MAILING ADDRESS: PO BOX 100, Elkford, BC, V0B 1H0

OPERATOR: Teck Coal Limited

MAILING ADDRESS: PO BOX 100, Elkford, BC, V0B 1H0

REPORT KEYWORDS:

Interbedded sequence of sandstones, siltstones, silty shales, mudstones, and medium to high volatile bituminous coal from the Jurassic–Cretaceous Mist Mountain Formation. The region is structurally complex, containing extensive thrust faulting and folding.

REFERENCES TO PREVIOUS ASSESSMENT WORK AND ASSESSMENT REPORT NUMBERS:
Annual Assessment Reports Since 1970

SUMMARY OF TYPES OF WORK IN THIS REPORT		EXTENT OF WORK (in metric units)	ON WHICH TENURES
GEOLOGICAL (scale, area)			
	Ground, mapping		
	Photo interpretation		
GEOPHYSICAL (line-kilometres)			
	Ground (Specify types)		
	Airborne (Specify types)		
	Borehole		
	Gamma, Neutron	8850.7 m	Coal Lease: 389275, 389290, 389311, 389310
	Density	8850.7 m	Coal Lease: 389275, 389290, 389311, 389310
	Caliper	8850.7 m	Coal Lease: 389275, 389290, 389311, 389310
	Deviation	8850.7 m	Coal Lease: 389275, 389290, 389311, 389310
	Dip		
	Others (specify): Acoustical Televiewer	2753.7 m	Coal Lease: 389310, 289290
	Core		
	Non-core		
SAMPLING AND ANALYSES			
Total # of Samples			
254	Proximate		Coal Lease: 389275, 389290, 389311, 389310
	Ultimate		
240	Petrographic		Coal Lease: 389275, 389290, 389311, 389310
10	Vitrinite reflectance		Coal Lease: 389275, 389290, 389311
2	Carbonization and Coke Testing		Coal Lease: 389290
243	Mineral Ash Analysis		Coal Lease: 389275, 389290, 389311, 389310
254	Single Gravity Wash		Coal Lease: 389275, 389290, 389311, 389310

Tables 7 and 8, and Appendix 5 remain confidential under the terms of the Coal Act Regulation and have been removed from the public version.

http://www.bclaws.ca/civix/document/id/complete/statreg/251_2004

Fording River Operations

Assessment Report

2018 Turnbull and Castle Exploration Project

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2018 Turnbull and Castle Exploration Project

1. INTRODUCTION

This report presents results of coal exploration activities conducted during the summer and fall of 2018 on the Turnbull Mountain and Castle Mountain Exploration projects, located in the Elk Valley Coalfield, Teck Coal Limited, Fording River Operation, in southeastern British Columbia. The exploration work was completed by Fording River site personnel.

i. Property Description and Access

The Turnbull Mountain and Castle Mountain Exploration projects are located in the Fording River property and Upper Fording River Valley, approximately 26 kilometers north, and east of Elkford, BC. Access to the Fording River property is by paved road northeast from Elkford along the Fording River Valley, or north along the Elk River Valley via the Forestry Service gravel road or the Kan-Elk Powerline road. Refer to Figure 1 for property location.

ii. Property History

The Elk River portion of the property was actively explored by the Canadian Pacific Railway Company in the period between 1902 and 1908. Until 1947, the property was comprised of 10,276 hectares in 40 Crown Granted Lots. In that year, the holdings were reduced to 2,979 hectares in 15 Crown Granted Lots. In 1967 and 1968, Canadian Pacific Oil and Gas reacquired part of the coal lands which had been abandoned in 1947. An additional nine Coal Licenses located at the south end of the property were acquired in 2001. At the present time, the Fording River Property consists of 22,128 hectares, held on seven coal leases and 21 coal licenses. The tenure number, name, owner, grant, and area are summarized in Table 1. All licenses are located in British Columbia in the Fort Steel Mining Division. Refer to Figure 2 for coal lease and license location.

Mining operations, which commenced in 1971, have produced more than 280 million tonnes of clean metallurgical and thermal coal for markets in North and South America, Africa, Europe, and Asia.

Table 1
FRO Coal Licenses

Code	Name	Parties	Status	Grant Date	Area (Ha)	Project
389275	COAL LEASE No. 01	TECK COAL LIMITED (100%)	Active	1/1/1974	1,009.00	Fording River Operations, BC
389282	COAL LEASE No. 02	TECK COAL LIMITED (100%)	Active	5/19/1977	2,250.00	Fording River Operations, BC
389285	COAL LEASE No. 05	TECK COAL LIMITED (100%)	Active	3/17/1982	644	Fording River Operations, BC
389290	COAL LEASE No. 09	TECK COAL LIMITED (100%)	Active	10/1/1991	1,096.00	Fording River Operations, BC
389310	COAL LEASE No. 16	TECK COAL LIMITED (100%)	Active	5/9/1998	2,859.00	Fording River Operations, BC
389311	COAL LEASE No. 17	TECK COAL LIMITED (100%)	Active	5/9/1999	8,180.00	Fording River Operations, BC
389312	COAL LEASE No. 18	TECK COAL LIMITED (100%)	Active	1/30/2000	1,298.00	Fording River Operations, BC
402047	CLIC-402047	TECK COAL LIMITED (100%)	Active	5/8/2003	259	Fording River Operations, BC
402048	CLIC-402048	TECK COAL LIMITED (100%)	Active	5/8/2003	129	Fording River Operations, BC
402049	CLIC-402049	TECK COAL LIMITED (100%)	Active	5/8/2003	258	Fording River Operations, BC
402050	CLIC-402050	TECK COAL LIMITED (100%)	Active	5/8/2003	259	Fording River Operations, BC
402051	CLIC-402051	TECK COAL LIMITED (100%)	Active	5/8/2003	261	Fording River Operations, BC
402052	CLIC-402052	TECK COAL LIMITED (100%)	Active	5/8/2003	258	Fording River Operations, BC
402053	CLIC-402053	TECK COAL LIMITED (100%)	Active	5/8/2003	129	Fording River Operations, BC
402054	CLIC-402054	TECK COAL LIMITED (100%)	Active	5/8/2003	129	Fording River Operations, BC
402055	CLIC-402055	TECK COAL LIMITED (100%)	Active	5/8/2003	259	Fording River Operations, BC
402056	CLIC-402056	TECK COAL LIMITED (100%)	Active	5/8/2003	259	Fording River Operations, BC
402057	CLIC-402057	TECK COAL LIMITED (100%)	Active	5/8/2003	130	Fording River Operations, BC
402058	CLIC-402058	TECK COAL LIMITED (100%)	Active	5/8/2003	240	Fording River Operations, BC
402105	CLIC-402105	TECK COAL LIMITED (100%)	Active	5/8/2003	259	Fording River Operations, BC
402106	CLIC-402106	TECK COAL LIMITED (100%)	Active	5/8/2003	325	Fording River Operations, BC
402110	CLIC-402110	TECK COAL LIMITED (100%)	Active	5/8/2003	258	Fording River Operations, BC
402111	CLIC-402111	TECK COAL LIMITED (100%)	Active	5/8/2003	255	Fording River Operations, BC
402112	CLIC-402112	TECK COAL LIMITED (100%)	Active	5/8/2003	228	Fording River Operations, BC
402113	CLIC-402113	TECK COAL LIMITED (100%)	Active	5/8/2003	95	Fording River Operations, BC
402115	CLIC-402115	TECK COAL LIMITED (100%)	Active	5/8/2003	284	Fording River Operations, BC
417067	CLIC-417067	TECK COAL LIMITED (100%)	Active	10/14/2005	259	Fording River Operations, BC
417068	CLIC-417068	TECK COAL LIMITED (100%)	Active	10/14/2005	259	Fording River Operations, BC

2. GEOLOGY

i. Stratigraphy

The general stratigraphic succession on the Fording River Property is summarized in Table 2:

Table 2
Fording River Stratigraphy

Period	Litho-Stratigraphic Units			Principle Rock Types
Recent				Colluvium
Quaternary				Clay, silt, sand, gravel, cobbles
Lower Cretaceous	Blairmore Group			Massive bedded sandstones and conglomerates
Lower Cretaceous to Upper Jurassic	KOOTENAY GROUP	Elk Formation		Sandstone, siltstone, shale, mudstones, chert pebble conglomerate, minor coal
		Mist Mountain Formation		Sandstone, siltstone, shale, mudstones, thick coal seams
		MORRISSEY FORMATION	Moose Mountain Member	Medium to coarse-grained quartz- chert sandstone
			Weary Ridge Member	Fine to coarse-grained, slight ferruginous quartz-chert sandstone
Jurassic	Fernie Formation			Shale, siltstone, fine-grained sandstone
Triassic	Spray River Formation			Sandy shale, shale quartzite
	Rocky Mountain Formation			Quartzite
Mississippian	Rundle Group			Limestone

The oldest rocks present on the Fording River property are the Rundle Group limestone, located on the west bank of the Fording River, near the southern property boundary.

These rocks are in faulted contact with the Kootenay Group to the west, and unconformable contact with Rocky Mountain Formation quartzites to the north. The latter are best exposed on the eastern slope of the Brownie Creek valley.

The Fernie Formation shales occur throughout the area, generally along the sides of the valleys on the lower flanks of the mountains. The shales are recessive and, generally poorly exposed. However there are some good exposures of Fernie Formation strata on the lower western slopes of Eagle Mountain in

some creek drainages. The Fernie Formation is in conformable contact with the Morrissey through the "Passage Beds," which are a transitional zone from marine to non-marine sedimentation.

The Morrissey Formation, which is the "basal sandstone" of the Kootenay Group, is a prominent cliff-forming marker horizon in many locations. On the Fording River property, the top of the Moose Mountain member (Morrissey Formation) is in sharp contact with 010 seam, the lowermost bed of the Mist Mountain Formation.

The Mist Mountain Formation contains all of the economic coal seams, and is the most widely occurring formation on the Fording River property. This economically important formation is an interbedded sequence of sandstones, siltstones, silty shales, mudstones, and medium to high volatile bituminous coal seams. The volatile content of the coal increases up section, with decreasing rank. Lenticular sandstones comprise about 1/3 of the Mist Mountain sediments at Fording River, but very few laterally extensive sandstone beds exist.

The sandstone immediately above and below seam 040 and above 090, are the most persistent units, and are often cliff-forming marker horizons.

The Mist Mountain Formation is generally overlain conformably by strata of the Elk Formation. On the Fording property, this formation is commonly a succession of sandstones, siltstones, shales, mudstones, chert pebble conglomerates, and sporadic, thin, high volatile bituminous coal seams. The coal seams are characterized by high alginate content and referred to as "Needle" coal. The Elk Formation is observed near the tops of the mountains, mainly on the east side of the Elk Valley on the Greenhills Range, and northward to the Mount Tuxford areas.

The top of the Elk Formation marks the upper boundary of the Kootenay Group, which is unconformably overlain by the basal member of the Blairmore Group. This thick bedded, cliff-forming sandstone and conglomerate unit is observed on the upper slopes of Mount Tuxford.

ii. Structure

Subsequent to deposition, the sediments were involved in the mountain building movements of the late Cretaceous to early Tertiary Laramide orogeny. The major structural features of the Fording River property are the North-South trending synclines with near horizontal to steep westerly dipping thrust faults, and a few high angle normal faults. Some of the thrust faults were probably folded late in the tectonic cycle.

The formation of the major fold structures began early in the tectonic cycle. In the current mining area, two asymmetric synclines are evident: the Greenhills Syncline to the west, and the Alexander Creek Syncline to the east of the Fording River.

The thrust faulting (i.e.: the Ewin Pass and Brownie Ridge Thrusts), was probably contemporaneous with the later stages of folding. The intervening anticline was subsequently faulted (Erickson Fault), then eroded.

The Alexander Creek Syncline can be traced from the southern property boundary on Castle Mountain to the northern end of the property on Weary Ridge. The strata of the west limb, on the west face of Eagle Mountain, dip easterly at 20 to 25°, decreasing gradually to zero as the axis is approached. The east limb, however, attains a 20° westerly dip within a much shorter (500m) distance of the axis.

This asymmetry is possibly due, at least in part, to the influence of the Ewin Pass Thrust which subcrops 600 to 800 meters east of the synclinal axis.

Further to the east, on Brownie Ridge, the strata dip westerly at a mean dip of 42°. The Brownie Ridge Thrust, which subcrops near the crest of the ridge, probably contributes to this steepening.

Within the mining area, the axis of the Alexander Creek Syncline plunges to the north at an average of 4°. Turnbull Mountain exhibits a localized series of en echelon fold structure, plunging both to the north and to the south. These subsidiary folds may be related to thrust faulting. From the south end of Mount Tuxford, the synclinal axis continues north- northwest along the base of Mount Veits and into the Elk River Valley near Aldridge Creek.

On Mount Tuxford, the beds exposed are those of the Elk Formation and the overlying (non-coal bearing) Cadomin Formation. The area has not been extensively explored. The stratigraphic sequence of the east limb, in the more extensively explored Mist Mountain strata near Aldridge Creek (Elco property), closely resembles the east limb strata found on Henretta Ridge, ten kilometers to the south.

On the northwest corner of Eagle Mountain, the lower Kootenay-upper Fernie section is the locus for a zone of near horizontal thrust faulting. The effect is to cause a double repetition of the lower coal seams and basal sandstone on the west synclinal limb. This fault zone is synclinal in form and continuous with the Ewin Pass Thrust zone found in the east limb.

The Greenhills Syncline in the mining area is essentially a “mirror-image” of the Alexander Creek structure. The east limb of the asymmetric syncline dips westerly at 15 to 25°, except in areas near the Erickson Fault, where 45 to 55° dips are common. The west limb exhibits much steeper dips, commonly in the 35 to 45° range. The Greenhills Syncline plunges northward (340 to 350°), at less than 5°, and then appears to die out to the north in the area of the Osborne Creek Depression.

The Erickson Fault, which locally runs along the base of the Greenhills Range, west of the Fording River, is one of the major regional faults. From south to north, this westerly dipping (40 to 70°) normal fault, brings Mist Mountain strata progressively into contact with Rundle, Rocky Mountain, Spray River, Fernie, and Morrissey strata. The downthrown block is to the west. Near the south end of Lake Mountain, the Erickson Fault begins to “splay” into two zones.

The main fault runs along the eastern margin of Lake Mountain, and the subsidiary fault runs to the west and appears to “die out” northward. The steep northward dip exhibited in the Lake Mountain strata could be due to influence from these flanking “splays” of the fault. The flat lying region to the north of Lake Mountain (Osborne Creek Depression area) is completely void of outcrop, and the Erickson Fault has not been traced either through or to the north of this area.

Refer to Figure 3-1 and Figure 3-2 for detailed geological maps of Turnbull and Castle Mountain exploration areas. Refer to corresponding cross sections: Figures 6-1, 6-2, 6-3, and 6-4.

3. 2018 SUMMARY OF EXPLORATION WORK

i. 2018 Exploration Project Objectives

In 2018 Fording River conducted an exploration drilling and coal sampling program on Turnbull and Castle Mountain. Some geotechnical drilling and test pitting was completed as well.

On Turnbull Mountain, 10 Reverse Circulation (RC) drill holes were drilled for structure and coal quality purposes. Two bulk samples were completed with a 0.23m Large Diameter Coring (LDC) rig at one drillsite. One diamond drill hole with HQ drillrod was also drilled for the geotechnical purposes and was not sampled for coal quality. In total 11 drillholes and two bulk samples were completed. There was 4,007m RC, 750m LDC, and 249.7m of diamond drilling. In total there was 5,006.7m drilled. Geophysical logs were completed for the 10 exploration and one geotechnical hole.

On Castle Mountain, seven (RC) drillholes and three HQ geotechnical drillholes were drilled. The (RC) drillholes were drilled for structure and coal quality purposes. The diamond drillholes were drilled for structure to aid in pit design and were not sampled for coal quality purposes. In total 10 drillholes were completed, 3968.5m RC and 953.3m HQ. In total there was 4921.8 m drilled. Geophysical logs were completed for the seven exploration and two geotechnical holes. GTF18-17 was abandoned due to weather conditions and will be completed in 2019. 15 test pits were completed for geotechnical purposes.

The overall objective for the 2018 Turnbull and Castle Mountain Exploration drilling program was to improve resource confidence and increase coal location and quality knowledge using tighter spaced drilling, sampling and additional coal quality analyses.

These objectives were accomplished by:

- Developing and implementing an exploration program that included drilling and logging of 17 new RC coal exploration holes, collecting two bulk samples, and drilling four geotechnical holes.
- Revising geological interpretation that was based on historic mapping and drilling in the Turnbull and Castle Mountain area(s);
- Integrating the new exploration and geotechnical drilling results with previous historic programs;
- Updating the geological interpretation based on new drilling;
- Determine the coal quality of the represented coal seams from drill cuttings samples and bulk samples;
- Updating the coal resources in the exploration area using a computer geologic model; and
- Improve resource model and support an economic assessment of Turnbull and Castle Mountain.

Each drilling location was surveyed to obtain exact coordinates and elevations. Presently, on Castle Mountain there is one remaining RC drillhole and three HQ geotechnical holes to pickup. The exploration project was completed under the direction and supervision of Fording River Operation's site geology team.

Table 3 shows the drillhole locations with respect to Coal License.

Table 3
Drillhole Locations Relative to Coal License

Coal License	Drillholes and LDC sites
389290	3451,3452,3453,3456,3457,GTF18-11,BK-0033
389275	3450,3459
389311	3454,3455,3458
389310	GTF18-15, GTF18-19, 3415,3416,3418,3420,3421,3444,3445

ii Summary of Completed Work

The total cost for the 2018 Turnbull and Castle Mountain Exploration Project was \$ 3,040,698.96. \$1,023,465.69 was spent on Turnbull and \$2,016,233.27 was spent on Castle. See Appendix 1 for the cost statement.

The exploration project planning, execution, and geological interpretation and modeling were completed by the Fording River geology team.

Prior to drill site preparation on Turnbull and Castle Mountain, the excavated trails and exploration drill sites were located by the Fording River geology team. Trail and drill site construction for Turnbull Mountain began in June. The new roads and drill pads were completed by Transcendent Mining and Mobilization of, Elkford, BC. Engineered road and pad design on slopes steeper than 40 degrees was completed by Vast Resources of, Cranbrook, BC. Danger tree falling was completed by Nupqu Development Corporation of, Cranbrook, BC. Existing Road was opened up and 1.39 km of new excavated trail was completed. 11 drillpads and one LDC site was completed. Six drillpads and one LDC site was built on existing roads. Five drillpads were built off the newly excavated trail.

On Castle Mountain, the opening up of existing roads and drill site construction began in September. The work was completed by McKay Contracting of, Cranbrook, BC. Engineered road and pad design on slopes steeper than 40 degrees was completed by Vast Resources of, Cranbrook, BC. Danger tree falling was completed by Nupqu Development Corporation of, Cranbrook, BC. No new trail was excavated. All drillpads were built on existing roads.

RC and LDC drilling services were performed by Foraco Canada Ltd., Calgary, AB using a Foremost DR-24. The reverse circulation drilling method was chosen as the preferred method for collecting uncontaminated, representative and accurately located coal samples. LDC is the preferred method for collecting bulk samples for the purpose of carbonization.

As sampling accuracy is critical to develop an accurate understanding of coal seam thickness and quality, Fording River utilized a rigorous Quality Assurance/Quality Control procedure to assure accurate collection of coal samples.

A total of 17 RC drillholes were completed by Foraco for a cumulative drilling length of 7970.5m. Drillhole depths ranged between 238 and 733 m, averaging 465 m. Three HQ geotechnical holes were drilled for a total of m by Foraco Drilling of, Kamloops, BC. One HQ geotechnical hole was drilled 249.74m by Geotech Drilling of, Vernon, BC. Core was logged for geology and rock mass rating (RMR), refer appendix 2. Acoustical televiewers were run down each geotechnical hole and RC drillhole 3421 and 3416. Geotechnical analysis and core logging was completed by TetraTech consultants of, Burnaby, BC on Turnbull Mountain. Stantec consultants of, Calgary, AB performed this work on Castle Mountain. Drillhole information is given in Table 4, and the exploration area with drillhole locations are shown in Figure 5-1 for Turnbull Mountain and Figure 5-2 for Castle Mountain.

Table 4
2018 Drill Hole Collar Locations

Drillhole Name	Project	Purpose	UTM COORDINATES		Elevation	Azimuth	Dip	Hole Depth (m)
			Easting	Northing				
3415	Castle	geological	656077.986	5556196.262	2057.282	0	-90	573
3416	Castle	geological	656300.007	5556250.132	2094.393	0	-90	610
3418	Castle	geological	655896.980	5556615.347	1981.121	0	-90	512
3420	Castle	geological	655863.258	5557494.578	2209.511	0	-90	531
3421	Castle	geological	656133.092	5557624.027	2218.814	0	-90	733
3444	Castle	geological	655457.599	5556828.381	1935.139	0	-90	420.5
3445	Castle-not surveyed	geological	656056.980	5556466.210	2031.190	0	-90	584
GTF18-19	Castle-not surveyed	geotechnical	655883.800	5560018.600	1873.000	60	-85	270.8
GTF18-15	Castle-not surveyed	geotechnical	656065.100	5559404.800	2117.500	50	-80	500.2
3450	Turnbull	geology	652447.810	5564973.999	2049.273	0	-90	317
3451	Turnbull	geology	654402.353	5565577.096	2200.003	0	-90	293
3452	Turnbull	geology	654020.116	5565921.626	2024.904	0	-90	297
3453	Turnbull	geology	654509.274	5565380.550	2294.224	0	-90	366
3454	Turnbull	geology	654208.770	5564127.647	2056.555	0	-90	312
3455	Turnbull	geology	654187.750	5564639.760	2319.670	0	-90	585
3456	Turnbull	geology	654667.383	5565302.970	2209.725	0	-90	421
3457	Turnbull	geology	653881.132	5565437.113	2203.282	0	-90	593
3458	Turnbull	geology	654623.474	5564925.899	2218.644	0	-90	421
3459	Turnbull	geology	652493.733	5564776.829	2086.807	0	-90	402
GTF18-11	Turnbull	geotechnical	652560.269	5565394.219	1984.639	122	-77	249.74

Downhole geophysical logs were completed by Century Wireline Services, Red Deer, AB. Each hole was logged through the drill pipe for gamma-neutron. Open holes were logged for downhole deviation, caliper, resistivity, and gamma density. Refer to geophysical logs in Appendix 3. Acoustical televiewers were run on two exploration RC, and three geotechnical holes for geotechnical analysis (Appendix 3).

Coal seams intersected by reverse circulation drilling were sampled in 0.5 meter intervals. Representative composite samples for each coal seam were prepared at Fording River Operation's on-site process plant laboratory. Raw composite samples received in-house raw proximate, sulphur, and FSI analysis.

Composites were forwarded to GWIL Industries, Calgary, AB, for single gravity wash, mineral ash analysis (MAA), and fluorine analysis. Clean coal samples were returned to the Fording River laboratory where Fording River Operation's staff completed in-house clean proximate analysis: ash, volatile matter, raw moisture, fixed carbon, sulfur, P_2O_5 , and FSI. Pearson Coal Petrography, Victoria BC, completed Petrographic analysis.

LDC is a specialized method of drilling using a conventional reverse circulation rig to drill a 0.23m diameter hole to recover representative core of coal seams. The seams targeted at site BK-0033 were 140220 and 130220. A total of 11 coring holes were drilled three meters apart on the same drill pad to extract sufficient coal from each seam for for a pilot plant wash and carbonization testing. 813 kgs was collected for seam 140220 and 1107.5 kgs was collected for seam 130220. RC hole 3391, drilled in 2015, was used as a pilot hole to determine suitability of the site and coal seams for bulk sampling. Refer to table 5 for bulk sample coordinates.

Bulk samples from seams 140220, 130220 were sent to GWIL Industries Inc. (Calgary, AB) for homogenization and washability analysis, then to Hazen Research Inc (Golden, CO) for a pilot-plant wash, and then to Canmet Energy (Ottawa, ON) for carbonization and testing.

Table 5
Bulk sampling

Drillhole Name	Project	Purpose	UTM COORDINATES		Elevation	Azimuth	Dip	# of Holes	Hole Depth (m)
			Easting	Northing					
BK-0033	Turnbull	LDC Bulk Sample	653717.865	5565748.437	2103.546	0	-90	11	3 holes at 130m 8 holes at 45m

15 test pits were completed on Castle Mountain by McKay Contracting of, Cranbrook, BC. Logging of the pits was completed by Teck Coal staff. Pits had a surface area of 1x2m and ranged in depth from 2-10m. They were taken on the edge of existing roads and filled back in. Pits were logged and sampled for geotechnical water management and spoil suitability. Locations are shown in Table 6. Refer to appendix 4 for soil logs.

Table 6
2018 Test Pit Locations

Test Pit ID	UTM COORDINATES		Elevation
	Easting	Northing	
TP18-04	653610	5558651	1879.881
TP18-05	653728	5558738	1944.158
TP18-06	653342	5558959	1742.388
TP18-07	653402	5559328	1788.83
TP18-08	653498	5559467	1812.15
TP18-09	654268	5560046	1831.497
TP18-10	653822	5559892	1805.653
TP18-11	653879	5559399	1990.849
TP18-14	655032	5560058	1830.107
TP18-15	655704	5560177	1875.865
TP18-19	655869	5559561	2034.934
TP18-20	655169	5555519	1711.922
TP18-21	655454	5556665	1928.81
TP18-22	655164	5557575	1932.137
TP18-23	656024	5558246	2276.464

Geochemical samples were taken on exploration drillholes, 3457 and 3455 in Turnbull and 3444 and 3416 in Castle. Samples were conducted the entirety of the drillhole in the Elk, Mist Mountain, and Morrissey Formations. RC drill cutting samples were 1 to 2 kg(s) in size and were sampled off a shaker table. In the Elk Formation samples were collected in two meter intervals. In the Mist Mountain Formation samples targeted three intervals: Two meter intervals for typical rock, 0.5 meter intervals above and below coal seams, and entire coal seams. In the Morrissey Formation samples were collected in one meter intervals. Samples were tested for the geochemical signatures of the rock, specifically looking for the potential of Acid Generation (PAG). Samples were shipped to Maxxam Analytics of Burnaby, BC for analysis. Results from Maxxam can be found in Appendix 5.

4. RESULTS

i) Turnbull Mountain

The primary goal of the 2018 drilling program on Turnbull Mountain was to improve resource confidence through tighter spaced drilling, and to increase coal seam location and quality knowledge. Holes were drilled to infill to an approximate 400 meter density between prior Turnbull exploration holes with favorable results. The project consisted of 10 exploration RC drillholes, two bulk samples using the LDC drilling method, and one HQ diamond drillhole for geotechnical purposes. There was 4007 m RC, 750 m LDC, and 249.7 m diamond drilling. In total there was 5006.7m drilled. Geophysical logs were completed for the 10 exploration and one geotechnical hole.

The Mist Mountain Formation in the Turnbull mountain area is structurally dominated by the Ewin Pass (TB_Major thrust 210-220) and Brownie Ridge (220-230 Fault) thrust faults, with displacement of over 250

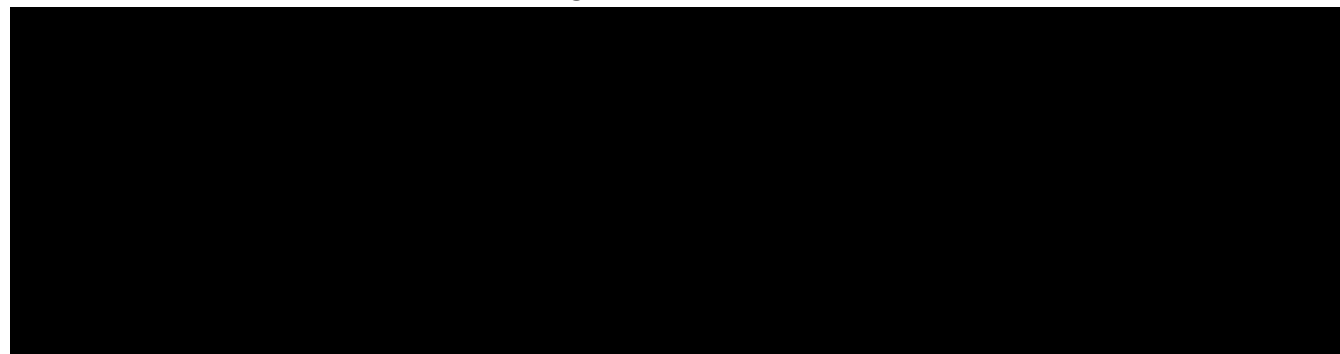
and 100 meters respectively. The three major fault blocks in Turnbull mountain are known as the 210 (west of Ewin Pass fault), the 220 (east of Ewin Pass and west of Brownie Ridge fault), and the 230 (east of Brownie Ridge fault) The Turnbull mountain area contains five dominant coal seams (40, 50, 70, 110 and 130 packages) which are consistently greater than four meters in thickness, and often significantly thicker. The 2018 Turnbull Mountain exploration drilling showed continuation of significant seams in both the 210 and 220 fault blocks.

In house raw coal assay results from composites have been completed and are included in Appendix 5. In house clean coal assay results from the composite samples are in the process of being completed. All completed clean coal assay results are in Appendix 5. To-date petrography and Mineral Ash Analysis (MAA) has not been completed. As results are completed, they will be added to the seam's qualities in the geological data base and interpolated in the geological model. Carbonization and coke testing from Turnbull Mountain seams 140220 and 130220 have yet to be completed. Previous seam qualities support the coal's marketability and assist the long term mine plan for the region.

The 2018 drilling program results have yet to be incorporated into the Fording River East 3D Block Model. The geological model will be used for detailed mine planning and economic analysis. For modeling methods and parameters please refer to Appendix 6.

There are no reserves published for Turnbull Mountain as detailed engineering work has not been completed. Turnbull Mountain resources are incorporated with Eagle and Henretta resources, and are collectively called FRO East. Resources for FRO East are explained in Table 7.

Table 7
2018 Fording River East Resources



i) Castle Mountain

The primary goal of the 2018 drilling program on Castle Mountain was to improve resource confidence through tighter spaced drilling, and increase coal seam location and quality knowledge. Drilling had not been completed since 2009. The project consisted of seven exploration RC drillholes and three HQ diamond drillholes for geotechnical purposes. There was 3963.5m RC and 953.3m diamond drilling. In total there was 4921.8m drilled. Geophysical logs were completed for the seven exploration and two geotechnical holes. Geotechnical hole GTF18-17 was abandoned and will be completed in 2019.

The Castle Mountain project area is structurally dominated by the Alexander Creek syncline; primarily the west limb. Several minor thrust faults affect the area resulting in localized repetitions of many of the coal

seams. The regional Ewin Pass thrust fault (210-220) forms the eastern boundary of the project area.

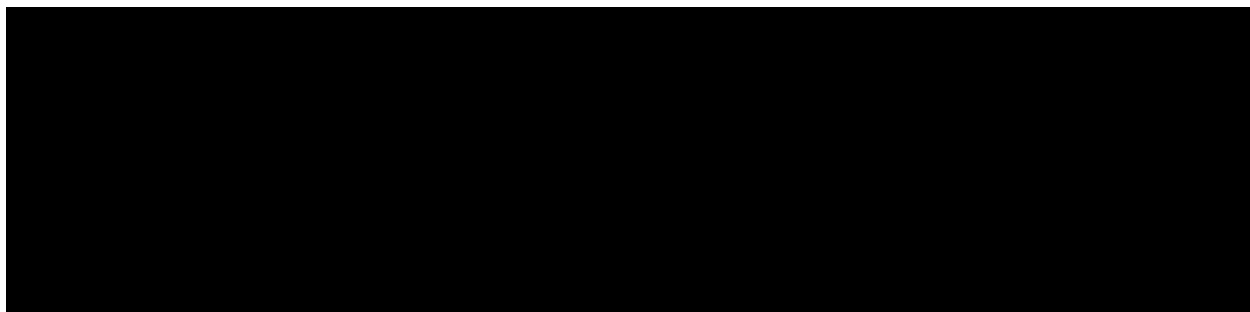
All RC exploration drill holes and geotech holes were drilled in the southern area of the resource. These drillholes drilled through the 210 (G-block) and showed continuation of identified major seam packages: 130, 120, 110, 090, and 070. RC exploration hole 3421 drilled through the Ewin Pass thrust fault (210-220) and into the 220 (N-block). It showed continuation of identified major seam packages: 120, 110, and 090. GTF18-15 and GTF18-19 were drilled in the northern area of the resource and drilled through the N-block. It showed continuation of identified major seam package: 040.

In house raw coal assay results from composites have been completed and are included in Appendix 5. In house clean coal assay results from the composite samples have yet to be completed. Once done, they will be added to the seam's qualities in the geological data base and interpolated in the geological model. Also, to-date, coal petrography reports and MAA have not been processed. Previous seam qualities support the coal's marketability and assist the long term mine plan for the region.

Castle Mountain Resources have not been incorporated into the Fording River East 3D Block Model. Resources have been calculated using the Castle Mountain 3D Block Model.

Table 8 shows Castle Mountain Resources and does not include updated 2018 drilling.

Table 8
2018 Castle Mountain Resources



5. CONCLUSION

The 2018 exploration drilling program has successfully increased drillhole density and resource confidence in Turnbull and Castle Mountain. The program confirmed the location and continuity of all coal seams in the Turnbull and Castle Mountain area(s) allowing for improved geological and structural interpretation. The assay results are ongoing and coal quality data will be incorporated into the geological model. Fording River Operations is in the process of updating its current model. A mine engineering economic assessment of Turnbull and Castle Mountain is under evaluation.

Further RC drilling to improve resource confidence and to increase the amount of coal quality data including ash, volatile matter, P_2O_5 , FSI, fluorine, and fluidity is recommended prior to detailed planning for mining. In addition, bulk sampling of all economic seams using the LDC drilling method is recommended for carbonization and coke testing.

6. AUTHOR'S QUALIFICATIONS

Statements of Author's Academic and Professional Qualifications

CERTIFICATE OF QUALIFIED PERSON

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Company: Teck Coal Limited

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Elkford, BC

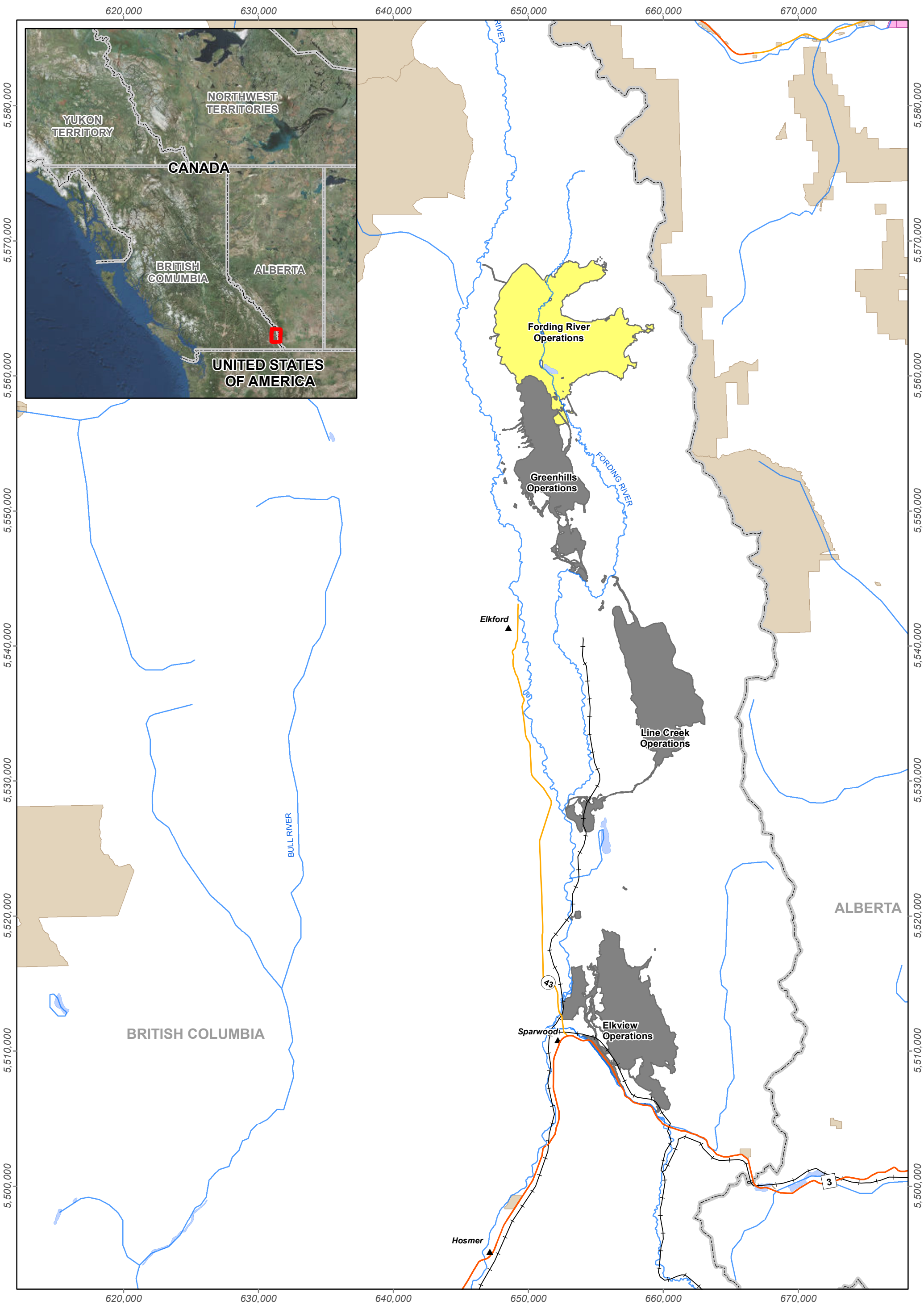
VOB IHO

Phone: (250) 865-5169

I, Barry F. Musil, P.Geo, am employed as a Senior Geologist, Supervisor at Fording River Operations. This certificate applies to the report titled "Fording River Operations, Assessment Report, 2018 Turnbull and Castle Exploration Program". I graduated from the University of British Columbia with a Bachelor of Science Degree in Geology, 1984. I am a member of the Association of Professional Engineers and Geoscientists of British Columbia (# 19361). Since 1986 I have been involved with coal mining projects at Fording River, and other Teck Coal Operations. As a result of my experience and qualifications, I am a Qualified Person as defined in National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101).

"Signed and Stamped"

Barry F. Musil, P.Geo.



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Figure 1 - Location Map

▲ Communities

—+— Canadian Pacific Railway

— Primary Highway

— Secondary Highway

— Watercourse

--- British Columbia - Alberta Border

■ Mine Permit Boundaries

■ FRO Mine Permit Boundary

■ First Nations Reserve

■ Provincial Park/Protected Area

■ Waterbody

N

02.55 Kilometers

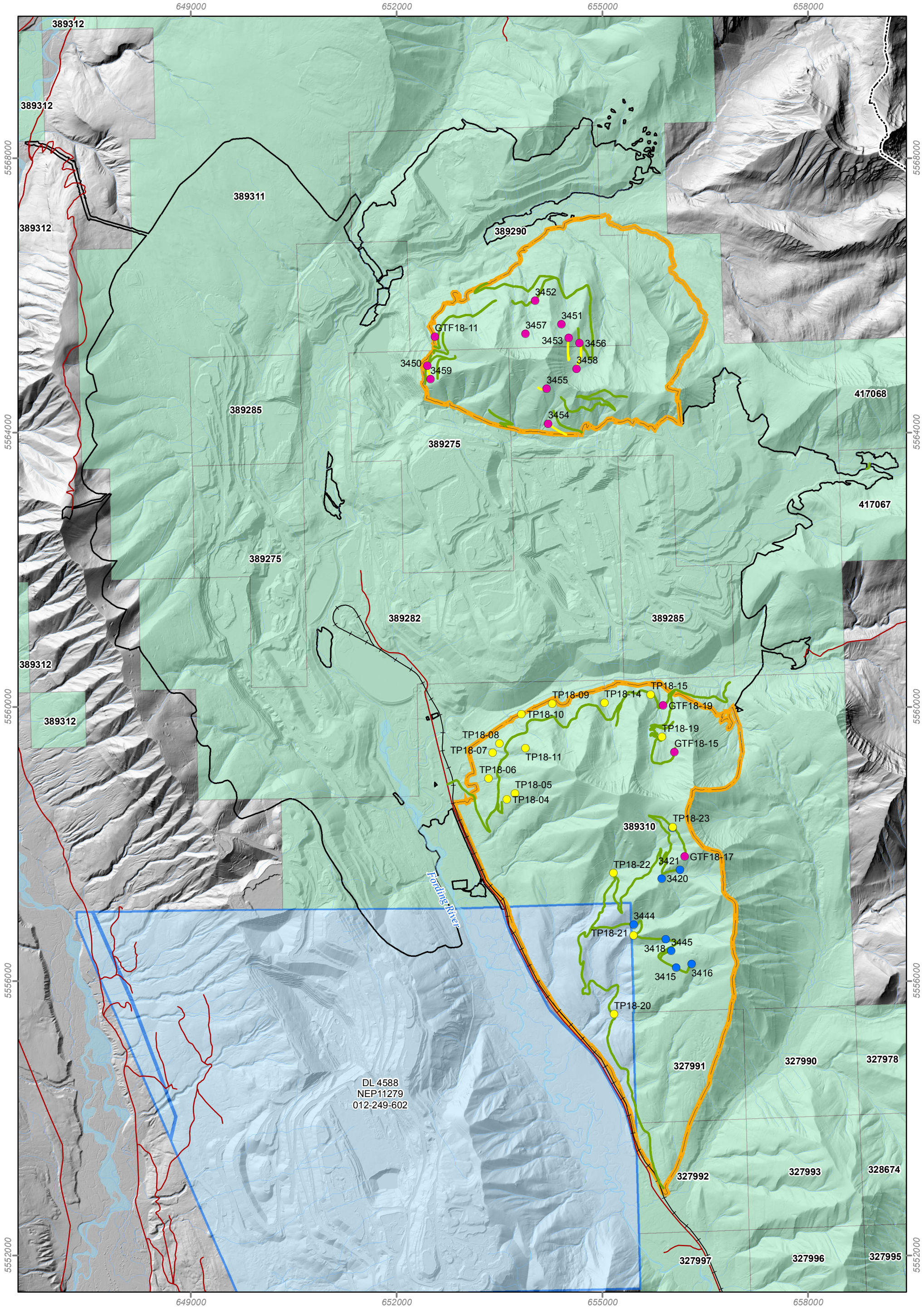
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4/13/2016

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Elk Valley

COORDINATE SYSTEM:
NAD 1983 UTM Zone 11N

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2018 Exploration Activities

- Geotech Collar
- Geotech Test Pit
- RC Collar

- 2018 Excavated Road
- 2018 Re-Activated Road
- MYAB Boundary
- Roads
- Railway

- Mineral Coal Tenure
- Teck Fee Simple
- Provincial Boundary
- Watercourse

N

00.51

Kilometers

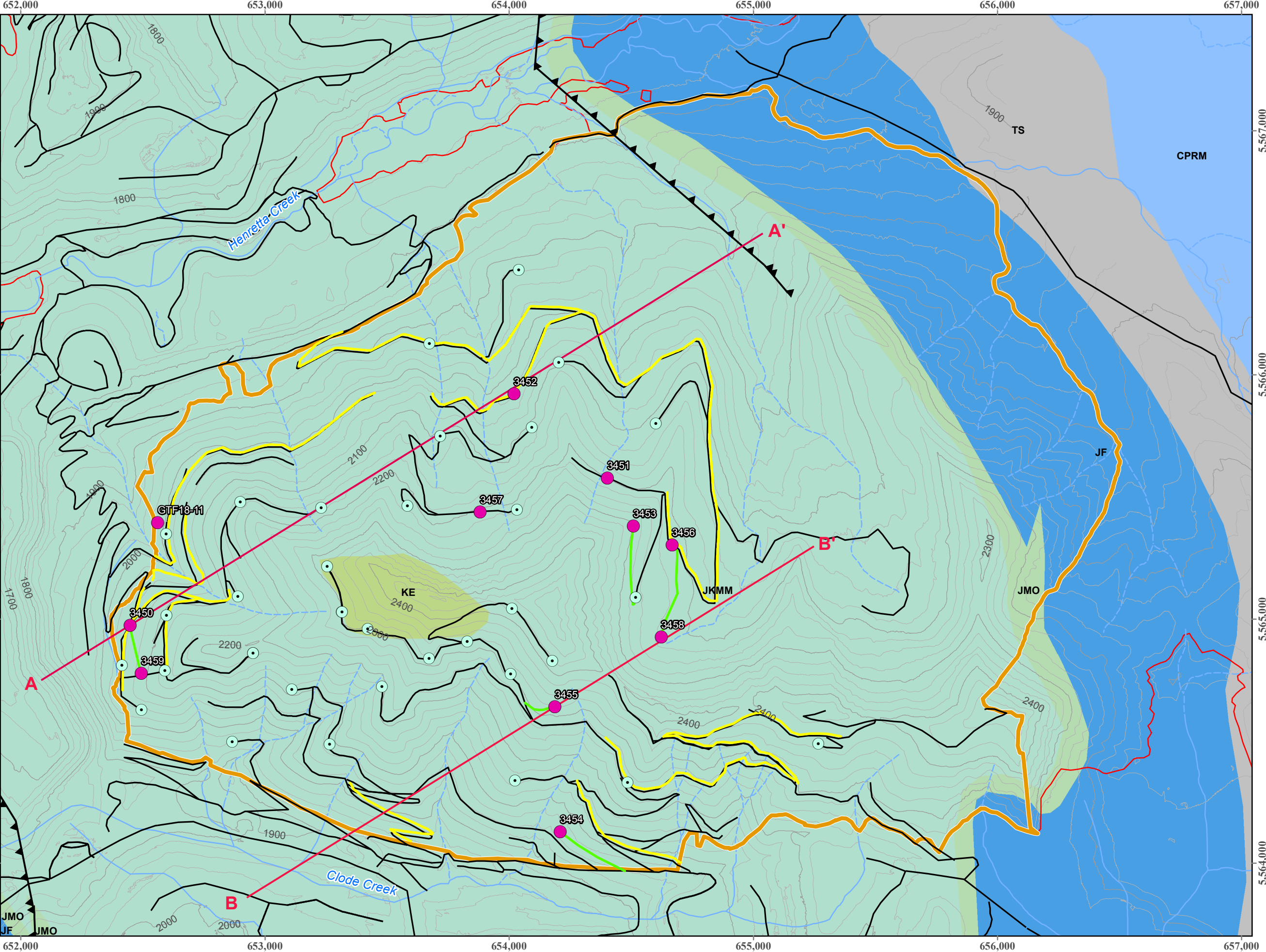
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MINE OPERATION:
Fording River

SCALE:
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COORDINATE SYSTEM:
NAD 1983 UTM Zone 11N

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Teck

Turnbull

Geological Map

2018 Drillhole

2014 to 2017 Drillholes

Cross Section Trace

2018 Excavated Roads: 1.39 km

2018 Re-Activated Roads: 11.96 km

Pre-Existing Roads: 34.35 km

Faults

MYAB Boundary

LOWER CRETACEOUS

KC

CROWSNEST FORMATION

KBI

BLAIRMORE GROUP

KE

KOOTENAY GROUP
ELK FORMATION

UPPER JURASSIC AND LOWER CRETACEOUS

JKMM

MIST MOUNTAIN FORMATION

JMo

MORRISEY FORMATION

JF

FERNIE FORMATION

TRIASSIC

TWh

SPRAY RIVER GROUP
WHITEHORSE FORMATION

TSM

SULPHUR MOUNTAIN FORMATION

UPPER CARBONIFEROUS AND PERMIAN

CPRM

ROCKY MOUNTAIN SUPERGROUP

LOWER CARBONIFEROUS

TS

SPRAY RIVER GROUP

N

03,6007,20014,40021,600

Meters

DATE:
3/4/2019

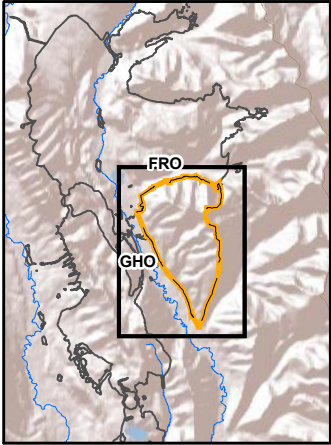
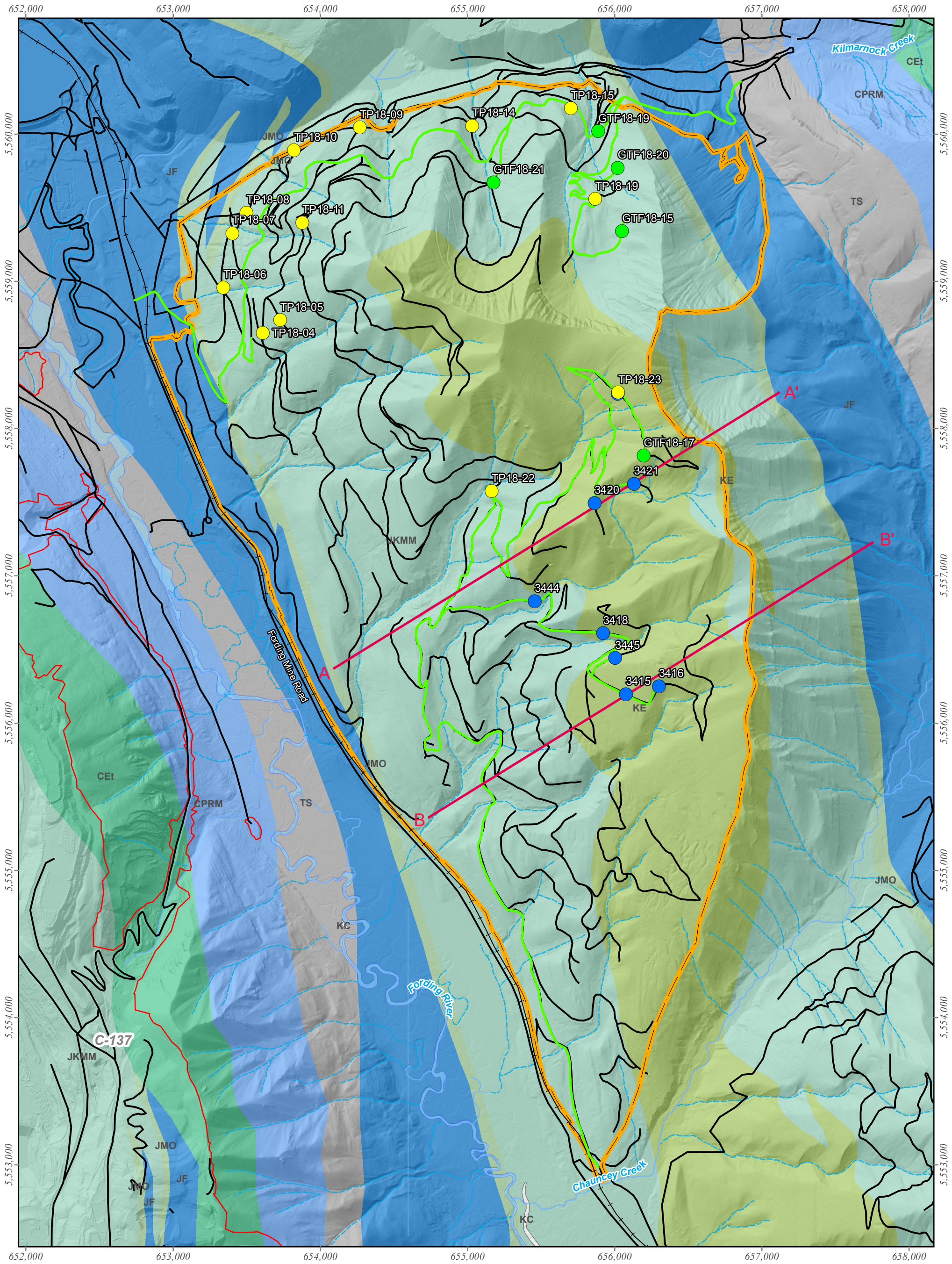
MINE OPERATION:
Fording River

SCALE:
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COORDINATE SYSTEM:
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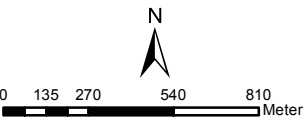


Castle 2018 Exploration Summary - Geological Units

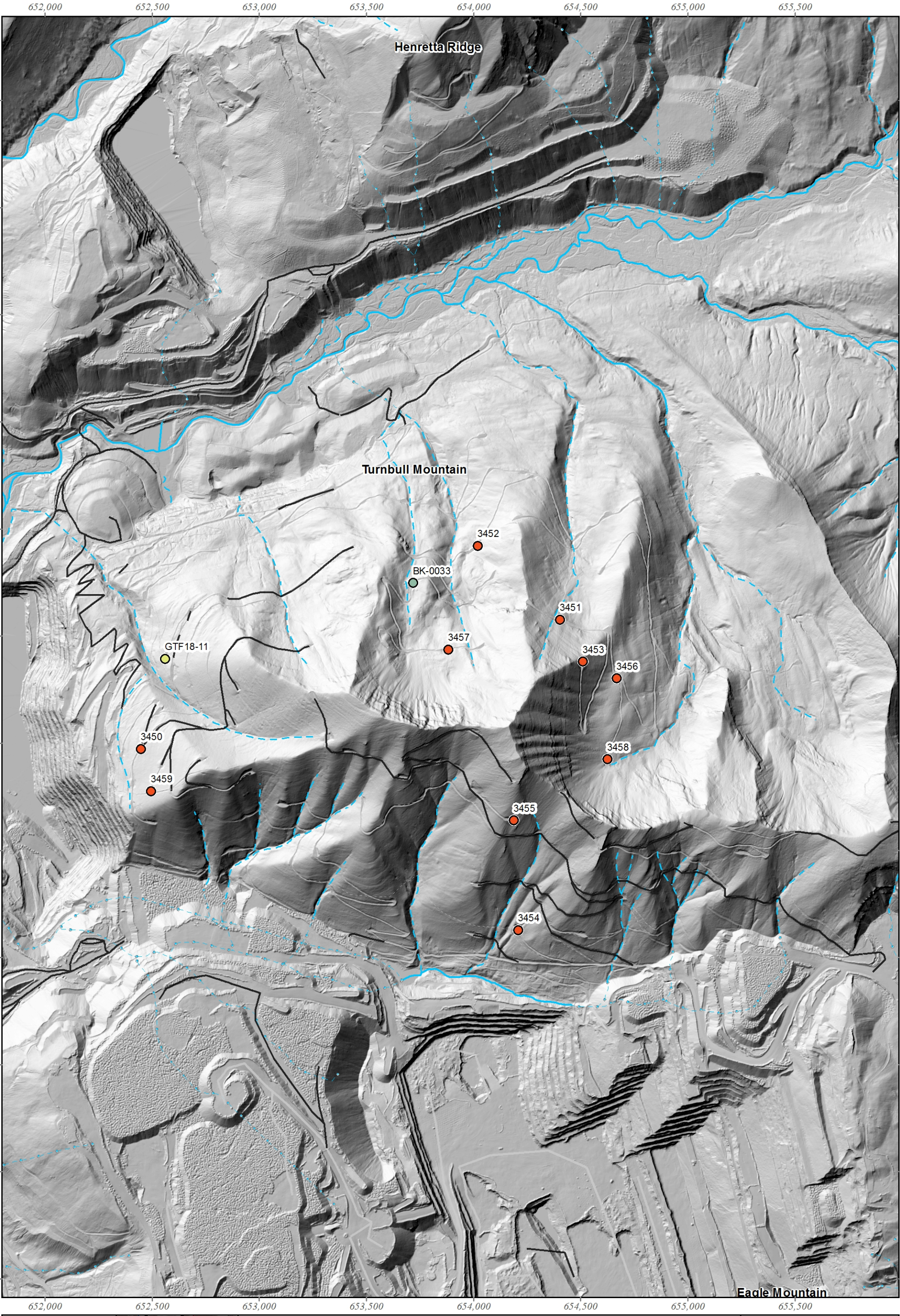
- | | | | |
|--|------------------------------------|---------------------|---------------------|
| Geotech Collars 2018 | 2018 Re-Opened Trail | MYAB Boundary | Stream |
| Geotech Test Pit 2018 | Pre-existing Road | Dissolved Permits | Intermittent Stream |
| RC Collars 2018 | Railway | Cross Section Trace | |
| Lower Cretaceous | | | |
| KC | CROWSNEST FORMATION | | |
| KE | KOOTENAY GROUP ELK FORMATION | | |
| Upper Jurassic and Lower Cretaceous | | | |
| JKMM | MIST MOUNTAIN FORMATION | | |
| JMo | MORRISSEY FORMATION | | |
| JF | FERNIE FORMATION | | |
| Upper Carboniferous and Permian | | | |
| CPRM | ROCKY MOUNTAIN SUPERGROUP | | |
| Lower Carboniferous | | | |
| CEt | RUNDLE GROUP ETHERINGTON FORMATION | | |
| TS | SPRAY RIVER GROUP | | |


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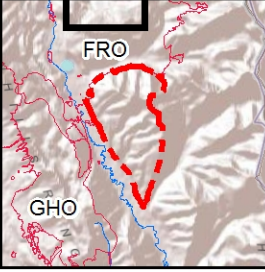


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SCALE: 1:24,000	COORDINATE SYSTEM: NAD 1983 UTM Zone 11N





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Turnbull - 2018

2018 Activity

● RC Drill

● LDC Drill

● Diamond Drill


Access

— Gravel

— Haul Road

— Trail

N



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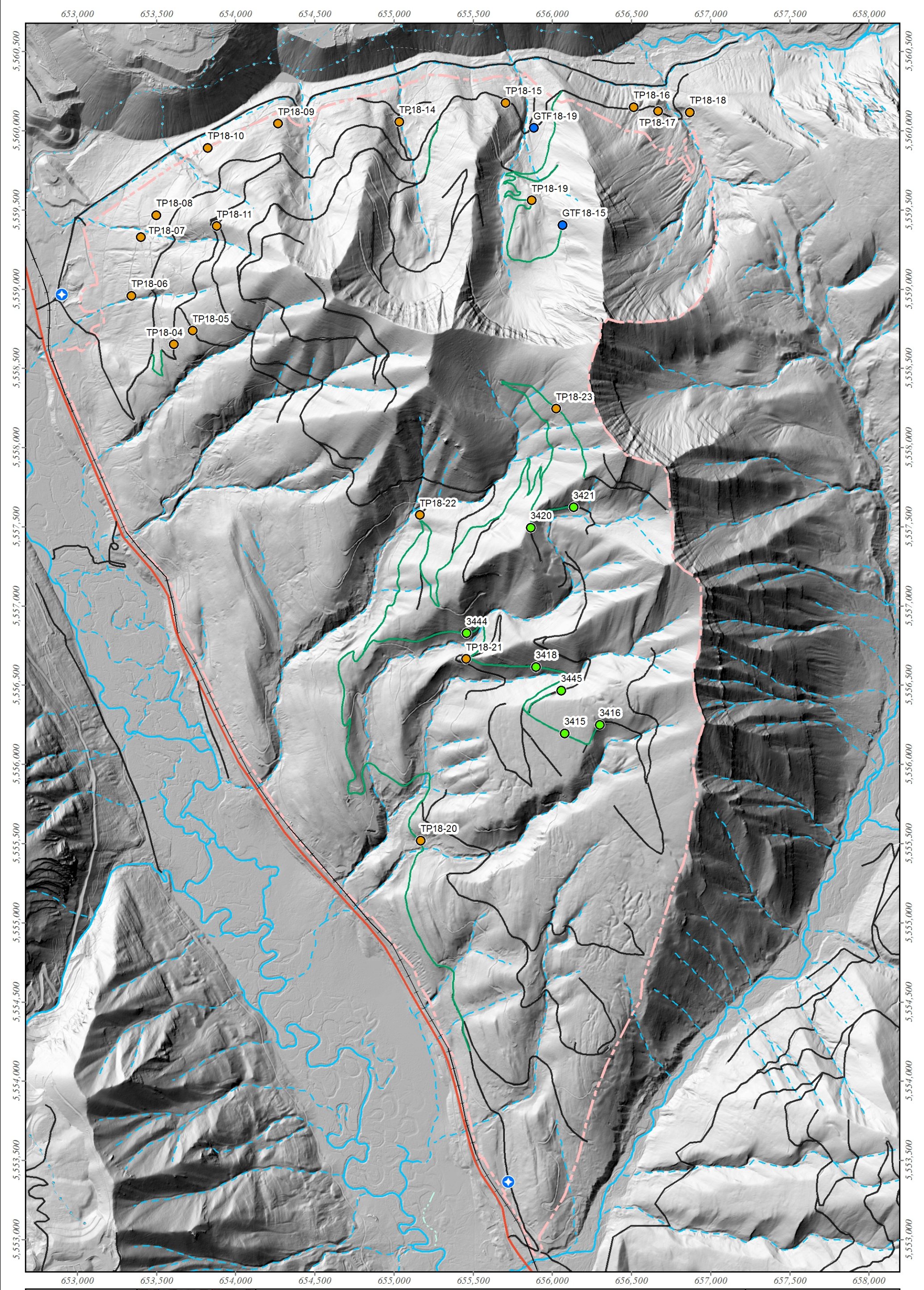
Meters


DATE:
7/28/2020

EXPLORATION PROGRAM:
Castle Mountain

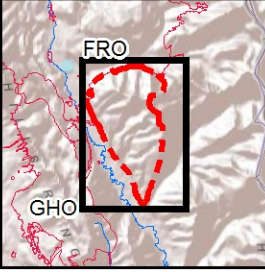
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COORDINATE SYSTEM:
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MYAB Boundary


Laydown

2018 Activities

- RC Drill
- Diamond Drill
- Test Pits

Access

- Paved Surface
- Gravel
- Haul Road
- Other
- Trail
- Railway



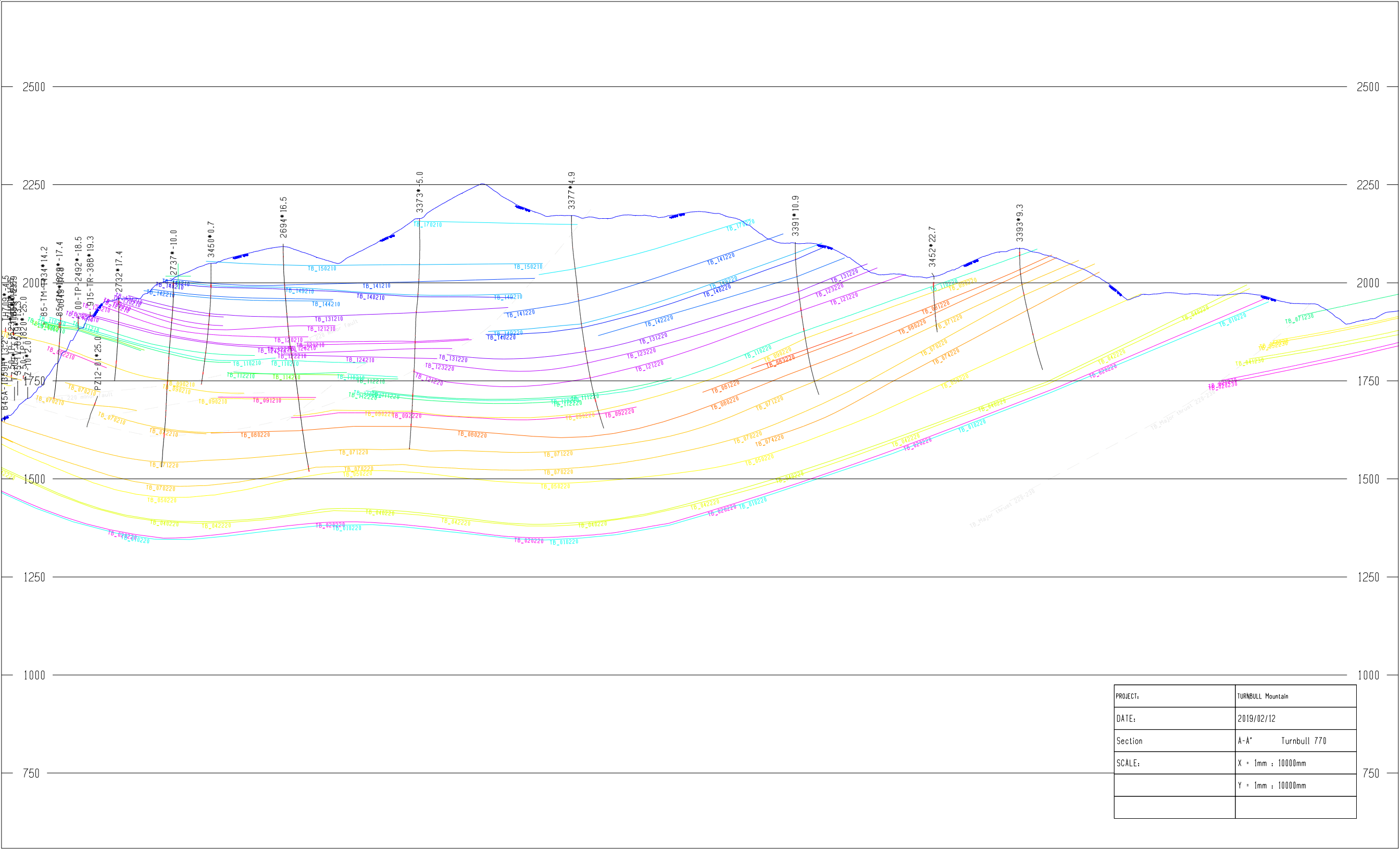
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7/28/2020

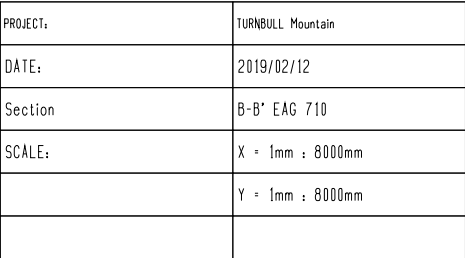
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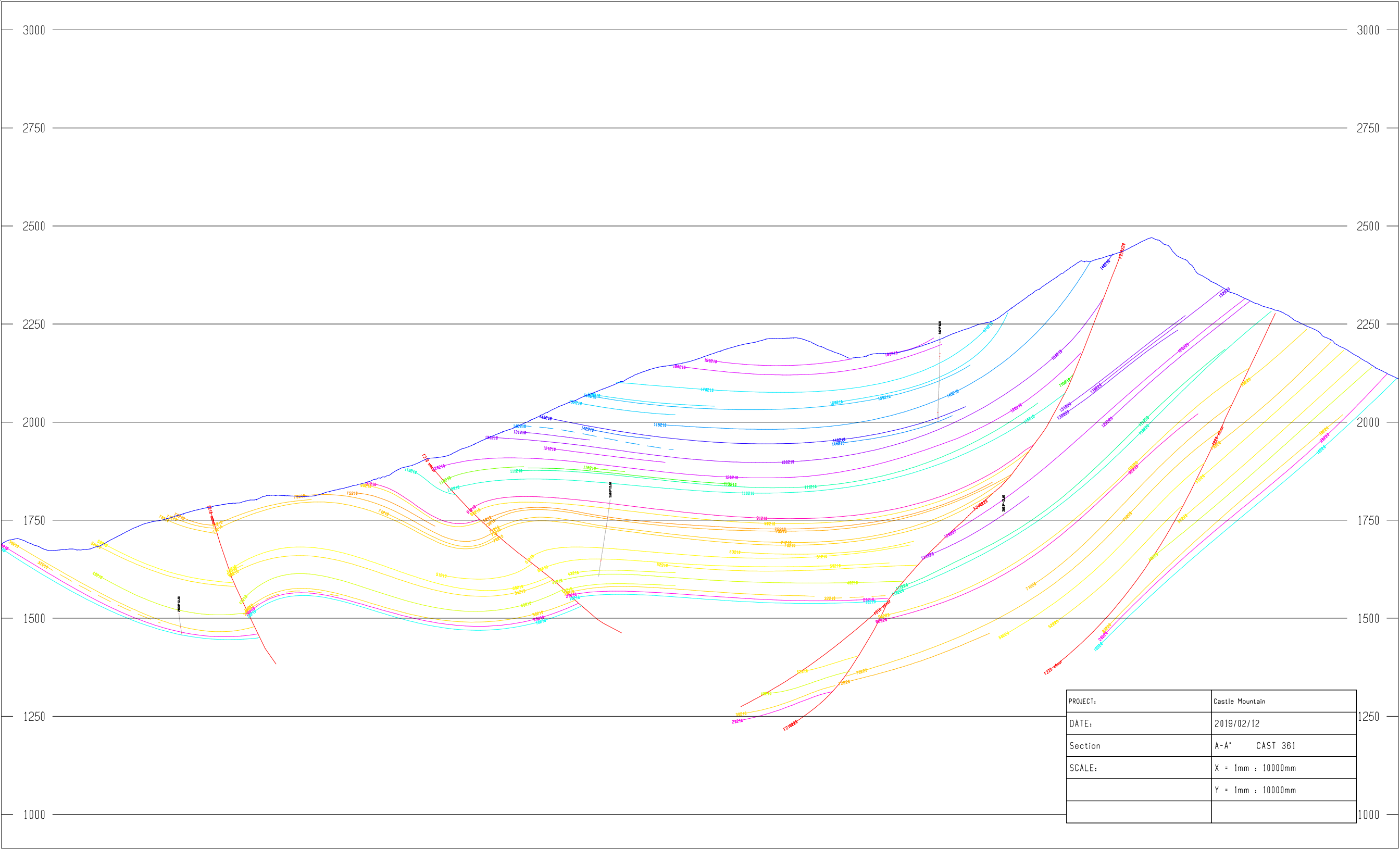
EXPLORATION PROGRAM:
Castle Mountain

COORDINATE SYSTEM:
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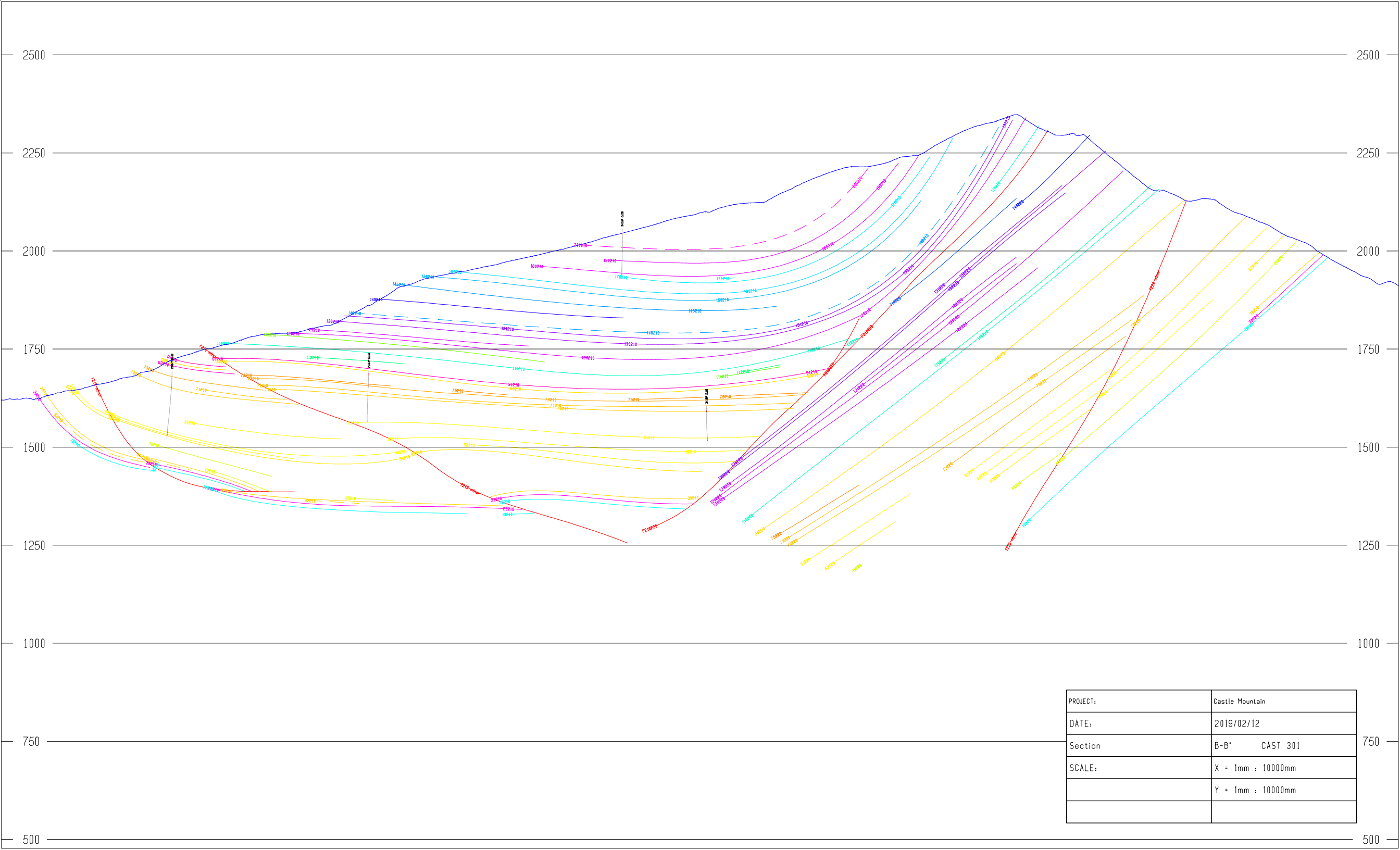


PROJECT:	TURNBULL Mountain
DATE:	2019/02/12
Section	A-A' Turnbull 770
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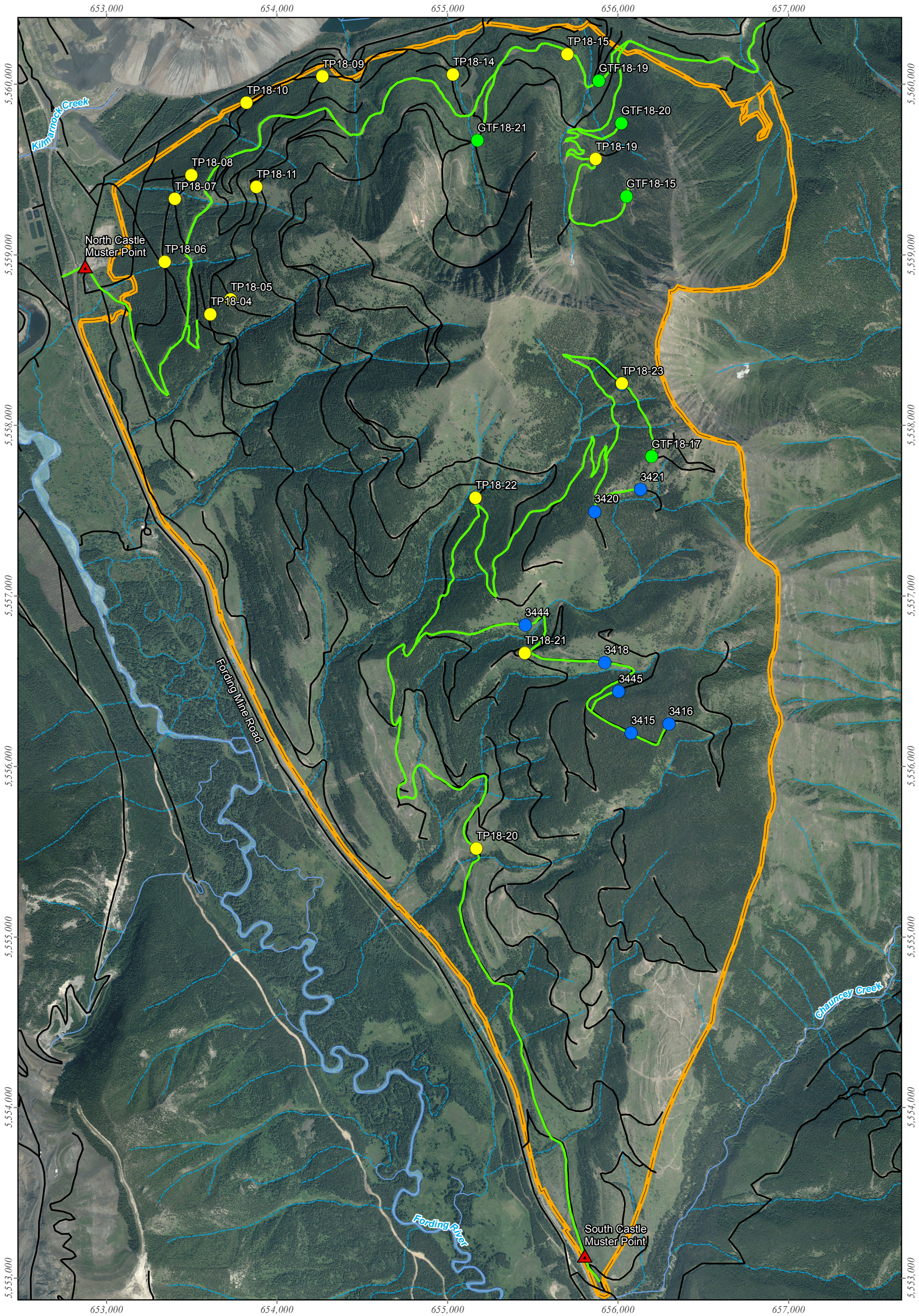




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DATE:	2019/02/12
Section	A-A' CAST 361
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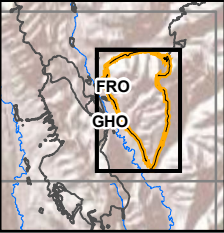


PROJECT:	Castle Mountain
DATE:	2019/02/12
Section	B-B' CAST 301
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	Y = 1mm : 10000mm



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Castle 2018 Summary of Exploration

- Geotech Collars 2018
- Geotech Test Pit 2018
- RC Collars 2018
- ▲ Muster Points
- 2018 Re-Opened Trail (MYAB: 22.65 km)
- Pre-existing Road (MYAB: 94.45 km)
- MYAB Boundary
- Stream
- - - Intermittent Stream

N

0 112.5 225 450 675 Meters

DATE: 2/13/2019	MINE OPERATION: Fording River
SCALE: 1:20,000	COORDINATE SYSTEM: NAD 1983 UTM Zone 11N

Appendix 1- Exploration Cost Statement

Area	Exploration Work Type	Company	Comment	Subtotal
Turnbull	RC Drilling	Foraco Drilling (Calgary)	4007 meters, 10 holes	\$333,873.10
Turnbull	LDC	Foraco Drilling (Calgary)	750 meters, 2 samples	\$215,396.08
Turnbull	HQ Diamond Drilling	GeoTech Drilling	249.7 meters, 1 hole	\$121,756.30
Castle	RC Drilling	Foraco Drilling (Calgary)	3823 meters, 7 holes	\$405,849.10
Castle	HQ Diamond Drilling	Foraco Drilling (Kamloops)	953.3 meters, 3 holes	\$683,825.49
			Total Turnbull	\$671,025.48
			Total Castle	\$1,089,674.59
			Total Drilling	\$1,760,700.07
Turnbull	Geophysical Downhole Logging	Century Wireline Services	4007 meters	\$67,577.55
Castle	Geophysical Downhole Logging	Century Wireline Services	4593 metres	\$87,613.25
			Total Geophysical	\$155,190.80
Turnbull	Road and Pad Building	Tranседent		\$108,087.06
Turnbull	Danger Tree Falling	Nupqu		\$10,764.60
Turnbull	Engineered Road and Pad Design	Vast Resources		\$15,458.00
Castle	Road and Pad Building, Snow removal	McKay		\$490,116.09
Castle	Danger Tree Falling	Nupqu		\$10,764.60
Castle	Engineered Road and Pad Design	Vast Resources		\$15,458.00
Castle	Test Pitting	McKay		\$6,718.80
			Total Turnbull	\$134,309.66
			Total Castle	\$523,057.49
			Total Road and Pad Building	\$657,367.15
Turnbull	Consumables	Various	Drill casing, Sample Bags & Tags, etc.	\$15,000.00
Castle	Consumables	Various	Drill casing, Sample Bags & Tags, etc.	\$15,000.00
			Total Consumables	\$30,000.00
Turnbull	Sample Analysis	Various	Wash, MAA, Petrography	\$74,581.00
Castle	Sample Analysis	Various	Wash, MAA, Petrography	\$74,581.00
			Total Sample Analysis	\$149,162.00
Turnbull	Core logging and Geotechnical Consulting	Tetra Tech		\$61,972.00
Castle	Core logging and Geotechnical Consulting	Stantec		\$226,306.94
			Total Consultants	\$288,278.94
			Total Turnbull	\$1,024,465.69
			Total Castle	\$2,016,233.27
			Total	\$3,040,698.96