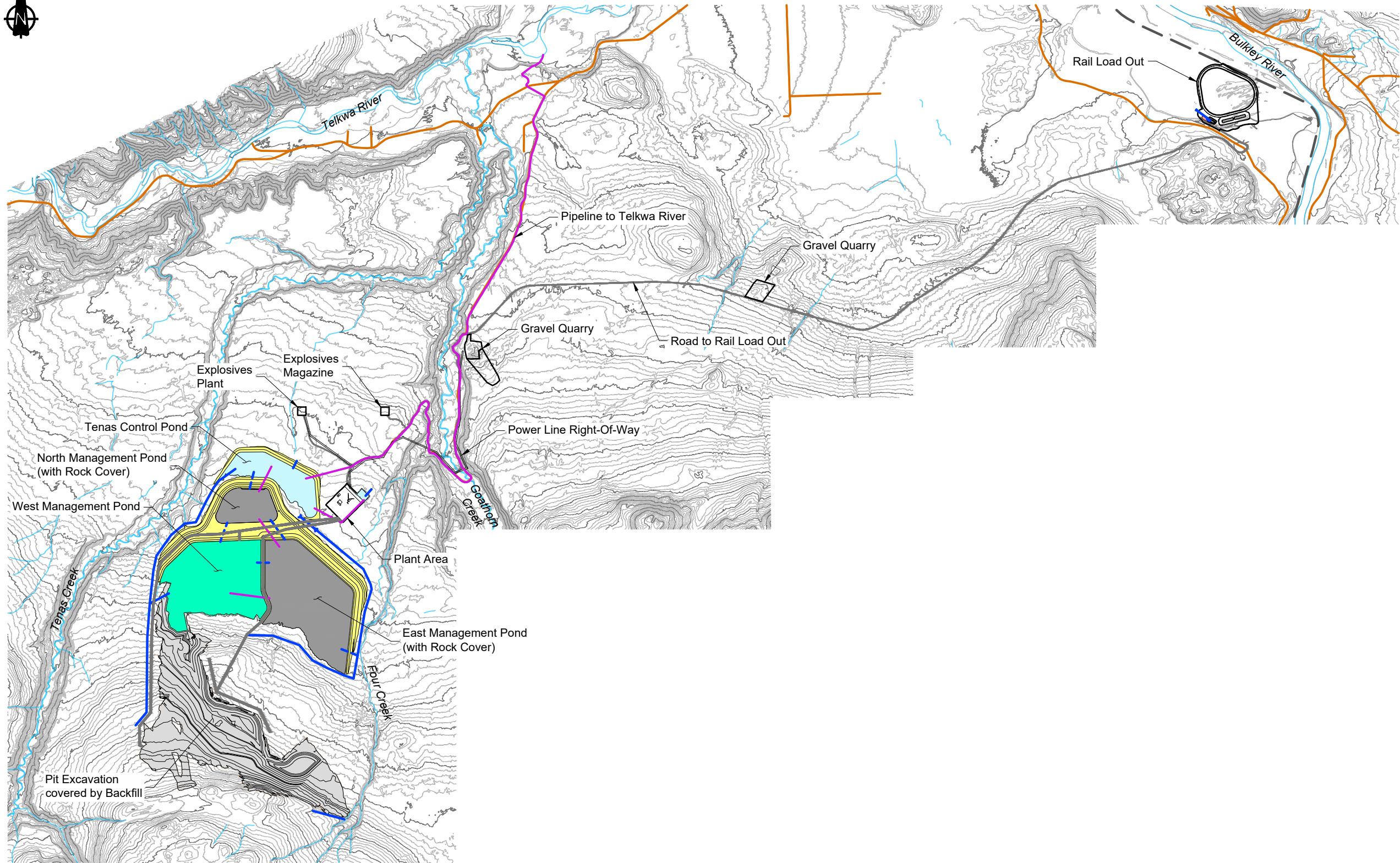




LEGEND

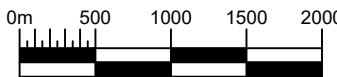
- Water Management Feature
- Spillway
- Existing Watercourse
- Pipeline
- Existing Road
- Proposed Road
- Dams and Buttresses
- Control Pond
- Management Pond
- Backfill / NAG Pile
- Rock Cover

NOTES

- Contours shown at 5.0m intervals.
- All dimensions shown in meters unless otherwise stated.
- Pile designs by SRK Consulting Ltd.

REFERENCE

NAD83 UTM Zone 9.



SRK JOB NO.: 1CT027.004
FILE NAME: Fig19_Mine_Plan.pdf



Tenas Project

Groundwater Technical Report

Mine Plan

DATE: Jan 2021 APPROVED: GF FIGURE: 19

C:\Users\scoward\OneDrive - SRK Consulting\Projects\Telkwa\20210111_Groundwater_Technical_Report\1CT027_004_Groundwater_Technical_Report.aprx

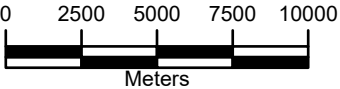


LEGEND

- City/Town
- Groundwater LSA
- Groundwater RSA
- Tenas Access Corridor
- Rail Line
- Highway
- Road
- Project Area
- Waterbody
- Wetland
- Watercourse
- Park or Protected Area
- First Nation Reserve
- Municipal Area

NOTES
1. All mapped features are approximate and should be used for discussion purposed only.

REFERENCES
NAD 1983 UTM Zone 9N
Project features: Allegiance Coal, 2020
Basedata: Government of British Columbia
Basemap: World Topo Base

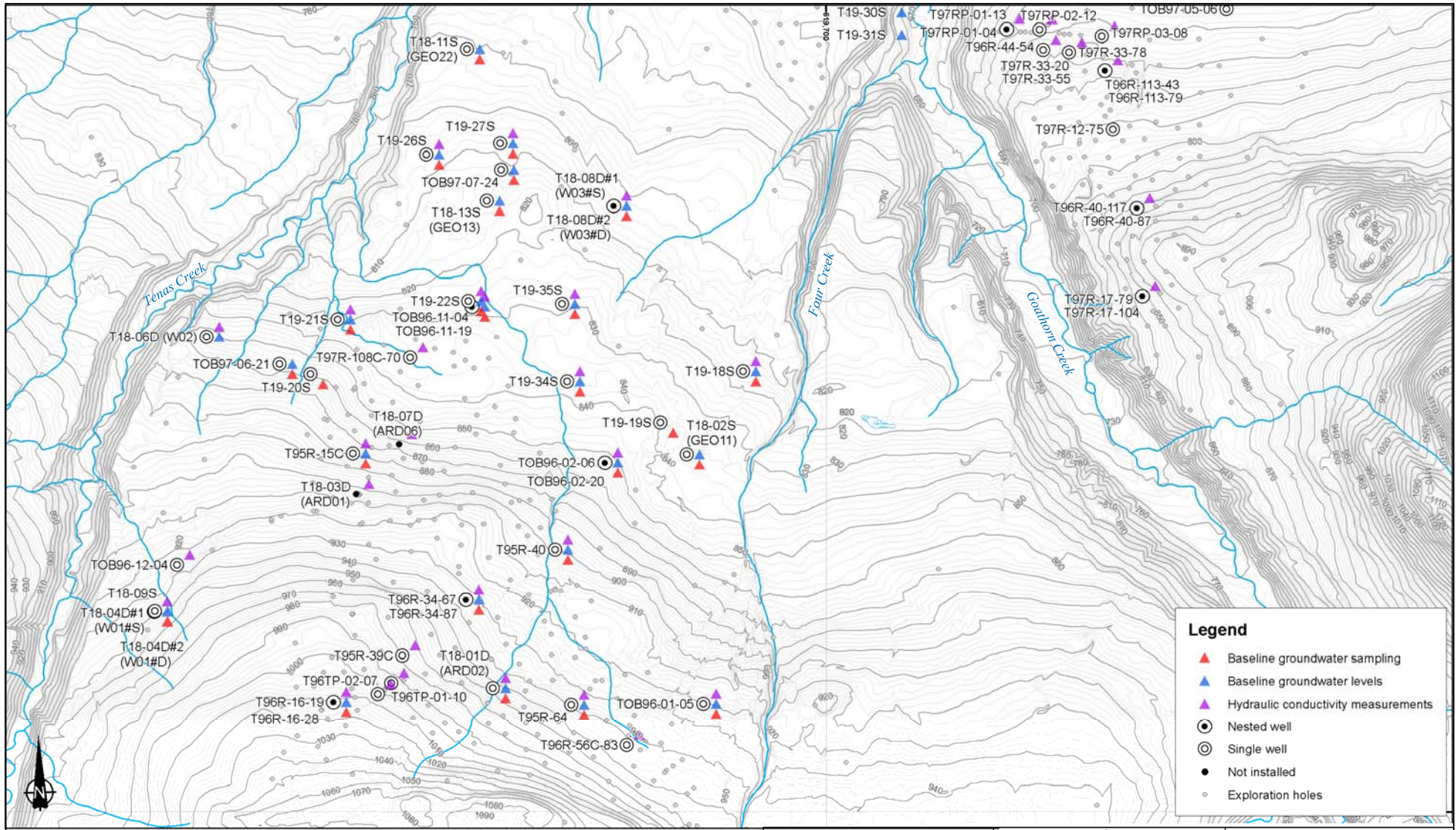


SRK JOB NO: 1CT027.004

FILENAME: Fig20_Groundwater_RSA_LSA.pdf

Tenas Project

Groundwater Technical Report		
Local Study Area (LSA) and Regional Study Area (RSA)		
Date: Jan 2021	Approved: GF	Figure: 20



0 0.325 0.65 1.3 Kilometers

Coordinate System: NAD 1983 UTM Zone 9N
Projection: Transverse Mercator
Datum: North American 1983



Job No: 1CT027.004
Filename: Fig21_MW locations in Tenas Area



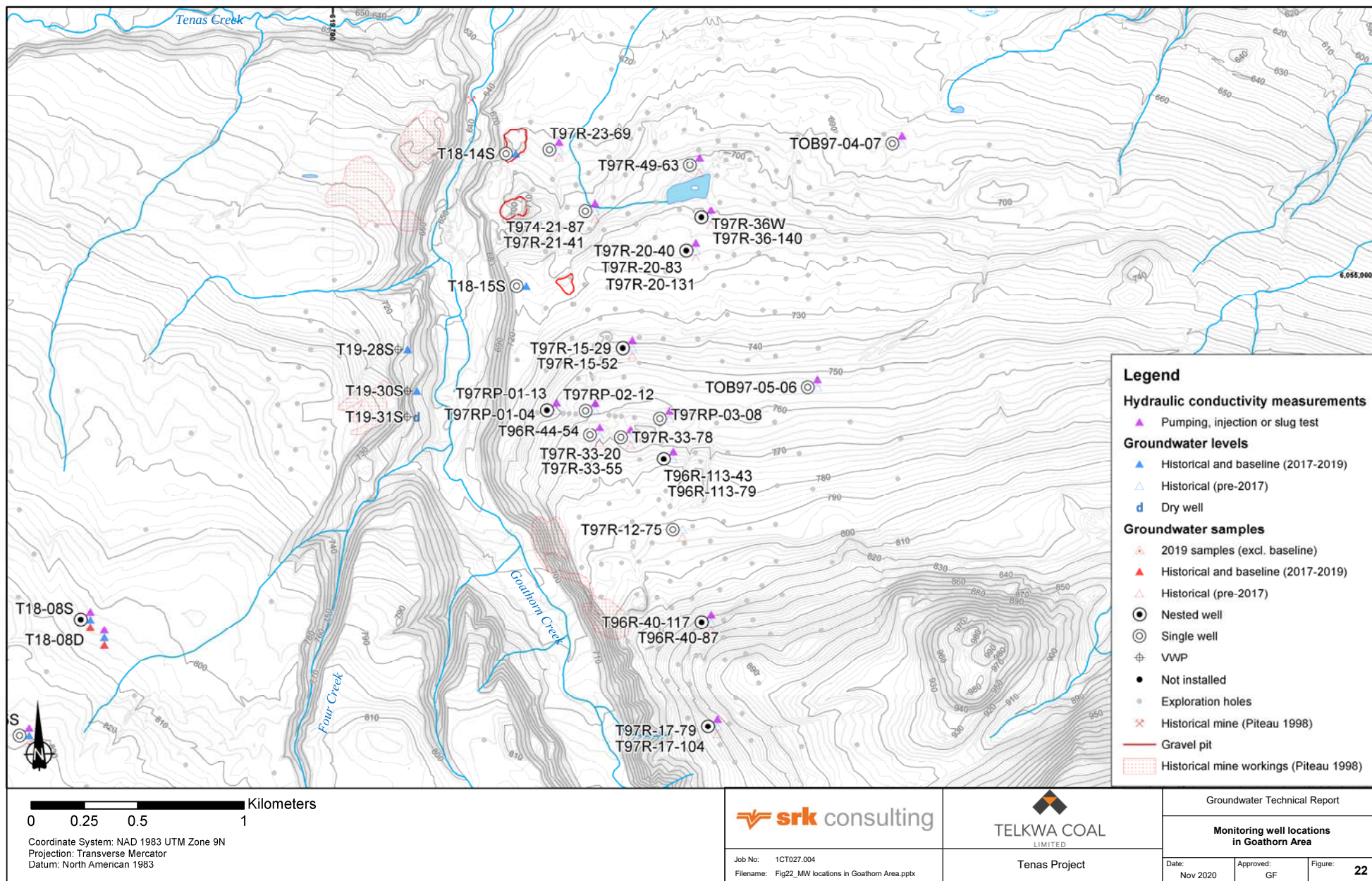
Tenas Project

Groundwater Technical Report

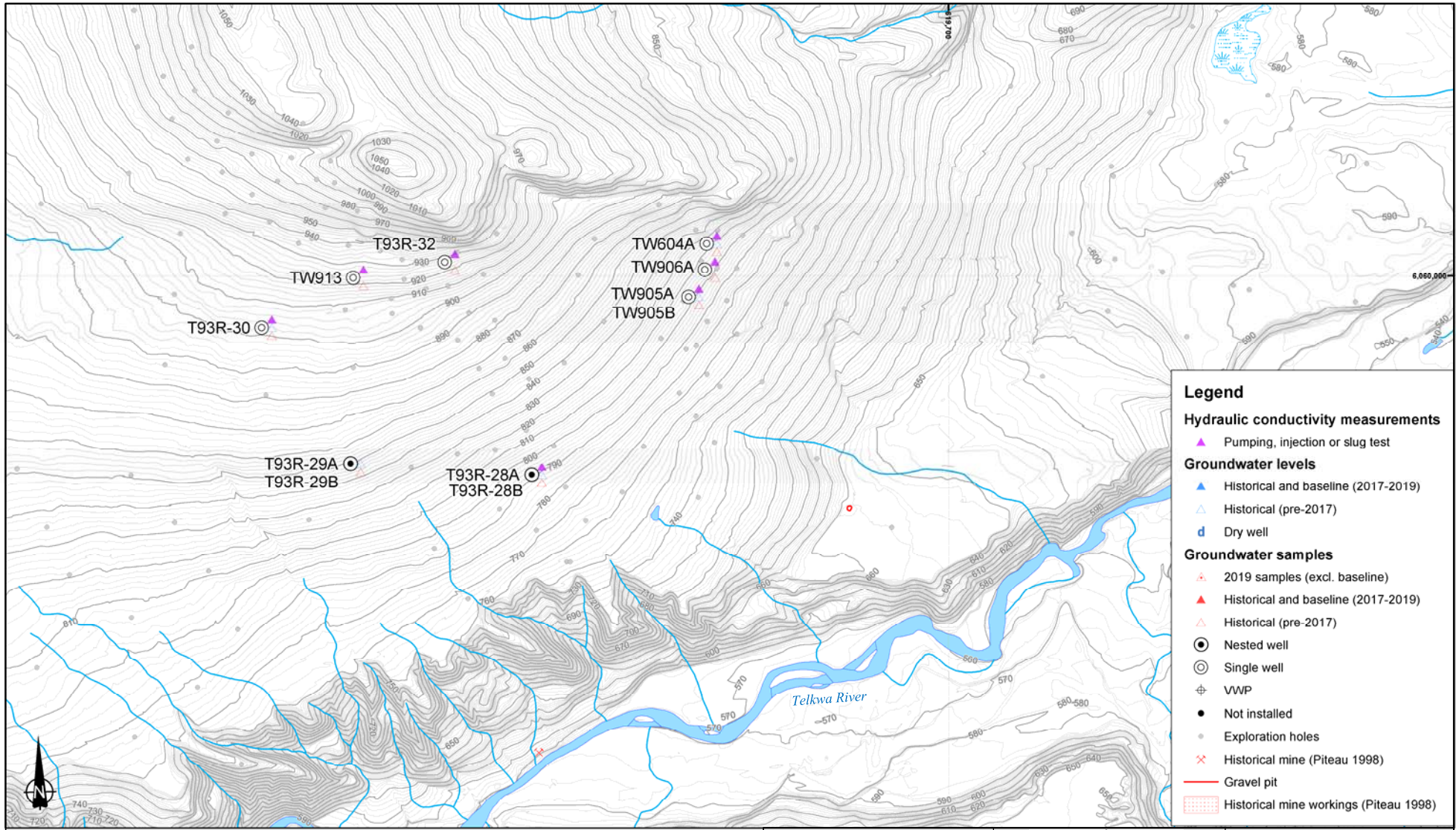
Monitoring well locations
in Tenas Area

Date: Nov 2020	Approved: GF	Figure: 21
-------------------	-----------------	---------------

\\NA\SVR00\Projects\01_SITES\Telkwa Coal\020_Site-Wide_Data\GIS\Mapset\Figure Maps\1CT027_004_Telkwa_EA_Fig21_GoathornMW.mxd



\\NA\SVR00\Projects\01_SITES\Telkwa Coal\020_Site-Wide_Data\GIS\Mapset\Figure Maps\1CT027_004_Telkwa_EA_Fig23_NorthMW.mxd



0 0.25 0.5 1 Kilometers

Coordinate System: NAD 1983 UTM Zone 9N
Projection: Transverse Mercator
Datum: North American 1983



Job No: 1CT027.004
Filename: Fig23_MW locations in North Area.pptx



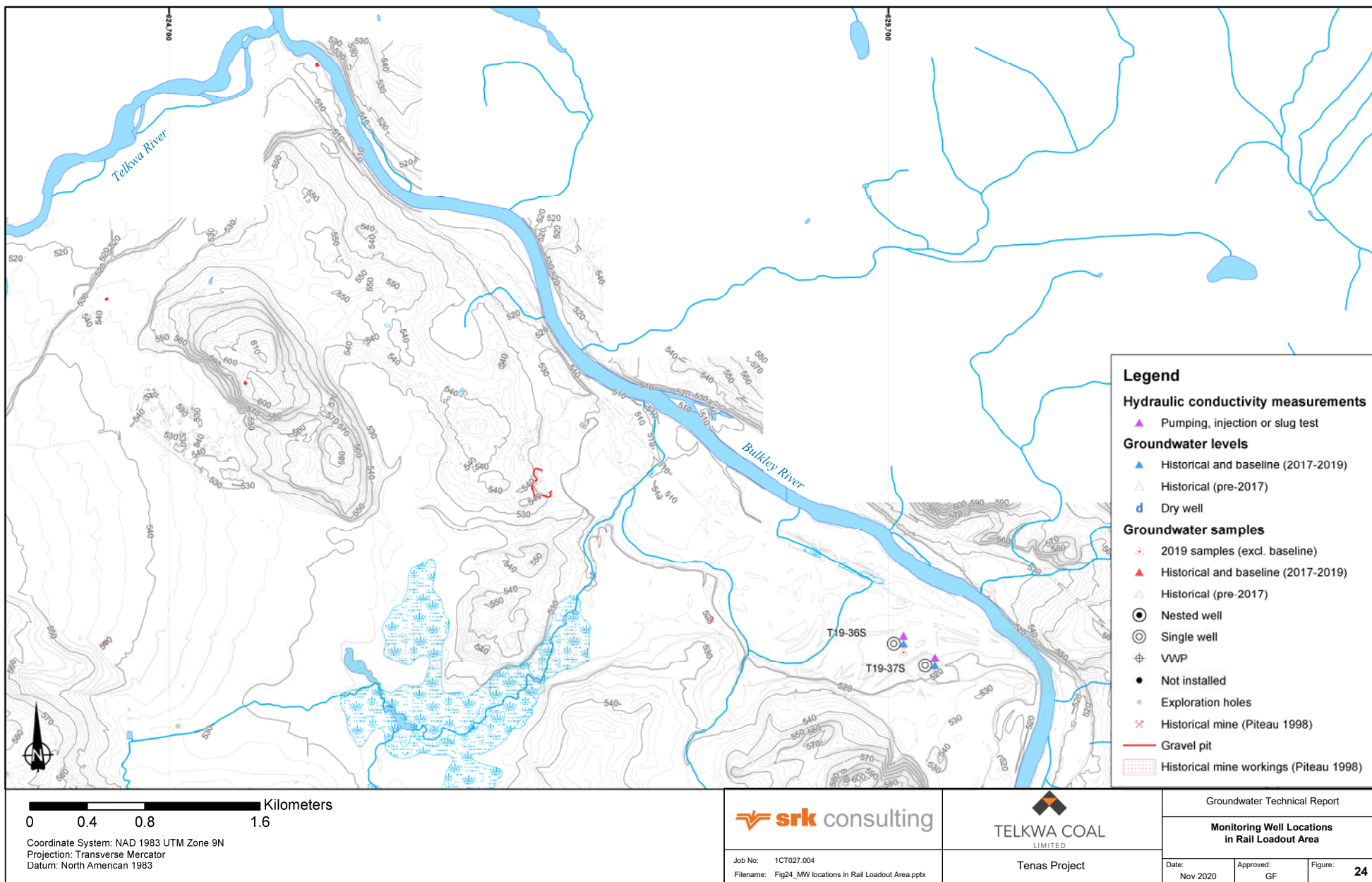
Tenas Project

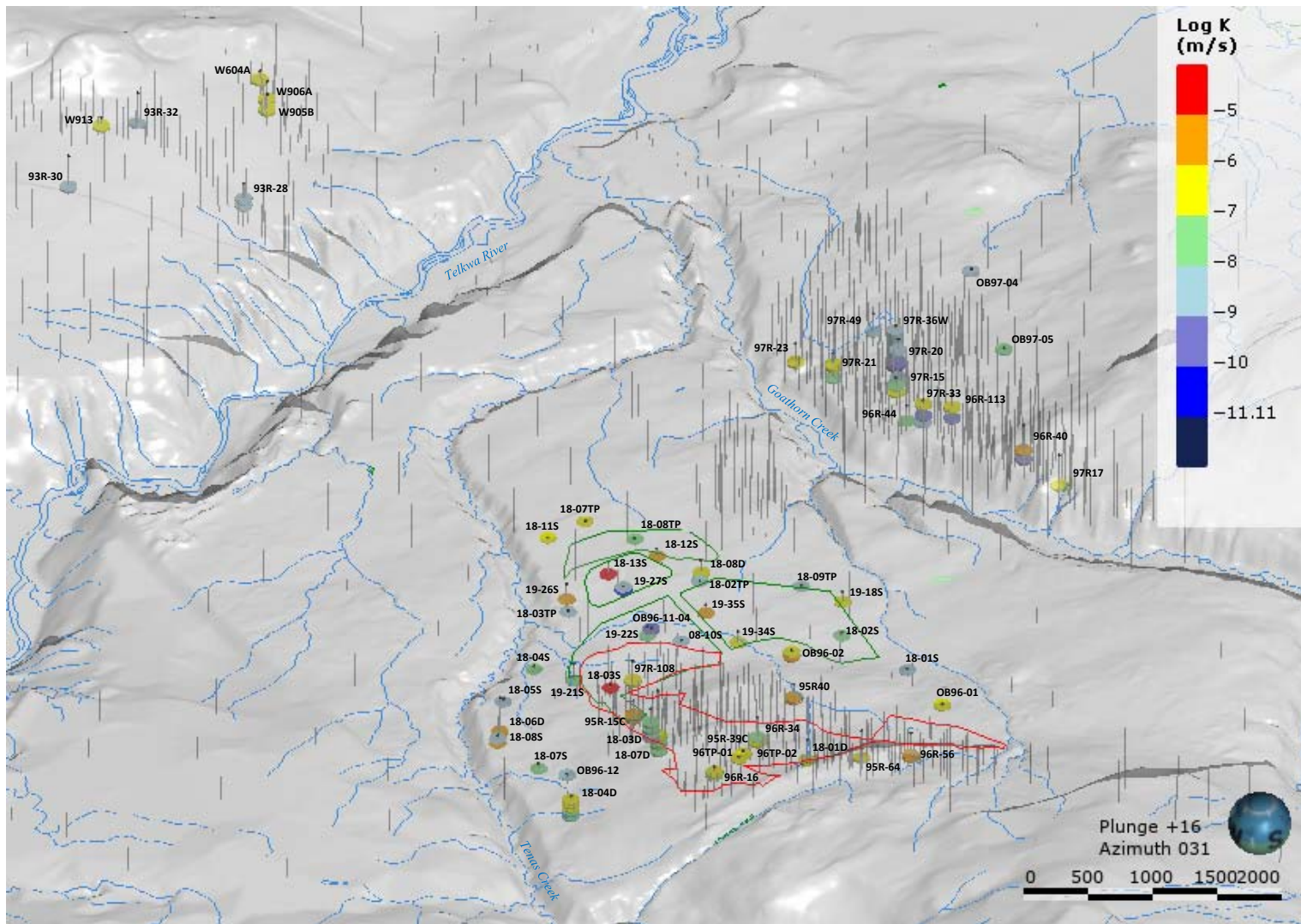
Groundwater Technical Report

Monitoring Well Locations
in North Area

Date: Nov 2020	Approved: GF	Figure: 23
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\\NA\SVR00\Projects\01_SITES\Telkwa Coal\020_Site-Wide_Data\GIS\MapSet\Figure Maps\1CT027_004_Telkwa_EA_Fig23_RailLoadoutMW.mxd





- Footprint of the proposed management ponds and control pond
- Footprint of the proposed pit



Job No: 1CT027.004
Filename: Fig25_3d perspctv K tests.pptx

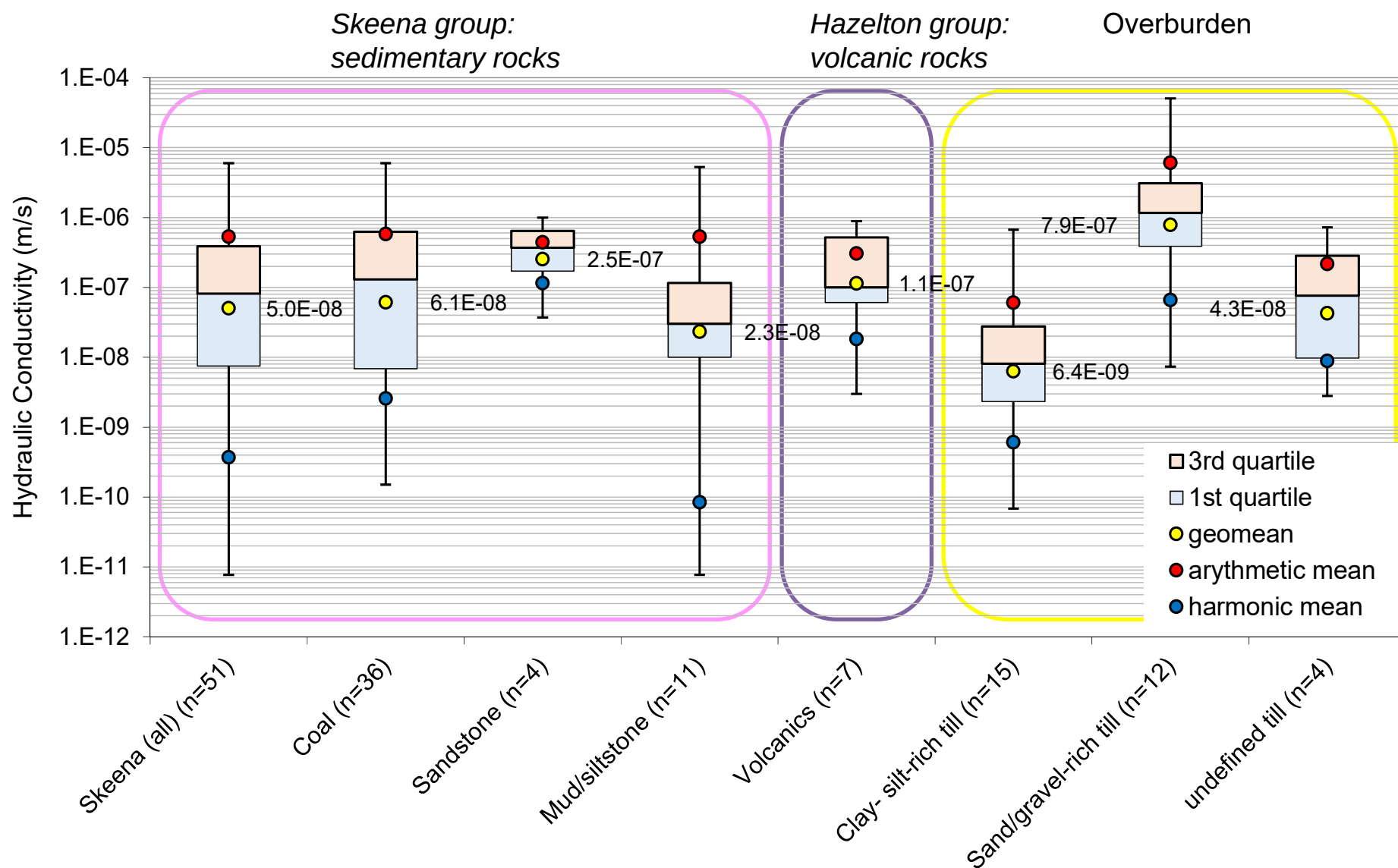


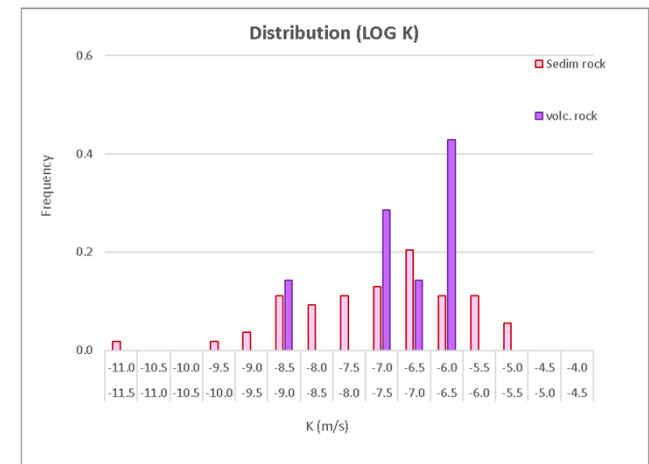
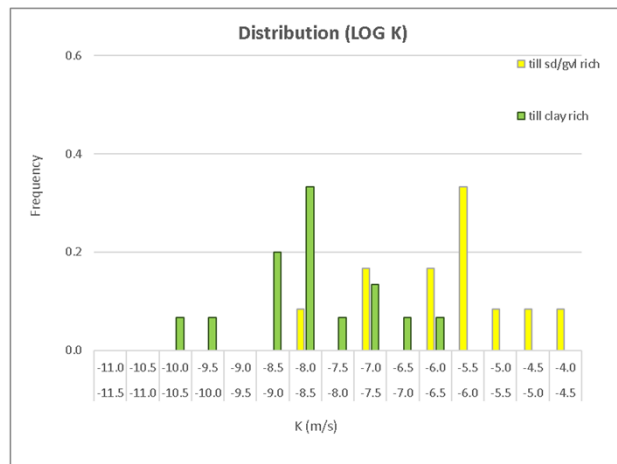
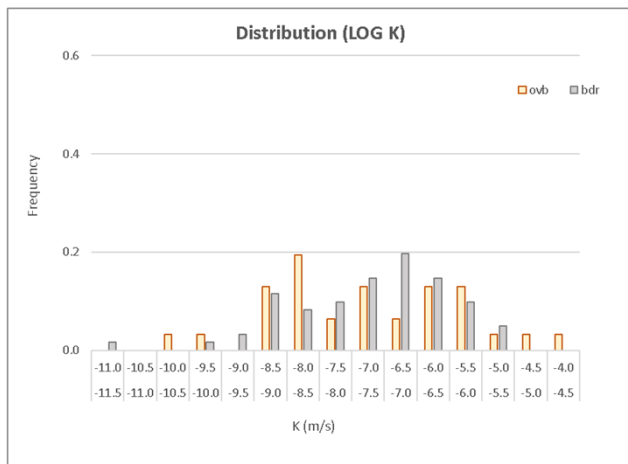
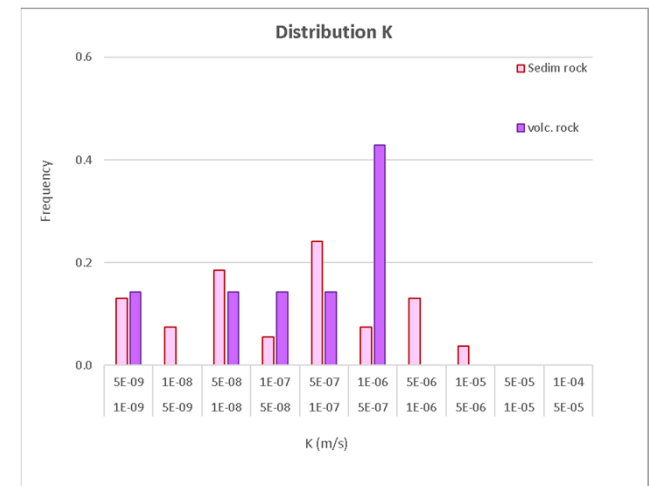
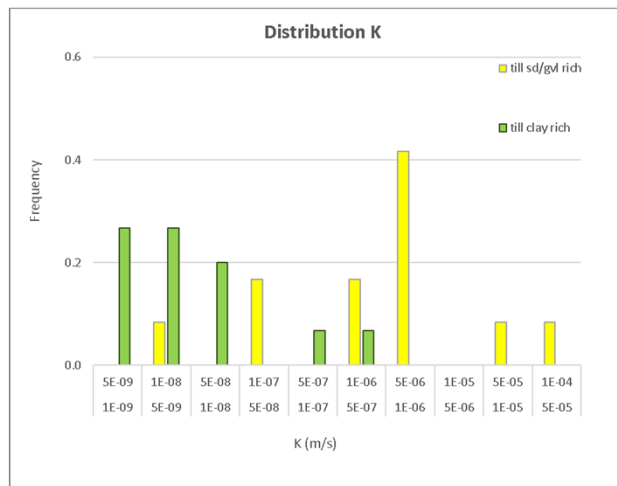
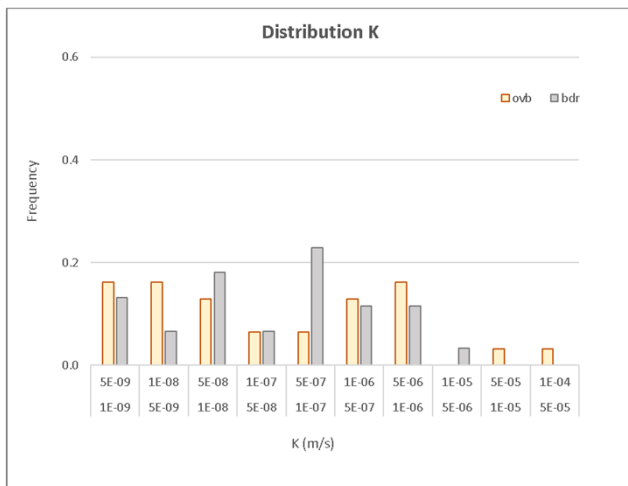
Tenas Project

Groundwater Technical Report

3D perspective view of the hydraulic conductivity measurements

Date: Oct 2020	Approved: GF	Figure: 25
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Note:

ovb, overburden.

bdr, bedrock.

till sd/gvl rich, sand-gravel-rich till.

till clay rich, silt-clay rich till.

sedim rock, sedimentary rocks.

volc rock, volcanic rocks.



Job No: 1CT027.004

Filename: Fig27_K distributions.pptx



Tenas Project

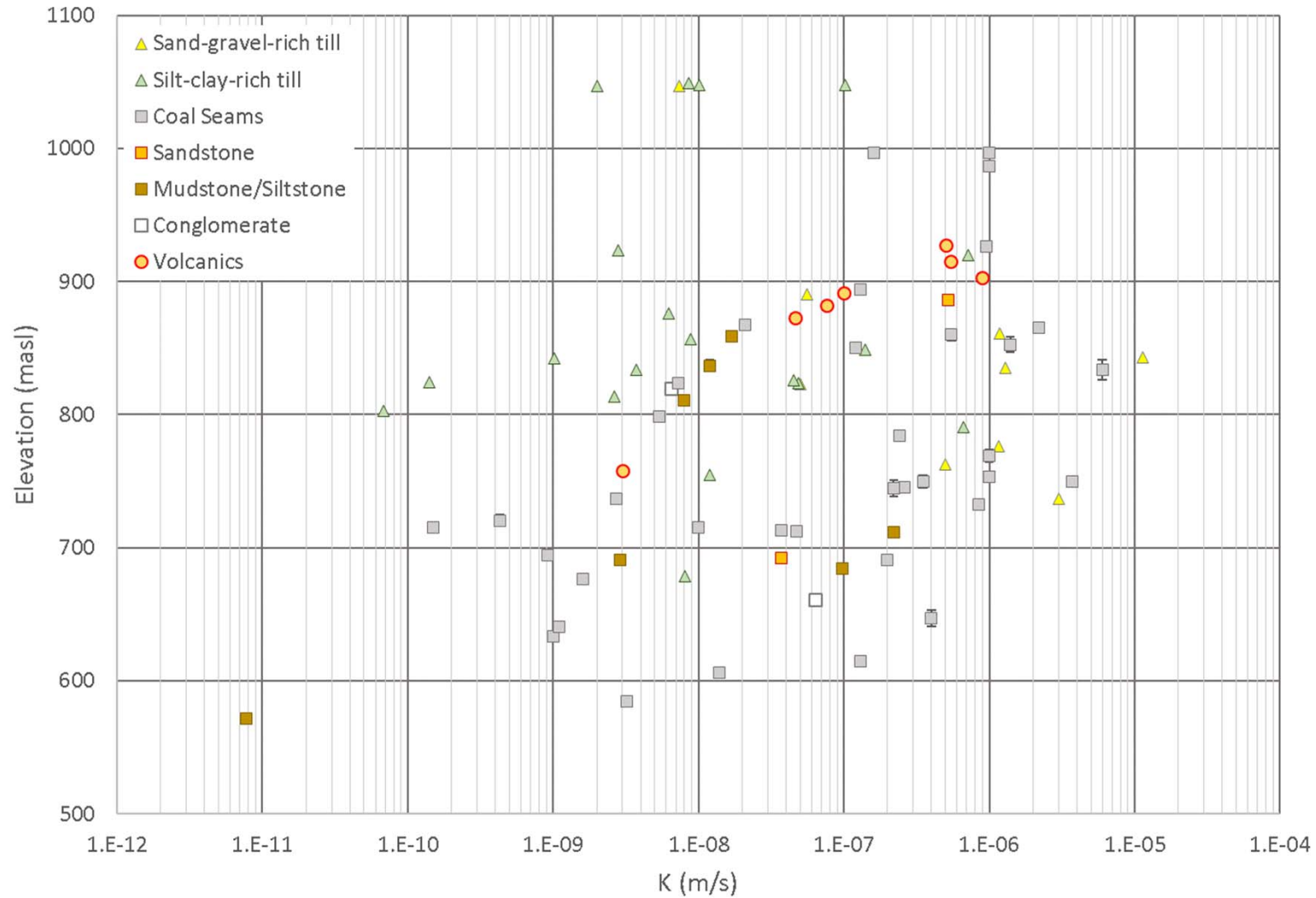
Groundwater Technical Report

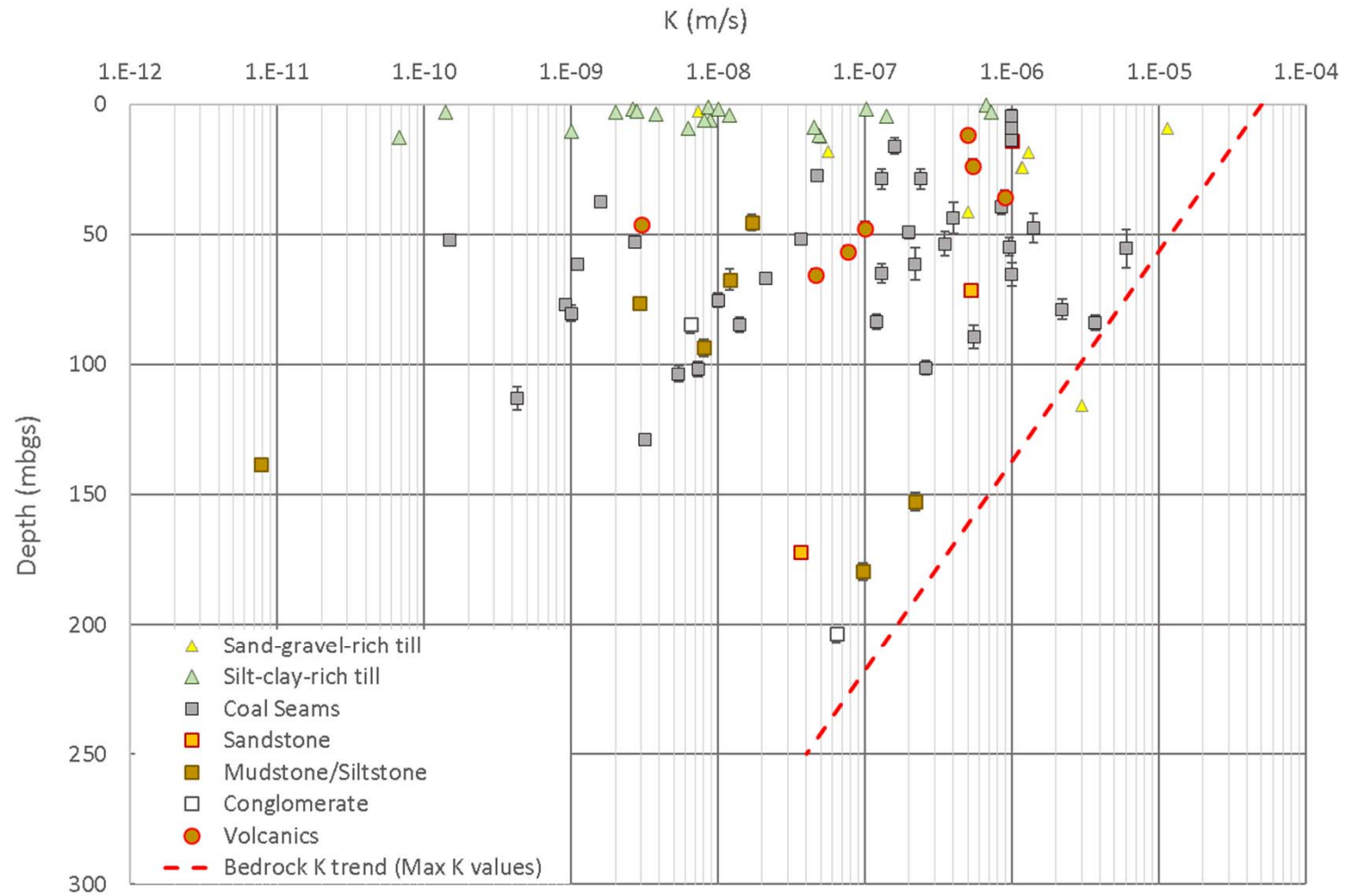
**Distribution of K measurements
by lithological types**

Date:
Oct 2020

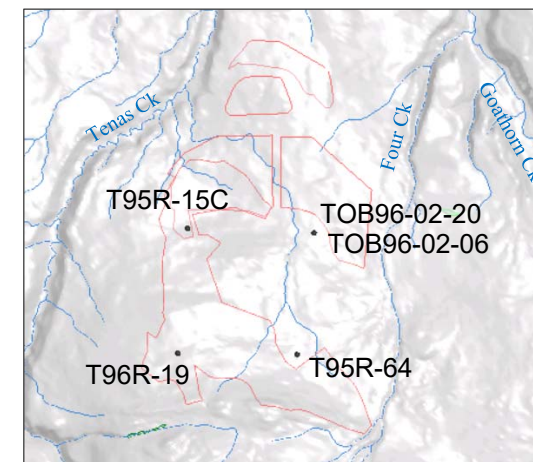
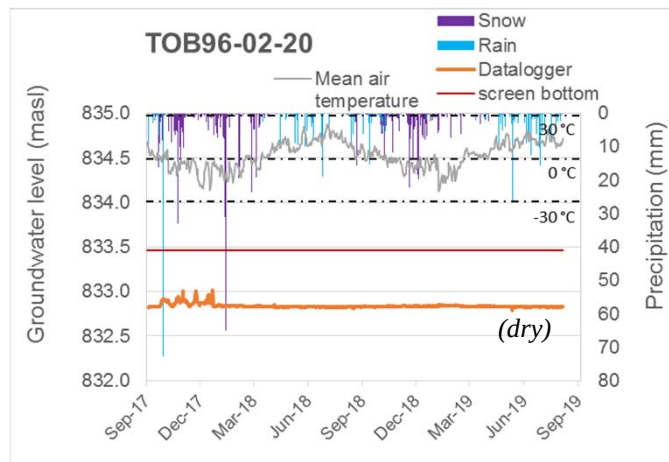
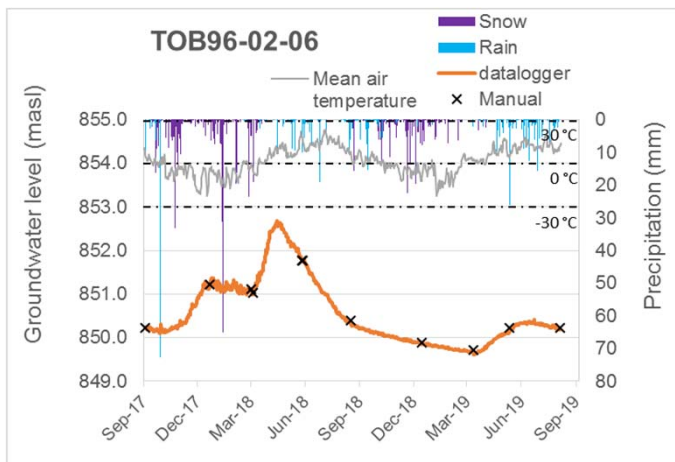
Approved:
GF

Figure: **27**

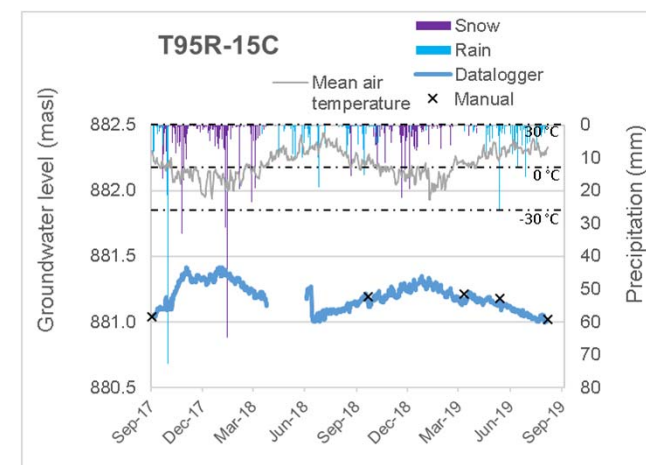
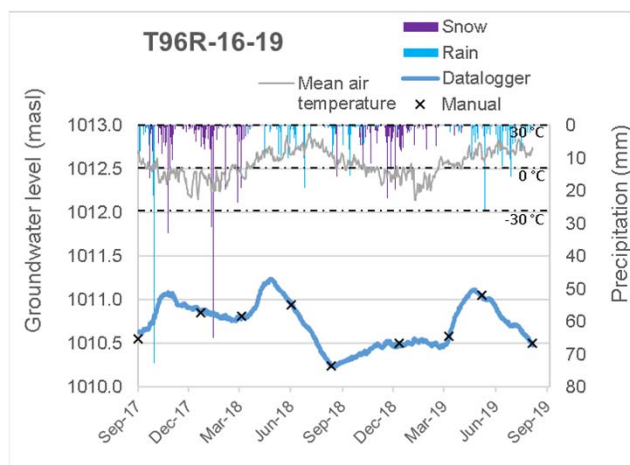
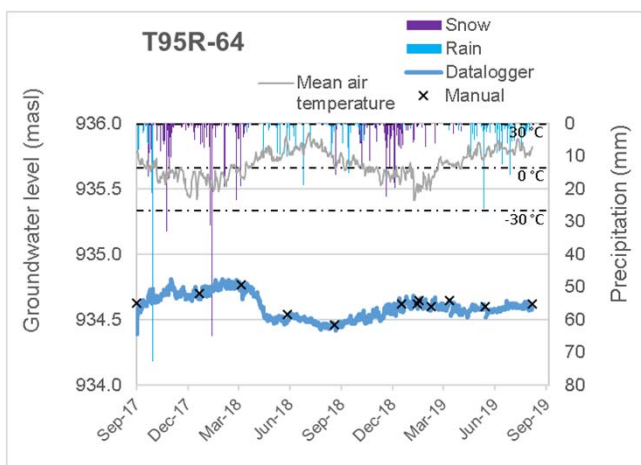


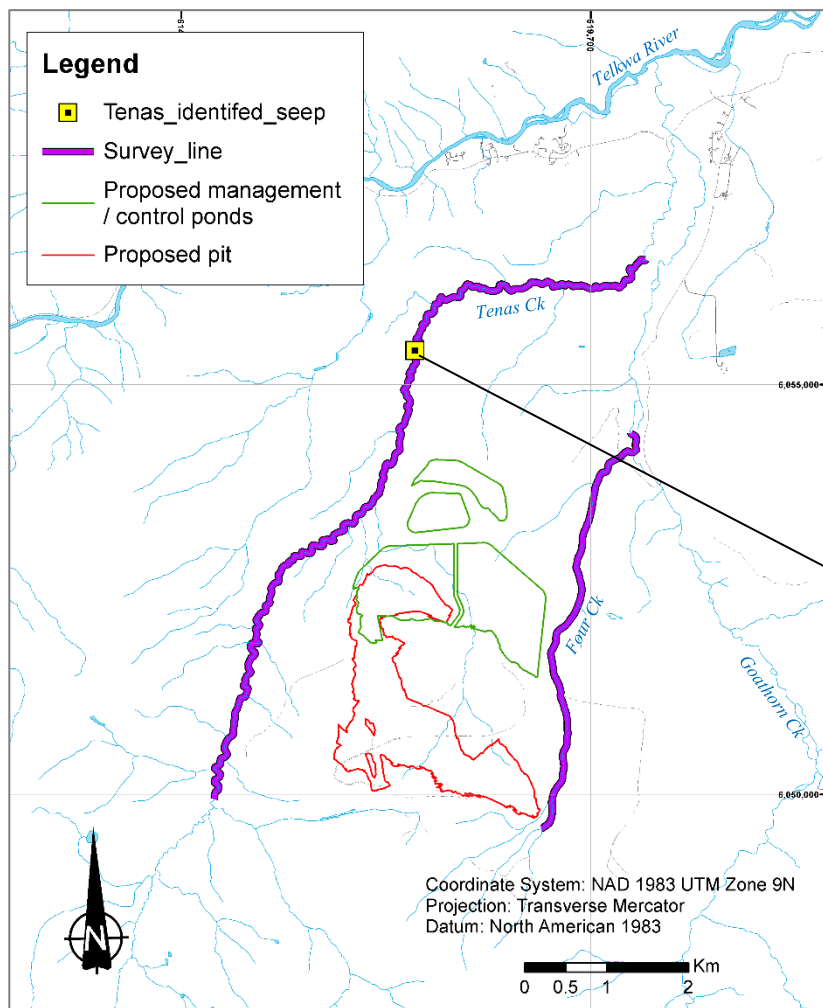


Level observations in overburden



Level observations in bedrock





Tenas seep located at E 617555 N6055416.
Photographed on Dec. 15th 2017.



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Groundwater Technical Report

Seep survey

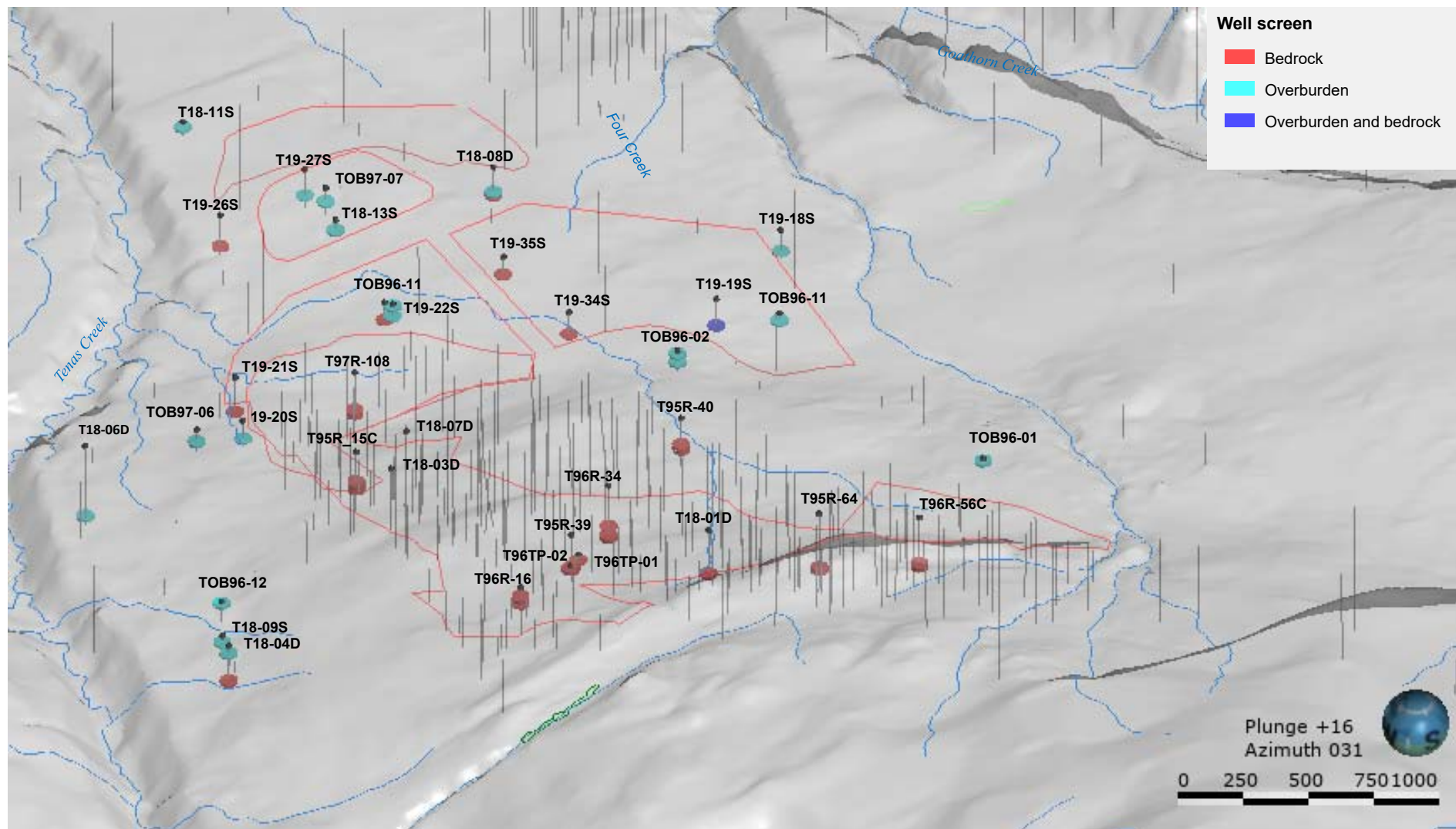
Job No: 1CT027.002
Filename: Fig32_Seep Survey.pptx

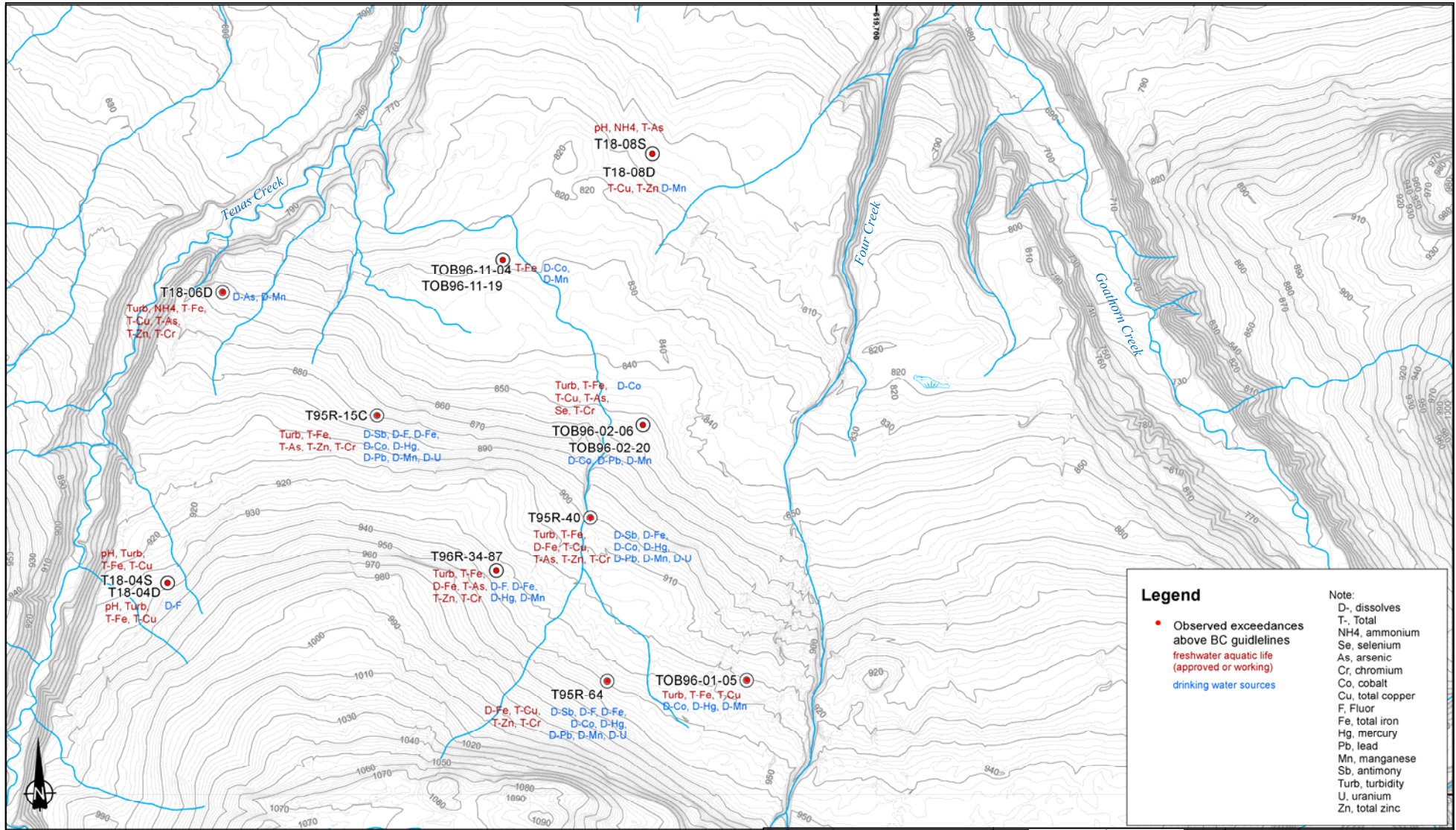
Tenas Project

Date:
12 Nov. 2018

Approved:
GF

Figure: **32**





0 0.3 0.6 1.2 Kilometers

Coordinate System: NAD 1983 UTM Zone 9N
Projection: Transverse Mercator
Datum: North American 1983



Job No: 1CT027.004
Filename: Fig34_GWQ-Exceedances Tenas Area.pptx

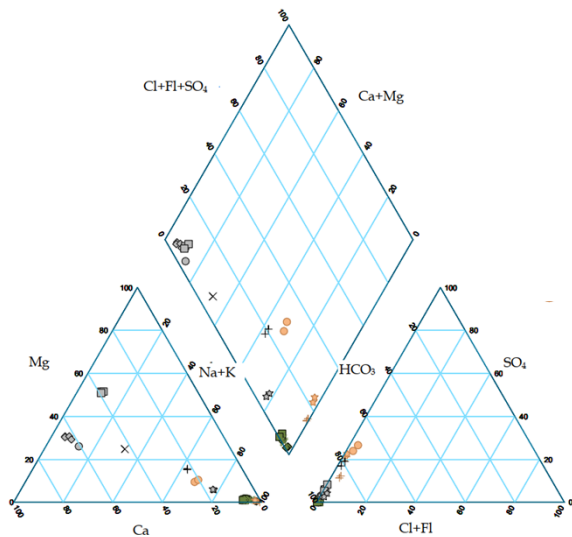


Tenas Project

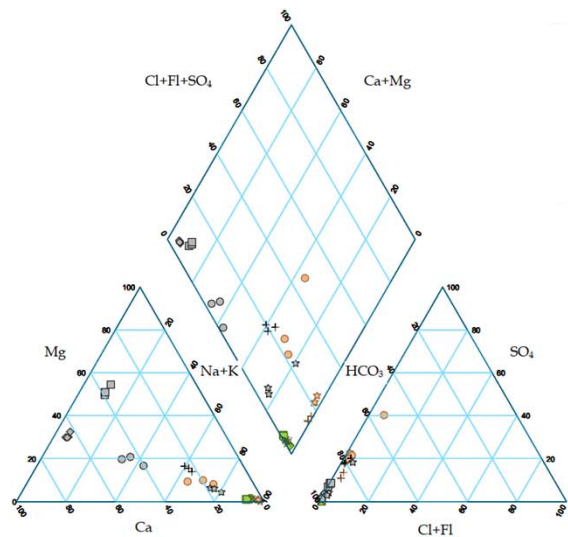
Groundwater Technical Report

Groundwater quality exceedances
observed in the 2020 Tenas baseline data

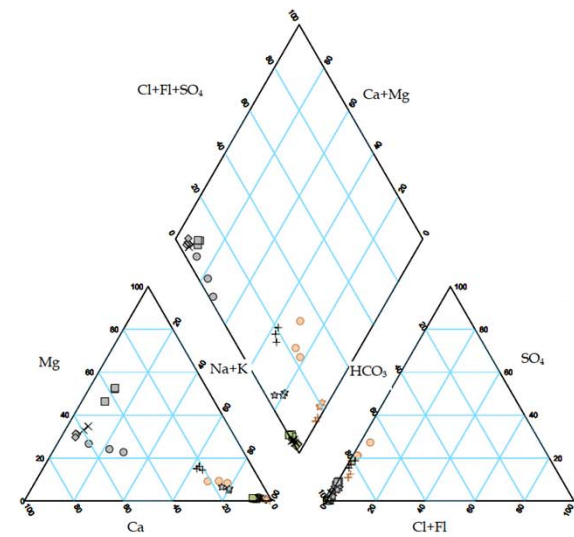
Date: Jan 2021	Approved: GF	Figure: 34
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Project wells, September to November Historical, and 2017 to 2019 Baseline Data ⁽¹⁾



Project wells, January and March/April 2018 and 2019 Baseline Data ⁽²⁾



Project wells, June to August, Historical, and 2017 to 2019 Baseline Data ⁽³⁾

Project wells

Bedrock Wells

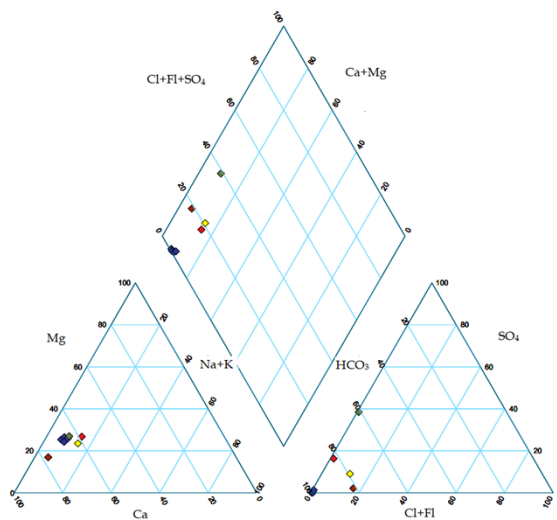
- ◆ T95R-15C
- T95R-40
- T95R-64
- × T96R-34-87
- + W1 Deep (T18-04D#2)
- ★ W1 Shallow (T18-04D#1)
- W3 Deep (T18-08D#2)

Overburden Wells

- TOB96-01-05
- ◆ TOB96-02-06
- TOB96-11-04
- ☆ W2 (T18-06D)
- + W3 Shallow (T18-08D#1)

Private domestic wells

- ◆ Beukema
- ◆ Kerr
- ◆ Ragula
- ◆ Schmike
- ◆ Shearer



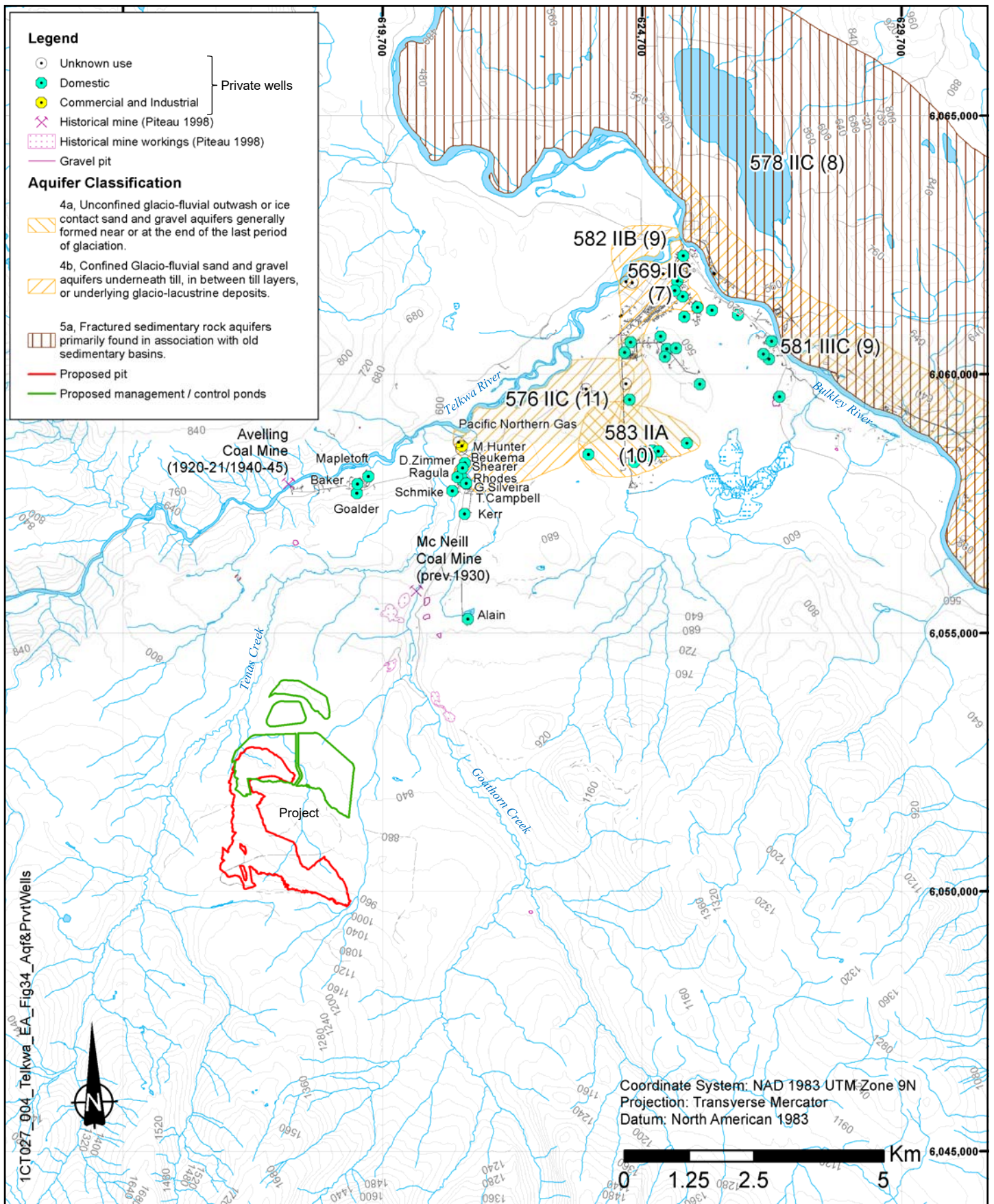
Residential wells, Yearly average 2019

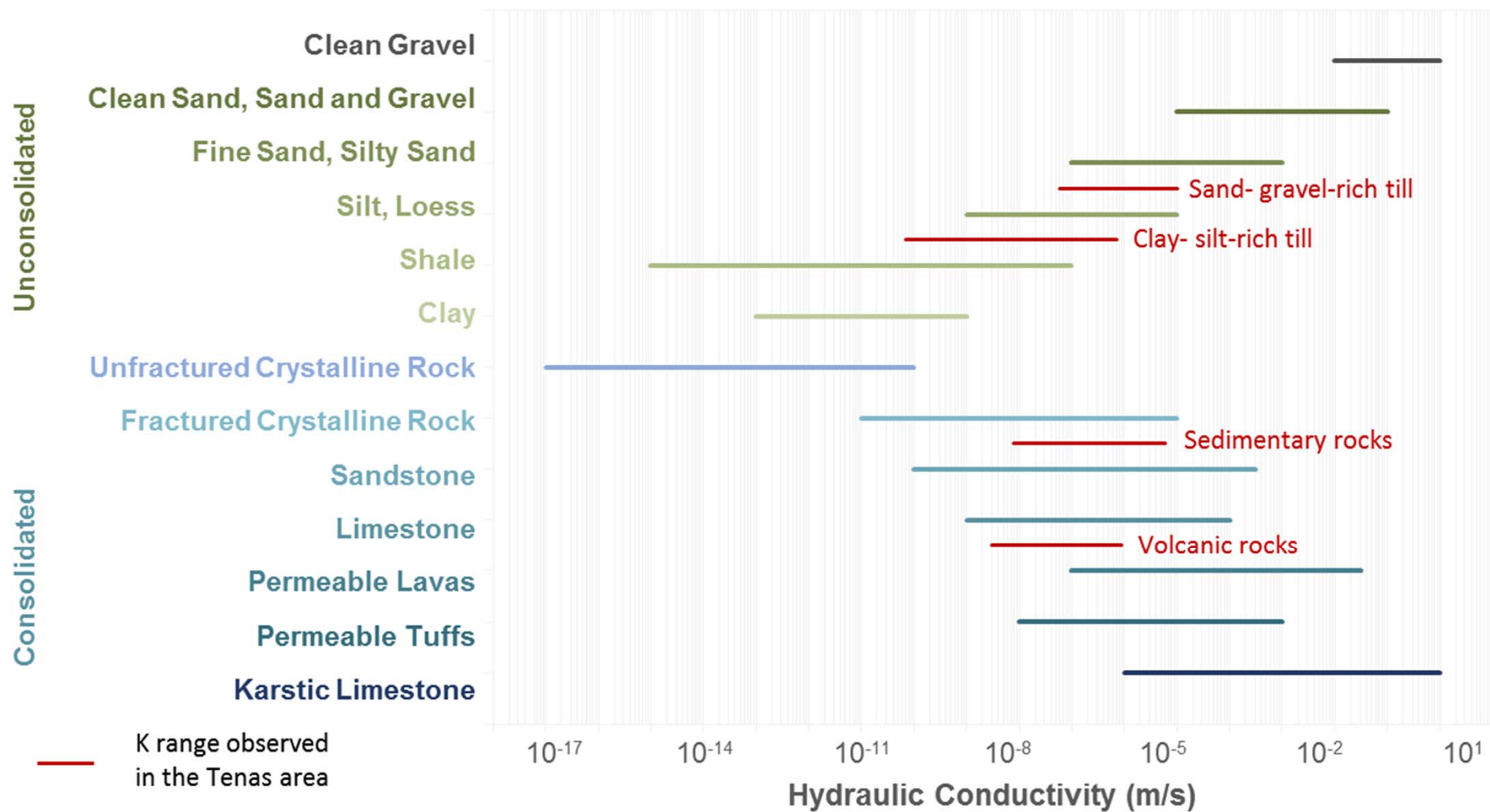
Source: 2017 to 2019 Baseline Report, March 2020. Project #0403488. Cassiar geosciences and ERM (2020)

Notes:

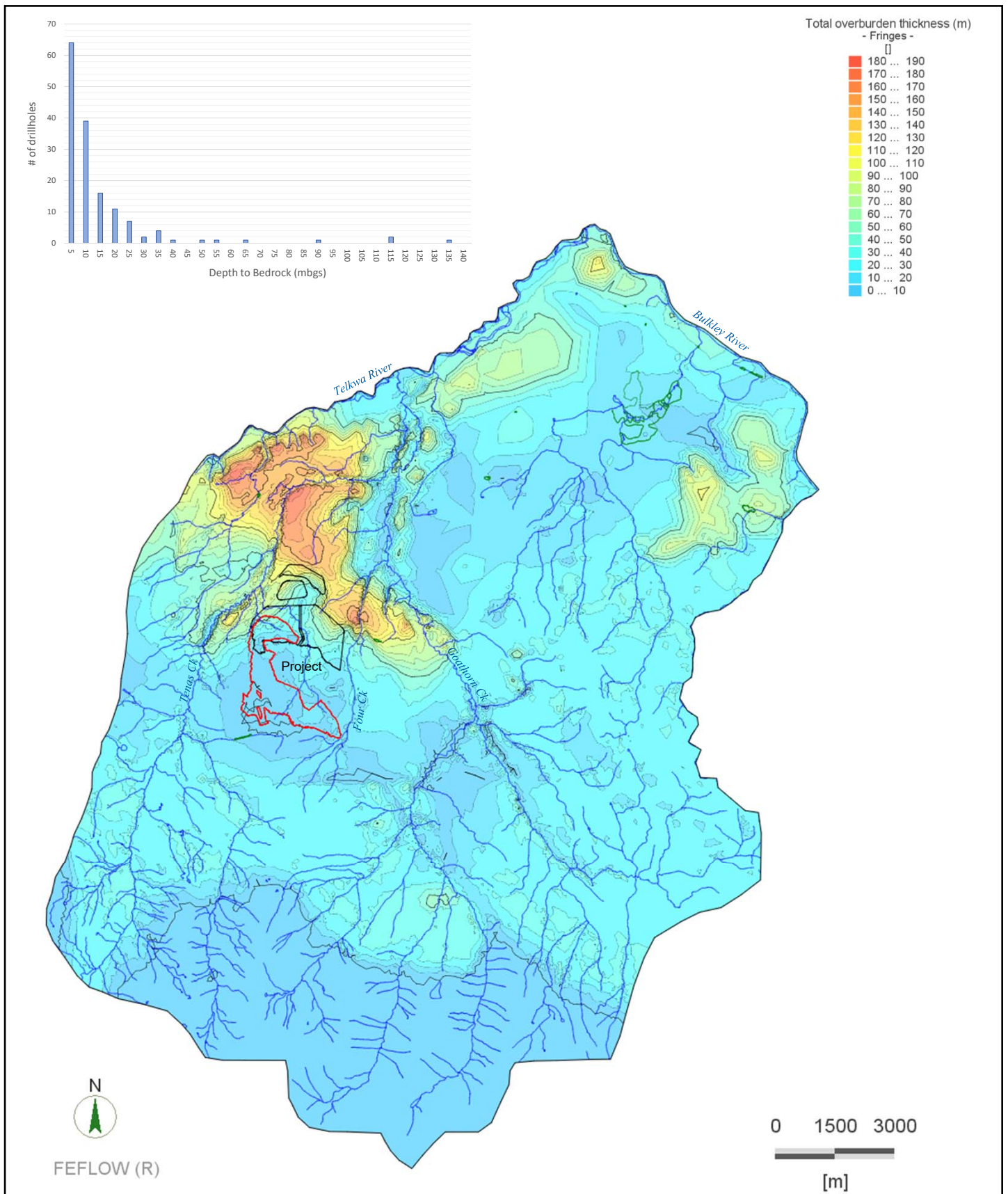
- ¹ Data from October 1995, September and October 1996, November 2016, September 2017, September 2018, and November 2019.
- ² Date from January 2018, March/April 2018, January 2019, and March/April 2019.
- ³ Data from August 1997, August 2017, June 2018, June 2019, and August 2019.

		Groundwater Technical Report		
		Piper plots of the groundwater quality at Project wells, and residential wells		
Job No: 1CT027.004 Filename: Fig35_GWQ diagram.pptx	Tenas Project	Date: Nov 2020	Approved: GF	Figure: 35

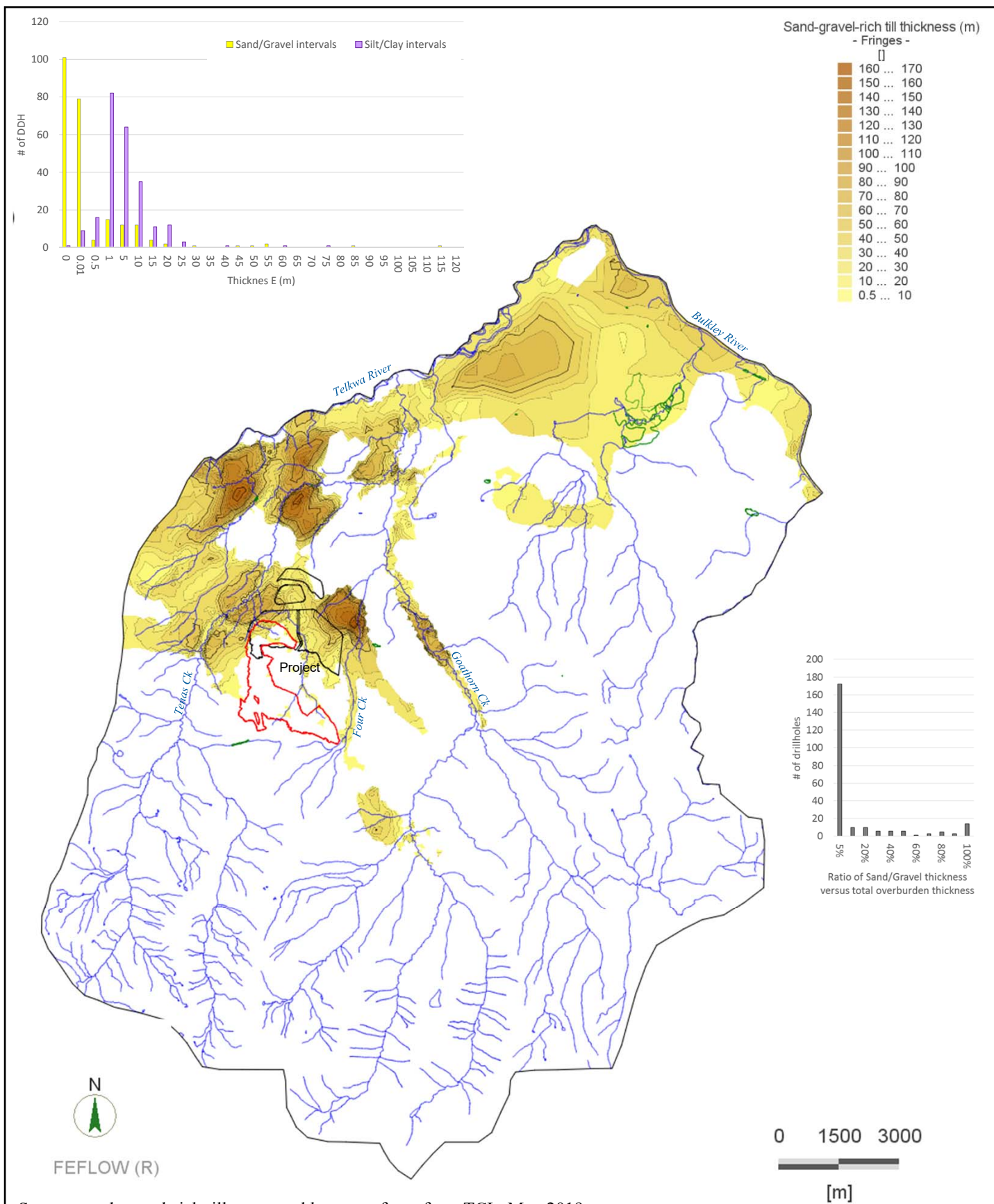




Source K range: Beale G, and J Reed. 2013. Guidelines for evaluating water in pit slope stability. CSIRO Publishing, Collingwood, Australia. 600 p.



		Groundwater Technical Report		
		Total modelled thickness of the overburden		
Job No: 1CT027.004	Tenas Project	Date: Dec 2020	Approved: GF	Figure: 38
Filename: Fig38_ThckOVb.pptx				



Source: sand-gravel-rich till upper and lower surfaces from TCL, May 2019

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Groundwater Technical Report

**Modelled thickness
of the sand-gravel-rich till**

Job No: 1CT027.004
Filename: Fig39_ThckSdGvl.pptx

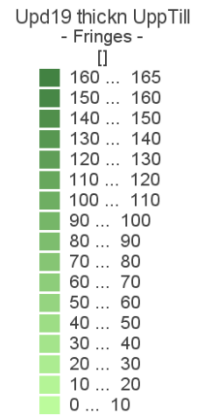
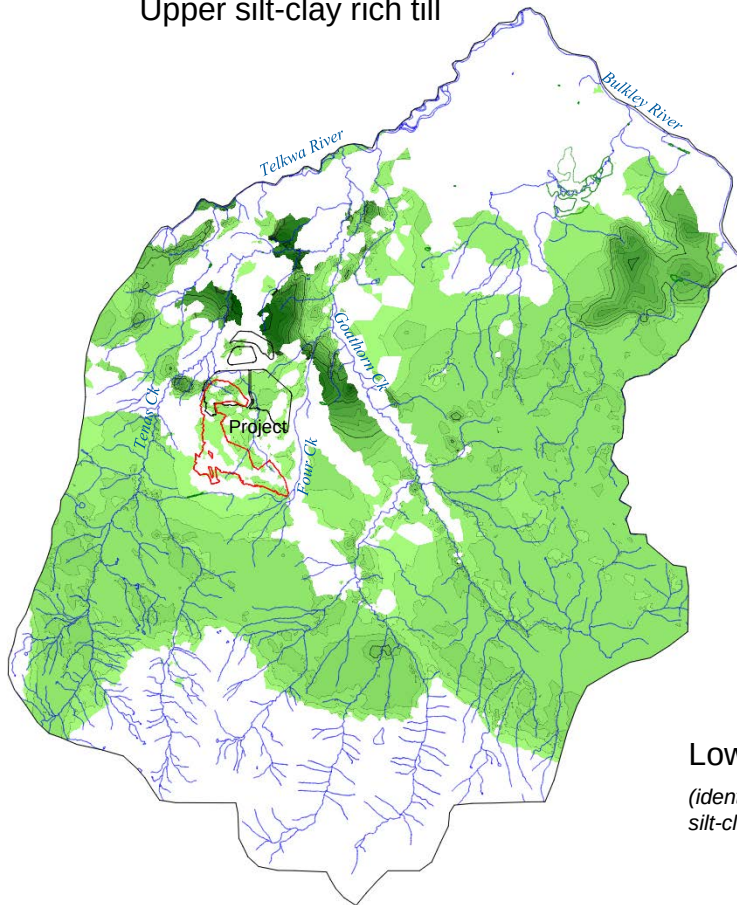
Tenas Project

Date:
Dec 2020

Approved:
GF

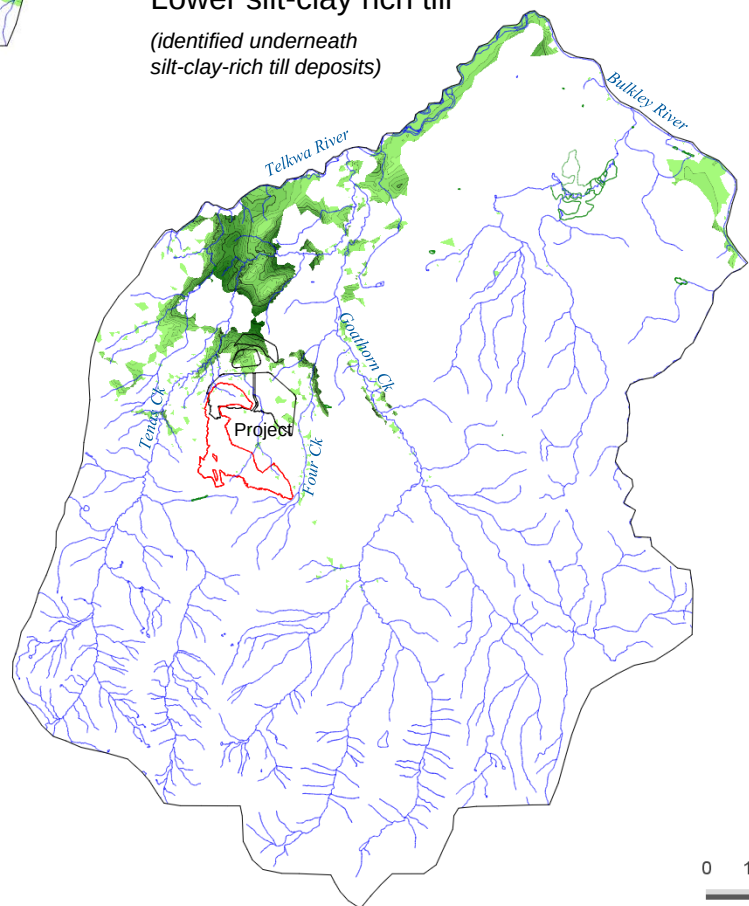
Figure: **39**

Upper silt-clay rich till



Lower silt-clay rich till

(identified underneath
silt-clay-rich till deposits)



FEFLOW (R)

0 1500 3000
[m]

Source: silt-clay-rich till upper and lower surfaces from TCL, May 2019

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Groundwater Technical Report

**Modelled thickness
of the silt-clay-rich till**

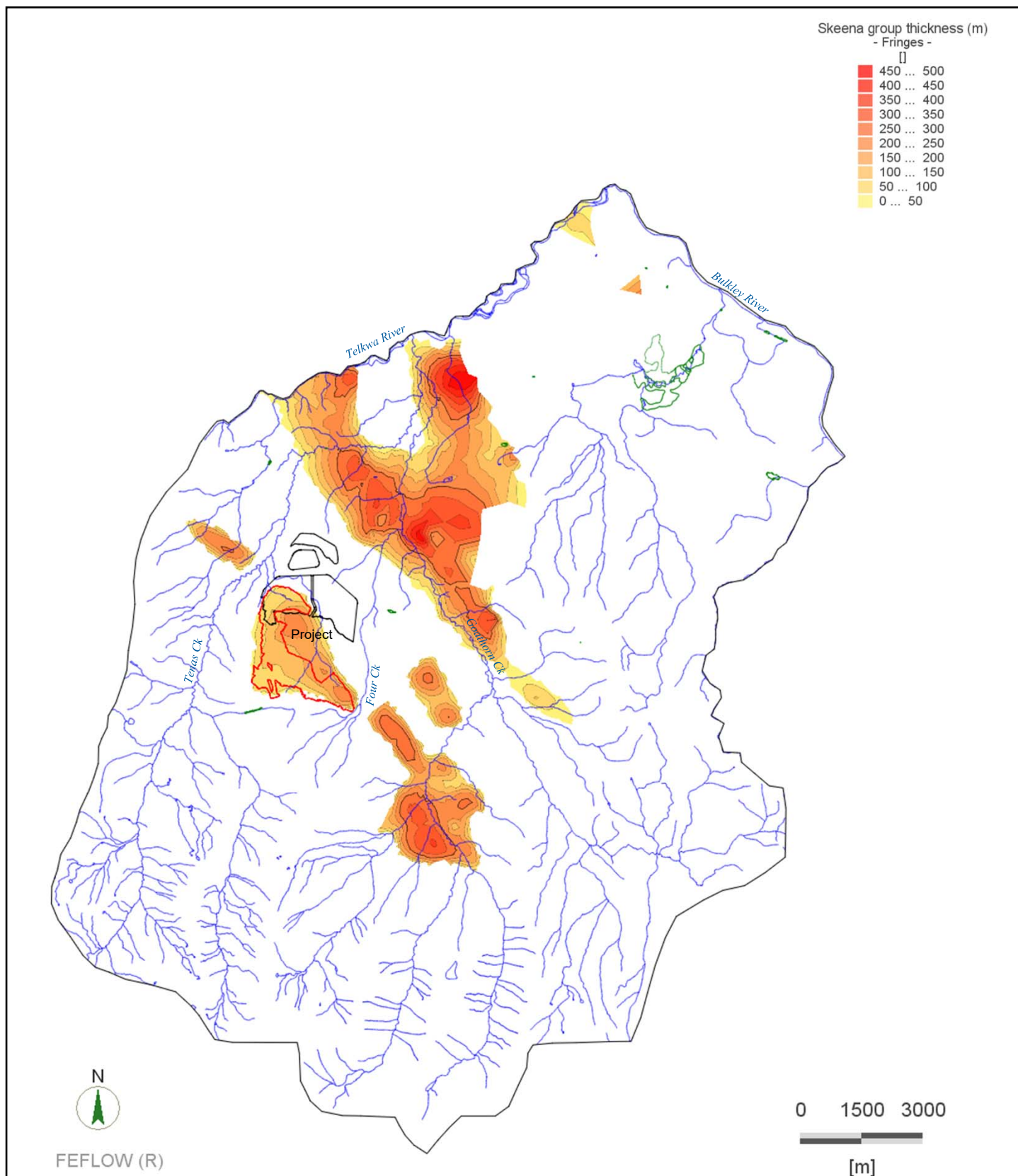
Job No: 1CT027.004
Filename: Fig40_ThckOVb.pptx

Tenas Project

Date:
Dec 2020

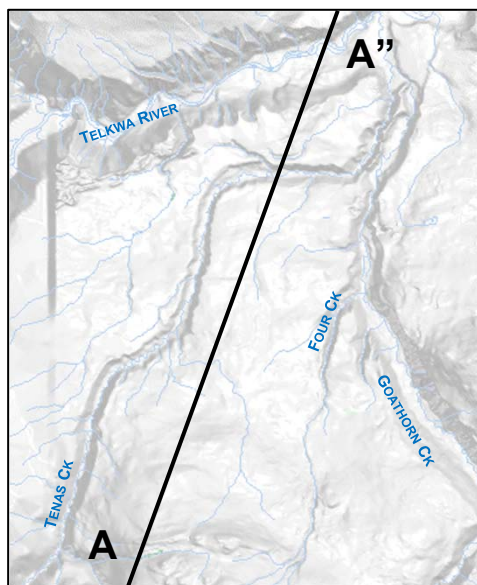
Approved:
GF

Figure: **40**



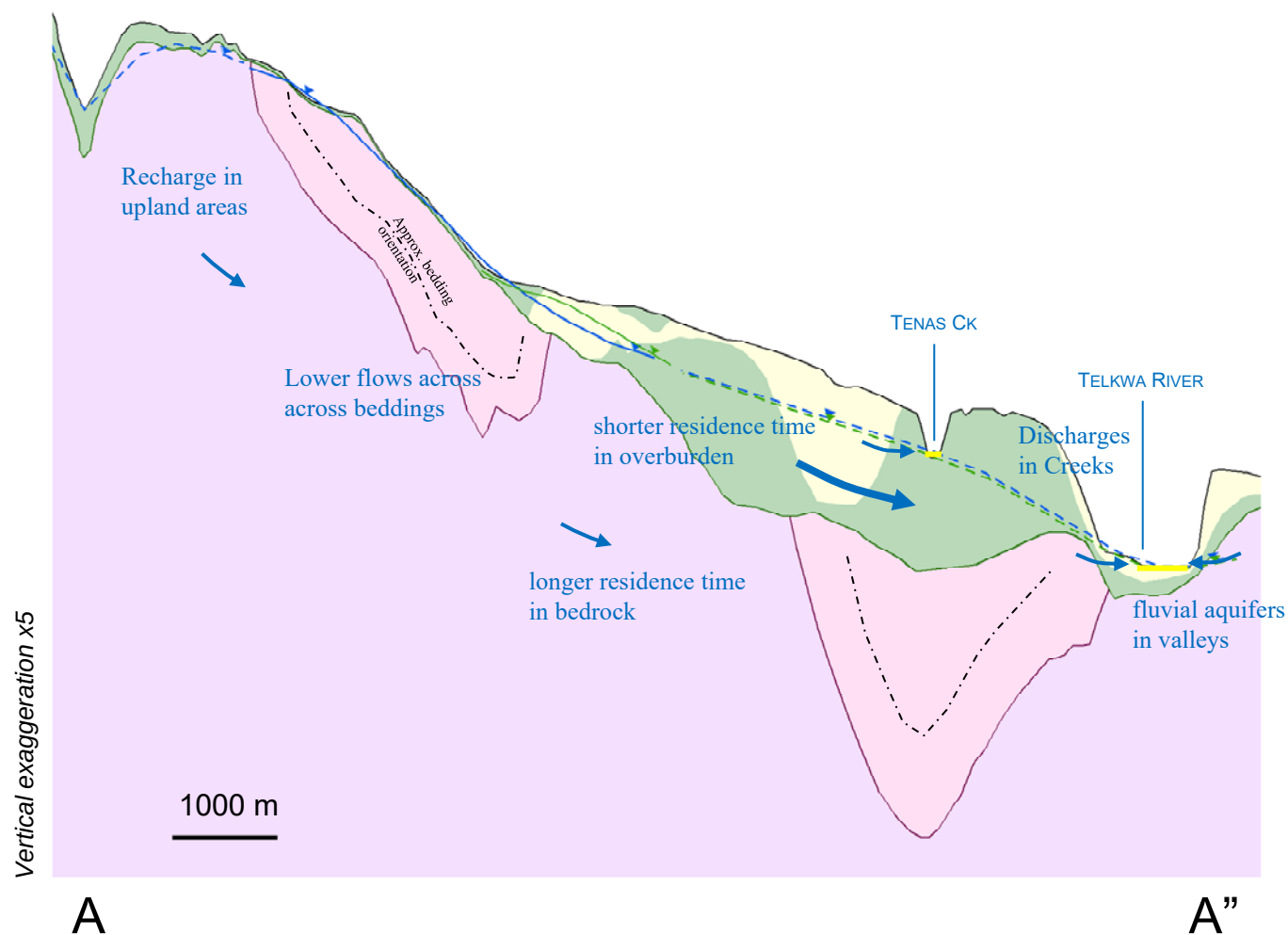
Source: Interpolation based on geological maps, digitized plan view geological maps and vertical cross sections from TCL and MEMPR 1991

	 TELKWA COAL LIMITED	Groundwater Technical Report		
		Modelled thickness of the sedimentary rocks (Skeena group)		
Job No: 1CT027.004	Tenas Project	Date: Dec 2020	Approved: GF	Figure: 41
Filename: Fig41_ThckSKN.pptx				



Legend

- Mine level (Control Pond, MPs or Pit Lakes)
- Groundwater table associated with OVB (Interpolated)
- Groundwater table associated with BDR (Interpolated)
- Average groundwater table (extrapolated)
- Non PAG backfill
- Rock cover
- PAG
- MP Liner
- MP Dam
- Butress
- Overburden: clay-silt-rich till
- Overburden: sand-gravel-rich till
- Skeena sedimentary rocks
- Volcanic rocks



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Job No: 1CT027.004
Filename: Fig42to51_ConceptualCrossX.pptx

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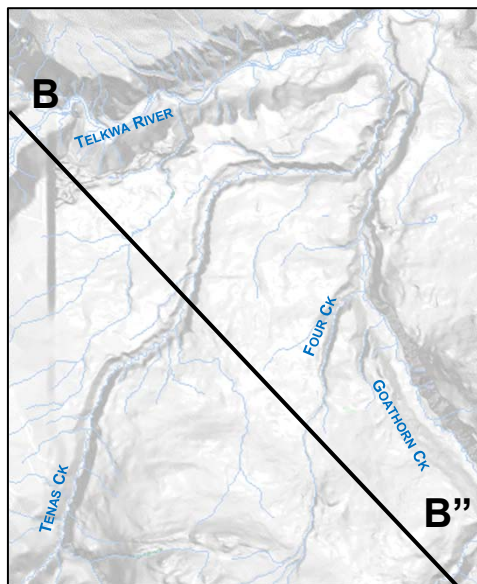
Groundwater Technical Report

**Conceptual Cross Section AA''
Baseline**

Date: Dec.2020

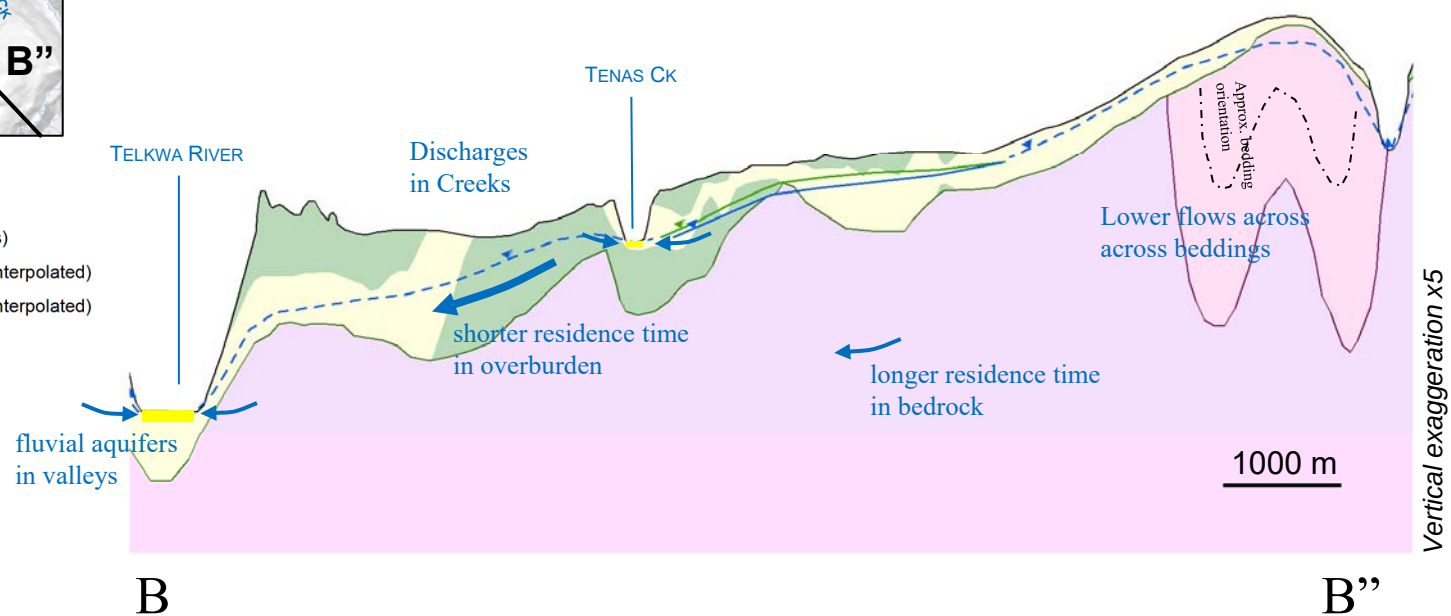
Approved: GF

Figure: **42**



Legend

- Mine level (Control Pond, MPs or Pit Lakes)
- Groundwater table associated with OVB (Interpolated)
- Groundwater table associated with BDR (Interpolated)
- Average groundwater table (extrapolated)
- Non PAG backfill
- Rock cover
- PAG
- MP Liner
- MP Dam
- Butress
- Overburden: clay-silt-rich till
- Overburden: sand-gravel-rich till
- Skeena sedimentary rocks
- Volcanic rocks



Groundwater Technical Report

Conceptual Cross Section BB'' Baseline

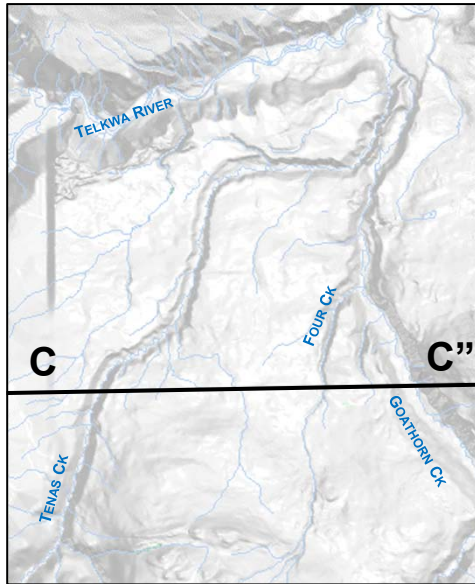
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Filename: Fig42to51_ConceptualCrossX.pptx

Tenas Project

Date:
Dec.2020

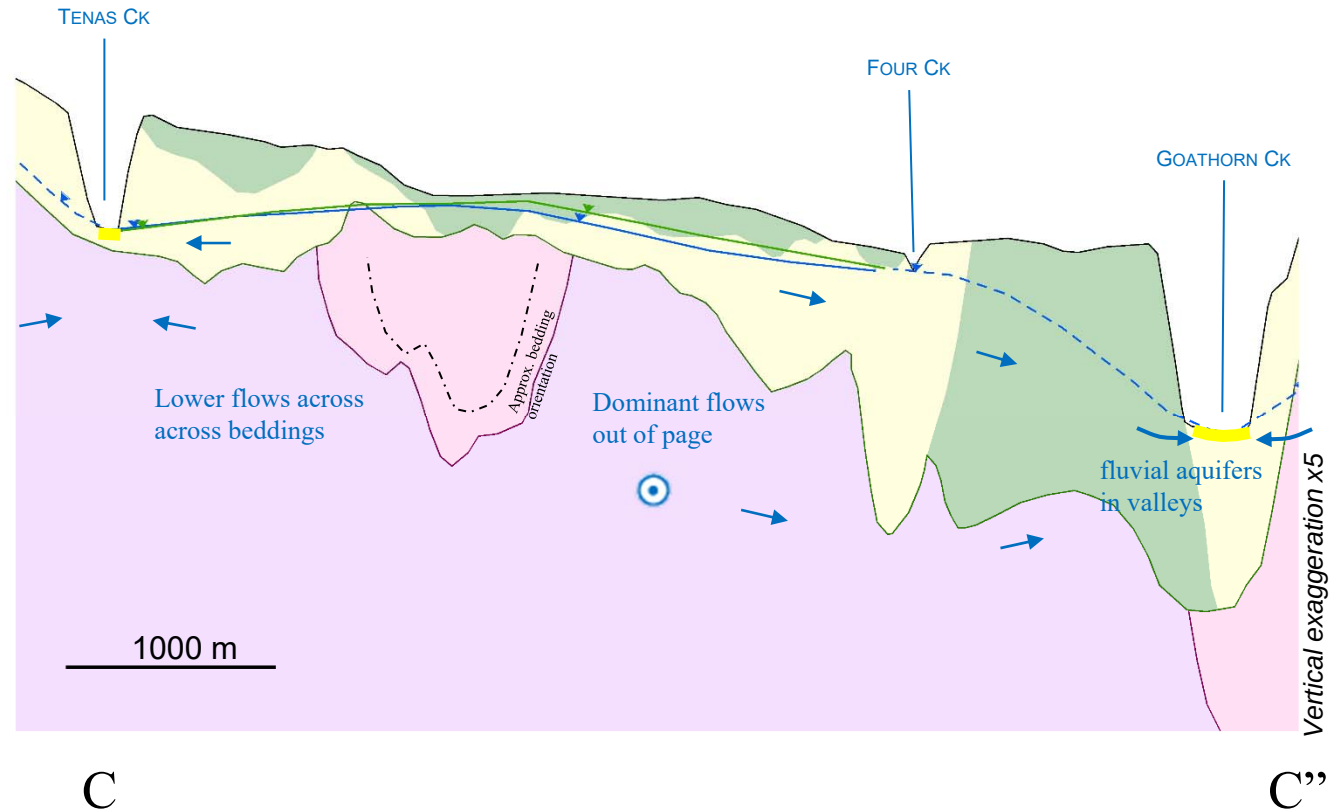
Approved:
GF

Figure: **43**

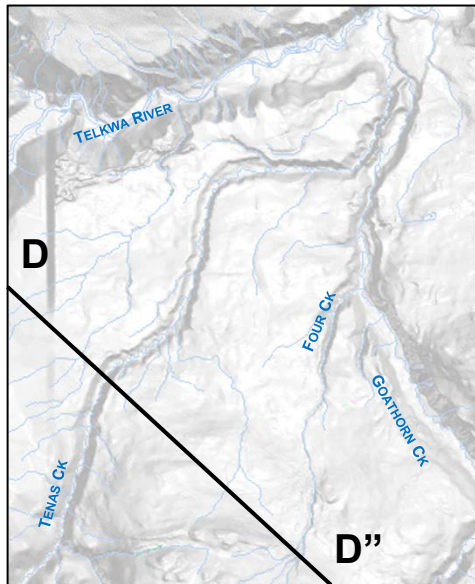


Legend

- Mine level (Control Pond, MPs or Pit Lakes)
- Groundwater table associated with OVB (Interpolated)
- Groundwater table associated with BDR (Interpolated)
- Average groundwater table (extrapolated)
- Non PAG backfill
- Rock cover
- PAG
- MP Liner
- MP Dam
- Butress
- Overburden: clay-silt-rich till
- Overburden: sand-gravel-rich till
- Skeena sedimentary rocks
- Volcanic rocks

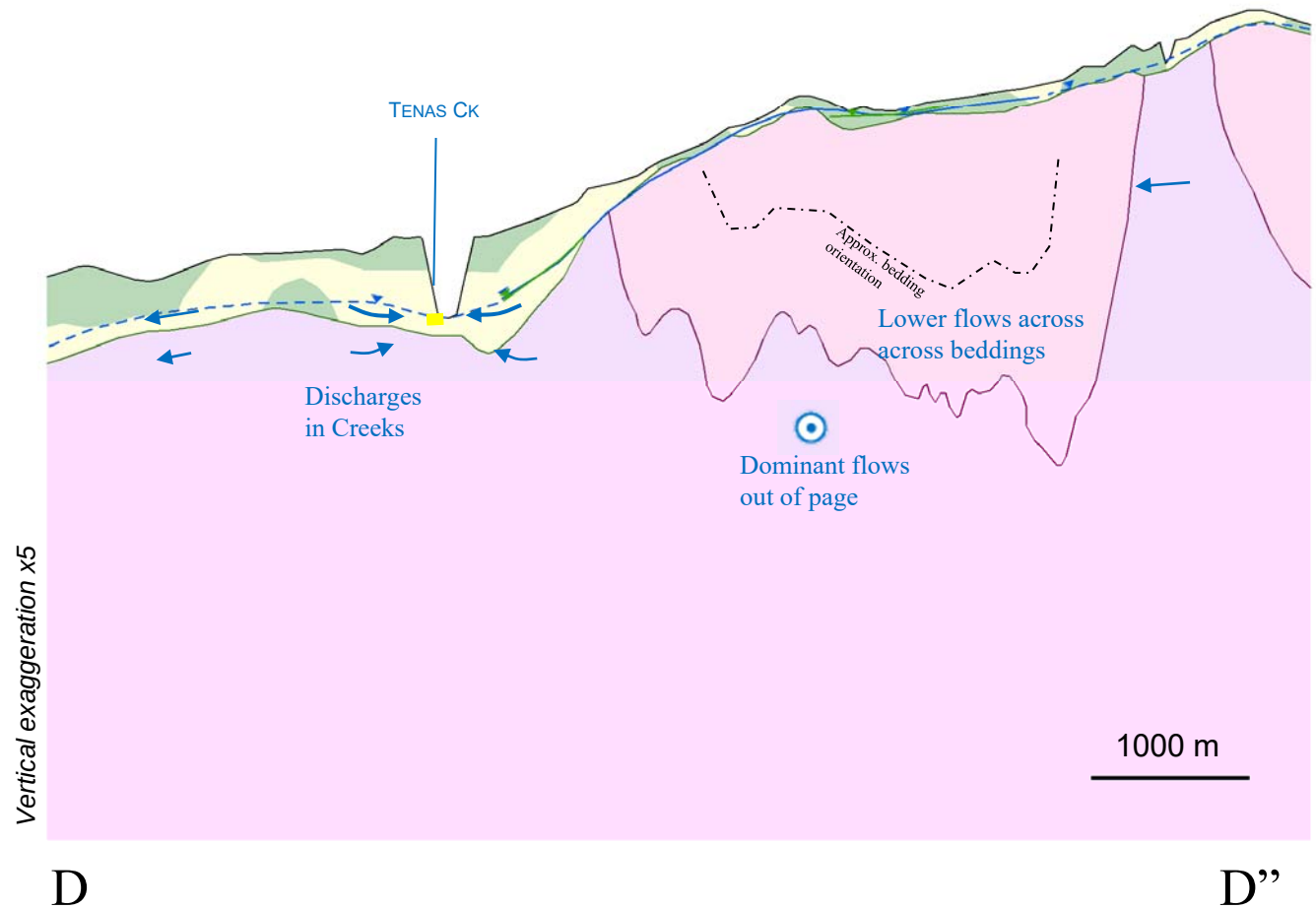


		Groundwater Technical Report		
		Conceptual Cross Section CC'' Baseline		
Job No: 1CT027.004 Filename: Fig42to51_ConceptualCrossX.pptx	Tenas Project	Date: Dec.2020	Approved: GF	Figure: 44

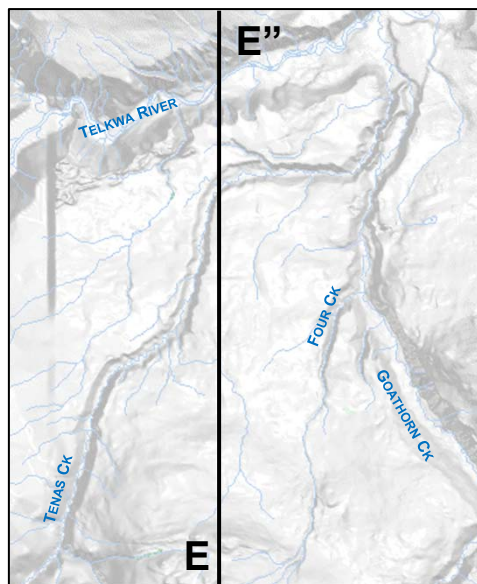


Legend

- Mine level (Control Pond, MPs or Pit Lakes)
- Groundwater table associated with OVB (Interpolated)
- Groundwater table associated with BDR (Interpolated)
- Average groundwater table (extrapolated)
- Non PAG backfill
- Rock cover
- PAG
- MP Liner
- MP Dam
- Butress
- Overburden: clay-silt-rich till
- Overburden: sand-gravel-rich till
- Skeena sedimentary rocks
- Volcanic rocks

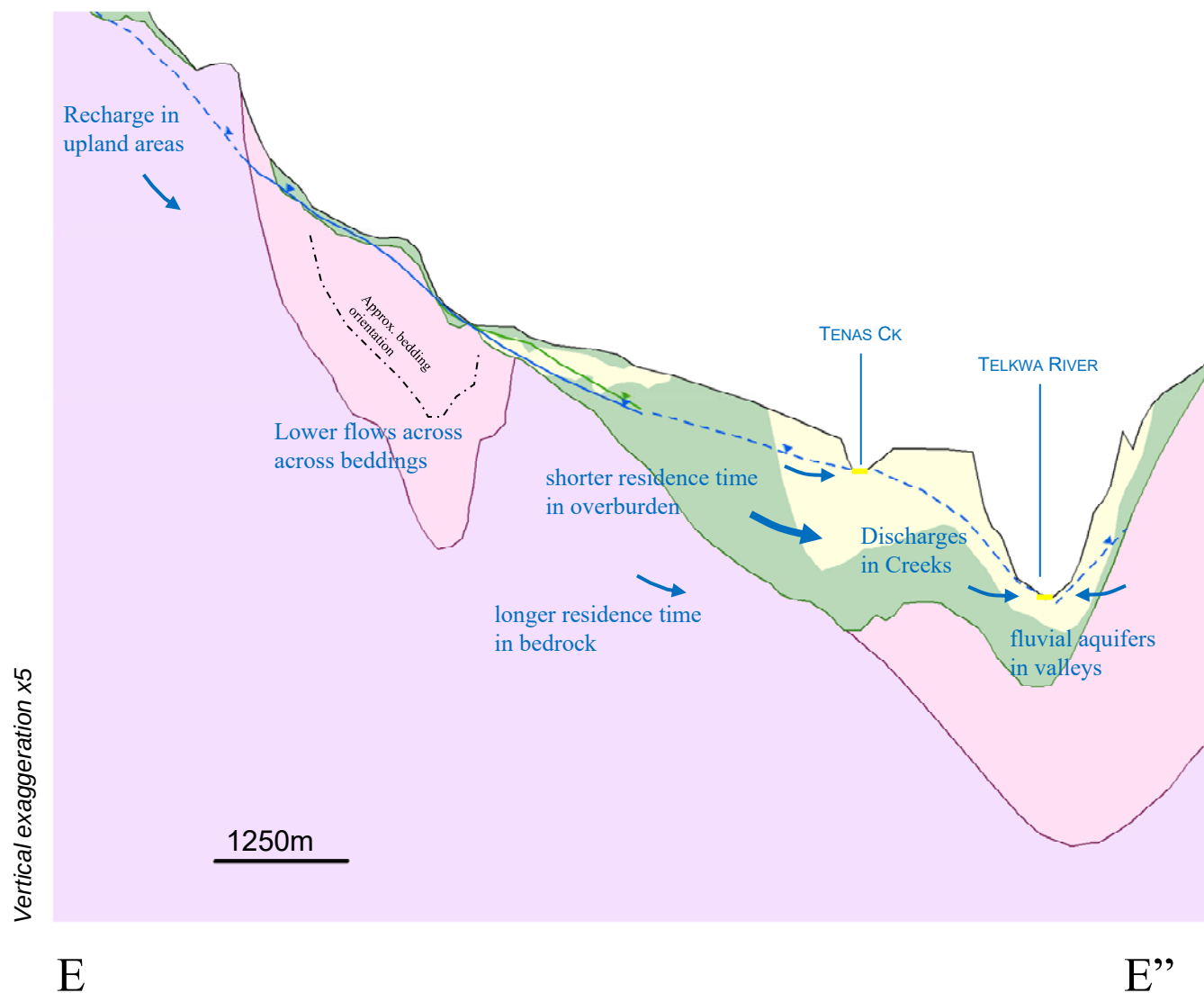


		Groundwater Technical Report		
		Conceptual Cross Section DD' Baseline		
Job No: 1CT027.004 Filename: Fig42to51_ConceptualCrossX.pptx	Tenas Project	Date: Dec.2020	Approved: GF	Figure: 45

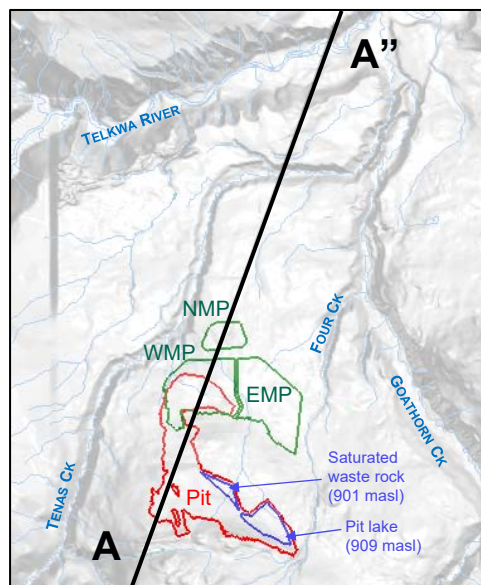


Legend

- Mine level (Control Pond, MPs or Pit Lakes)
- Groundwater table associated with OVB (Interpolated)
- Groundwater table associated with BDR (Interpolated)
- Average groundwater table (extrapolated)
- Non PAG backfill
- Rock cover
- PAG
- MP Liner
- MP Dam
- Butress
- Overburden: clay-silt-rich till
- Overburden: sand-gravel-rich till
- Skeena sedimentary rocks
- Volcanic rocks

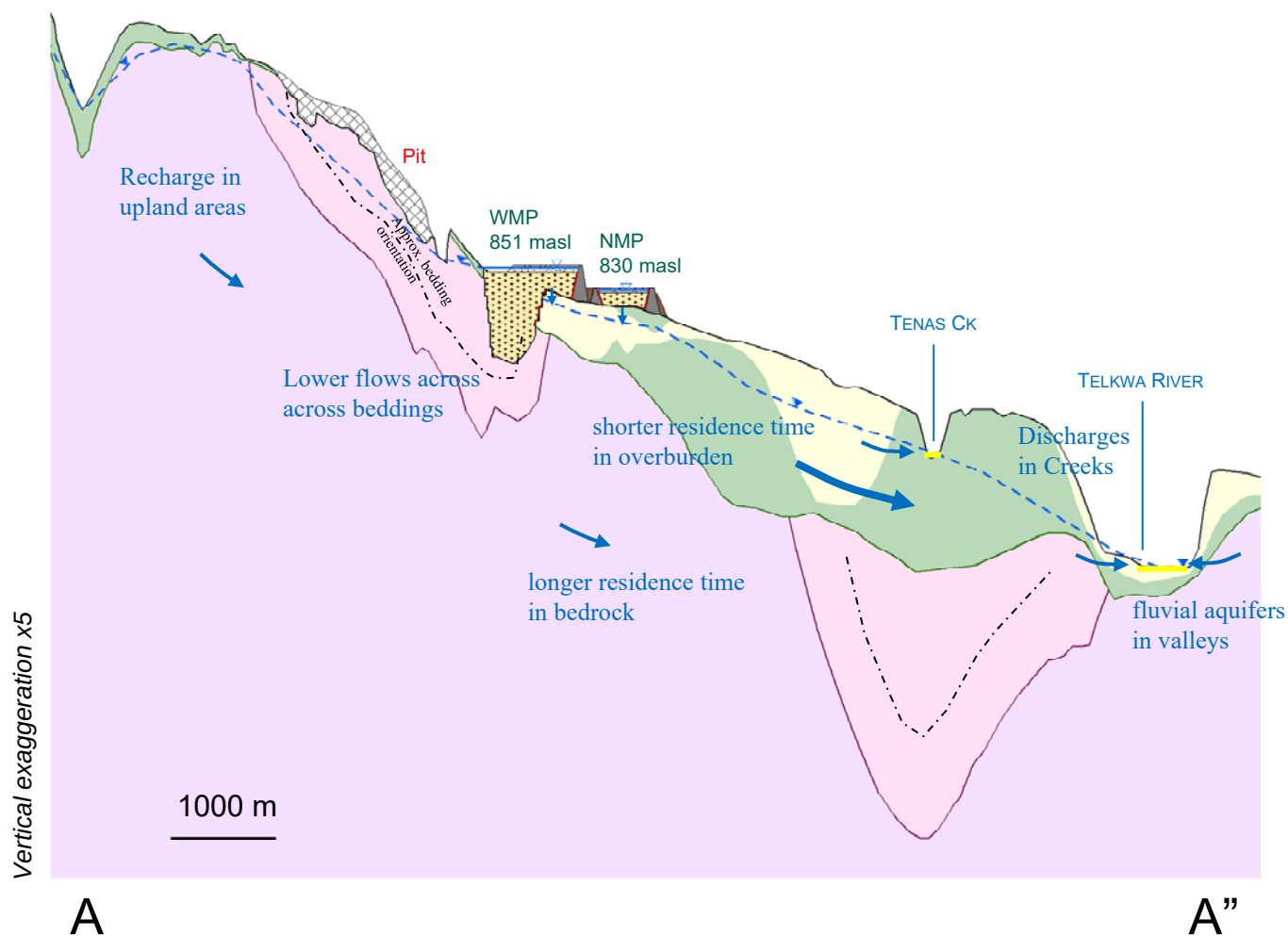


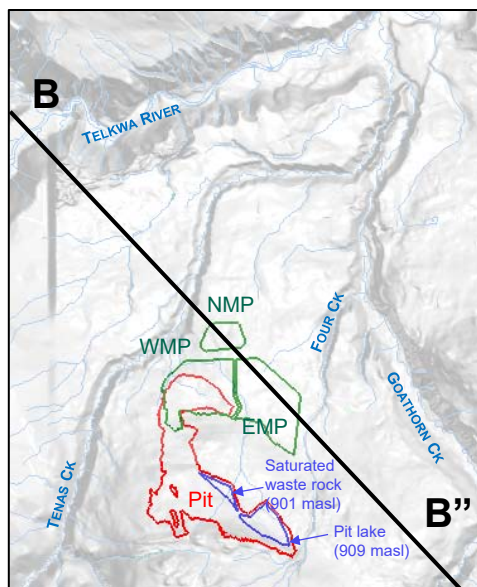
		Groundwater Technical Report		
		Conceptual Cross Section EE'' Baseline		
Job No: 1CT027.004	Tenas Project	Date: Dec.2020	Approved: GF	Figure: 46
Filename: Fig42to51_ConceptualCrossX.pptx				



Legend

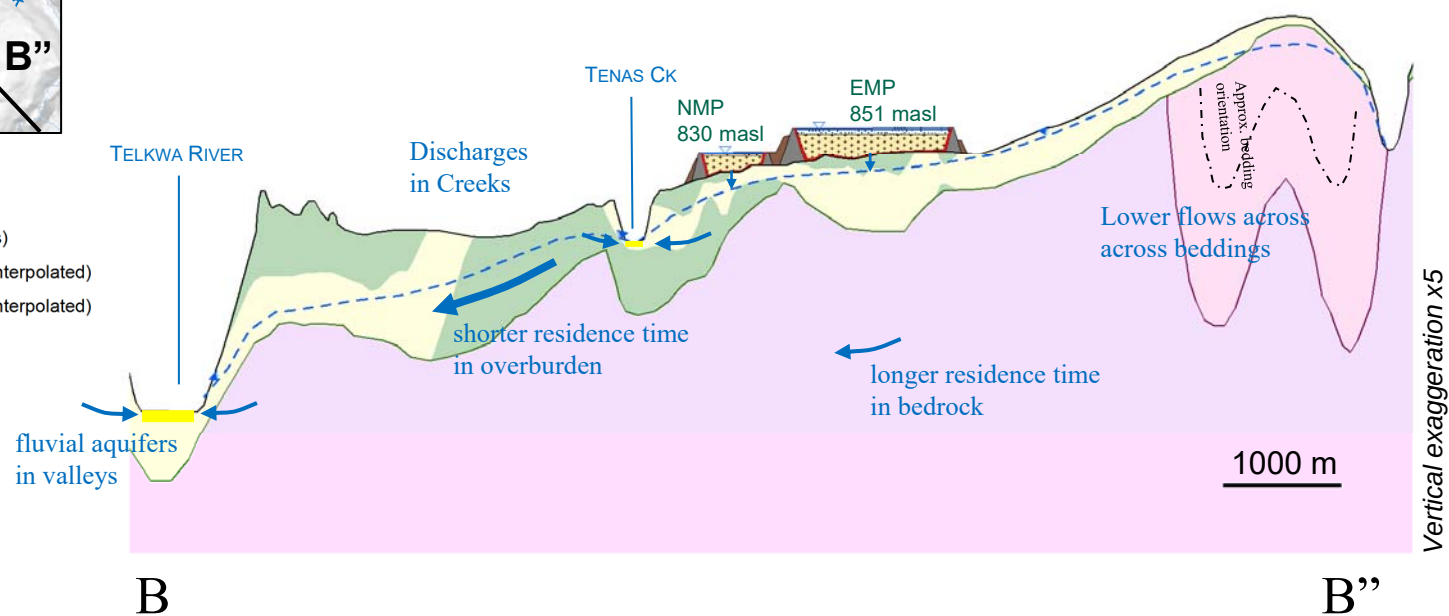
- Mine level (Control Pond, MPs or Pit Lakes)
- Groundwater table associated with OVB (Interpolated)
- Groundwater table associated with BDR (Interpolated)
- Average groundwater table (extrapolated)
- Non PAG backfill
- Rock cover
- PAG
- MP Liner
- MP Dam
- Butress
- Overburden: clay-silt-rich till
- Overburden: sand-gravel-rich till
- Skeena sedimentary rocks
- Volcanic rocks





Legend

- Mine level (Control Pond, MPs or Pit Lakes)
- Groundwater table associated with OVB (Interpolated)
- Groundwater table associated with BDR (Interpolated)
- Average groundwater table (extrapolated)
- Non PAG backfill
- Rock cover
- PAG
- MP Liner
- MP Dam
- Butress
- Overburden: clay-silt-rich till
- Overburden: sand-gravel-rich till
- Skeena sedimentary rocks
- Volcanic rocks



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Job No: 1CT027.004
Filename: Fig42to51_ConceptualCrossX.pptx

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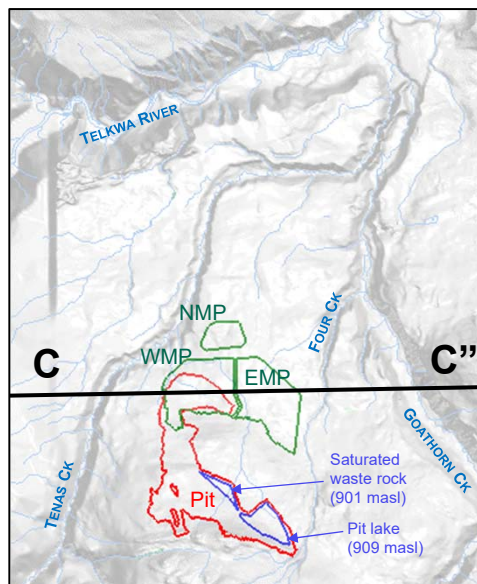
Groundwater Technical Report

Conceptual Cross Section BB''
Post closure

Date:
Dec.2020

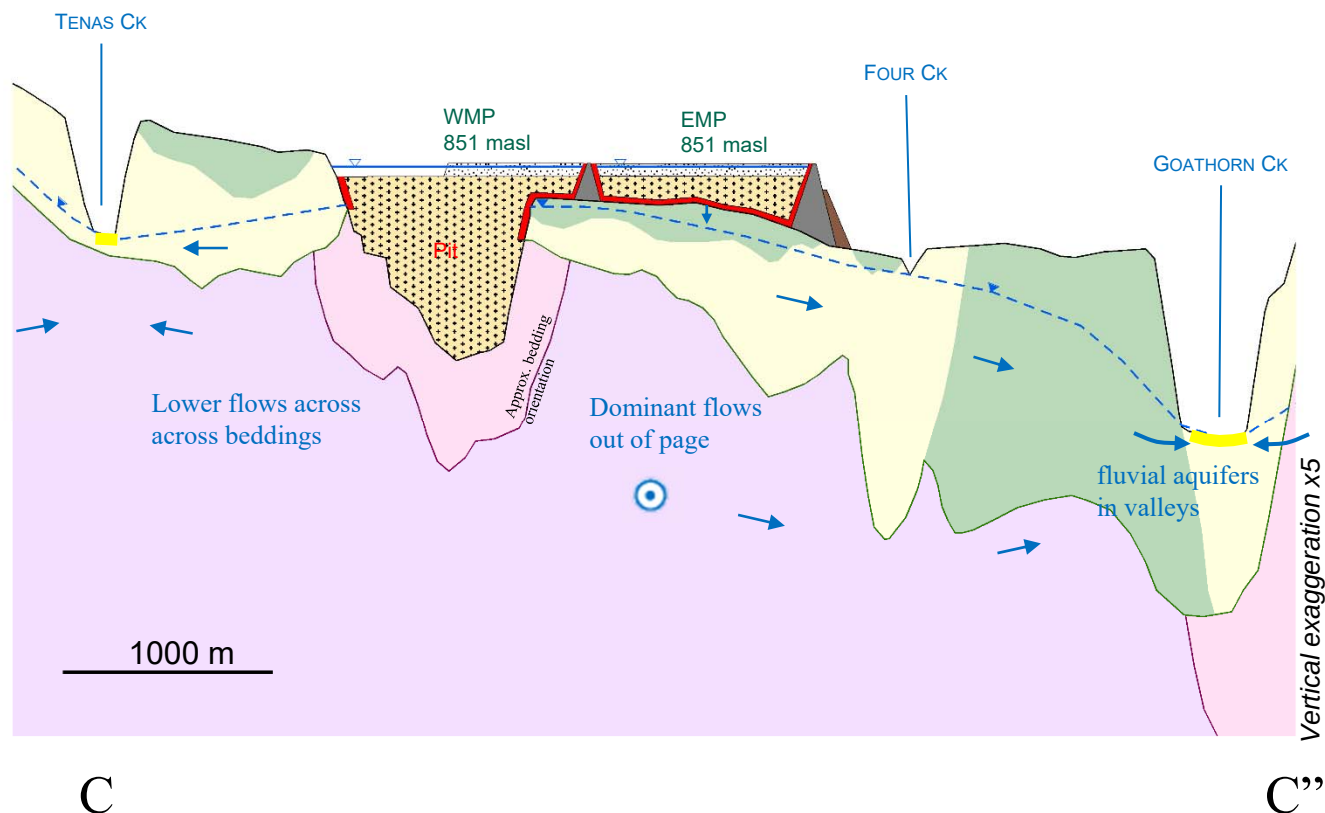
Approved:
GF

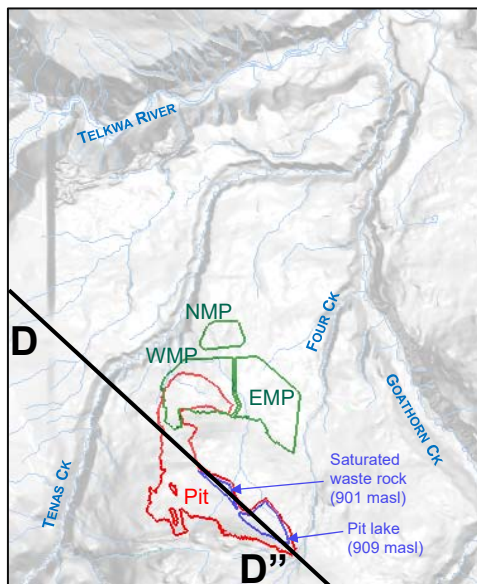
Figure: **48**



Legend

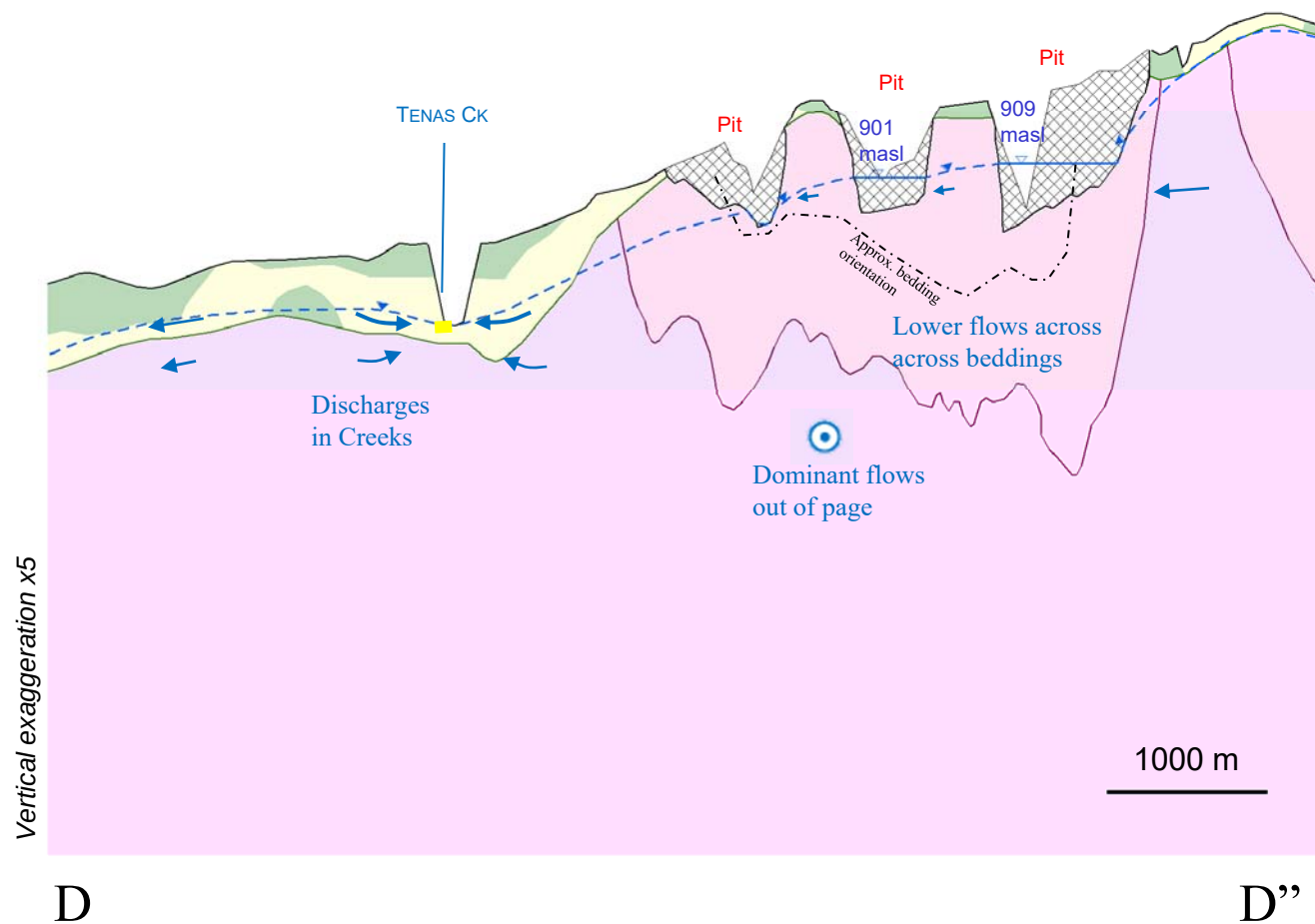
- Mine level (Control Pond, MPs or Pit Lakes)
- Groundwater table associated with OVB (Interpolated)
- Groundwater table associated with BDR (Interpolated)
- Average groundwater table (extrapolated)
- Non PAG backfill
- Rock cover
- PAG
- MP Liner
- MP Dam
- Butress
- Overburden: clay-silt-rich till
- Overburden: sand-gravel-rich till
- Skeena sedimentary rocks
- Volcanic rocks



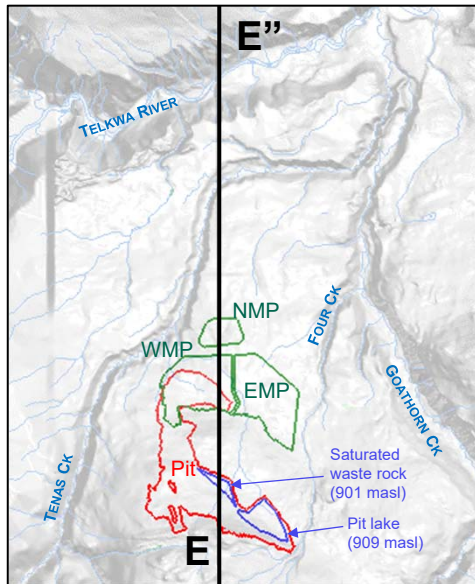


Legend

- Mine level (Control Pond, MPs or Pit Lakes)
- Groundwater table associated with OVB (Interpolated)
- Groundwater table associated with BDR (Interpolated)
- Average groundwater table (extrapolated)
- Non PAG backfill
- Rock cover
- PAG
- MP Liner
- MP Dam
- Butress
- Overburden: clay-silt-rich till
- Overburden: sand-gravel-rich till
- Skeena sedimentary rocks
- Volcanic rocks

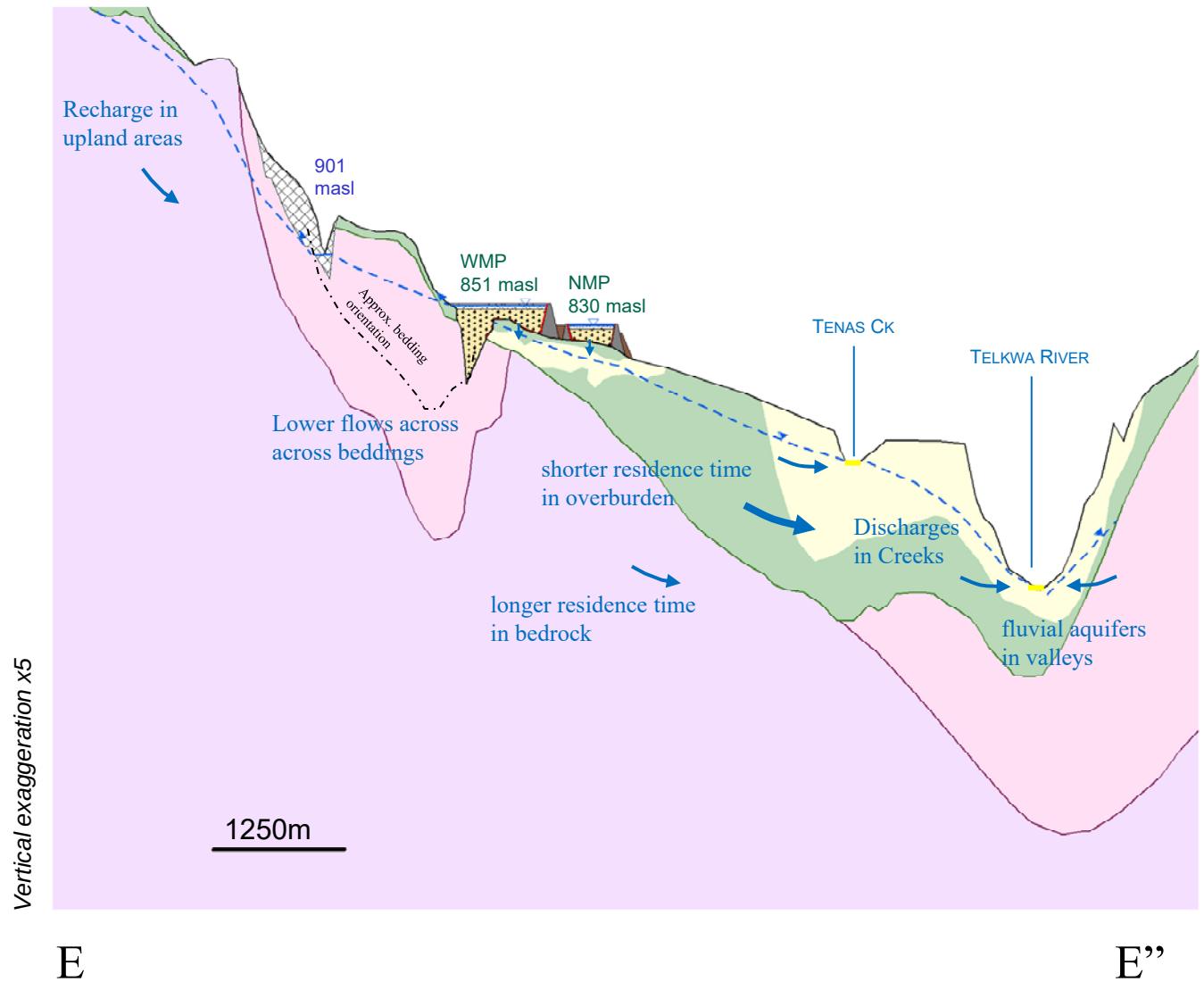


		Groundwater Technical Report		
		Conceptual Cross Section DD'' Post closure		
Job No: 1CT027.004 Filename: Fig42to51_ConceptualCrossX.pptx	Tenas Project	Date: Dec.2020	Approved: GF	Figure: 50

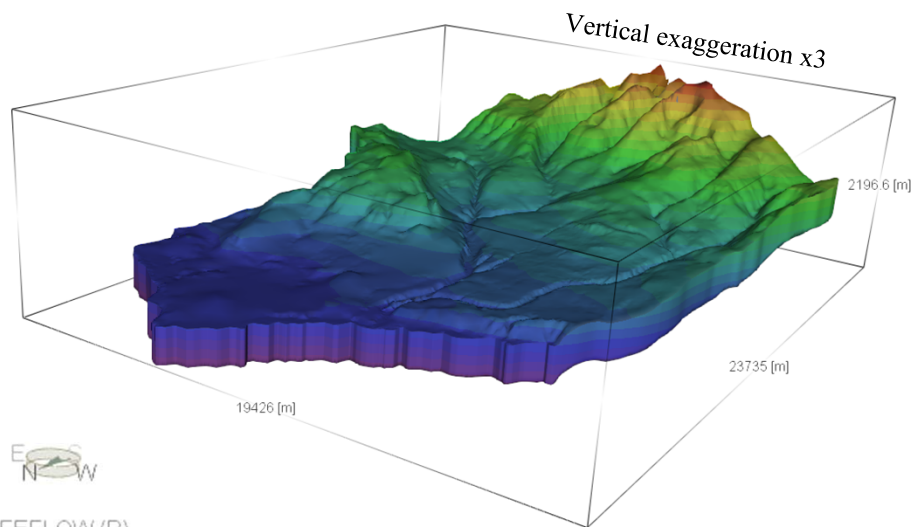
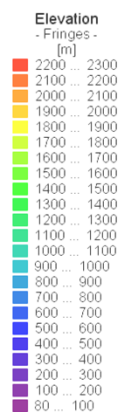
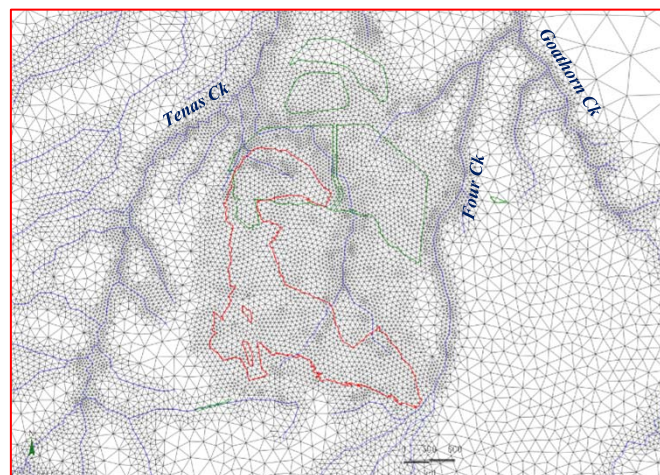


Legend

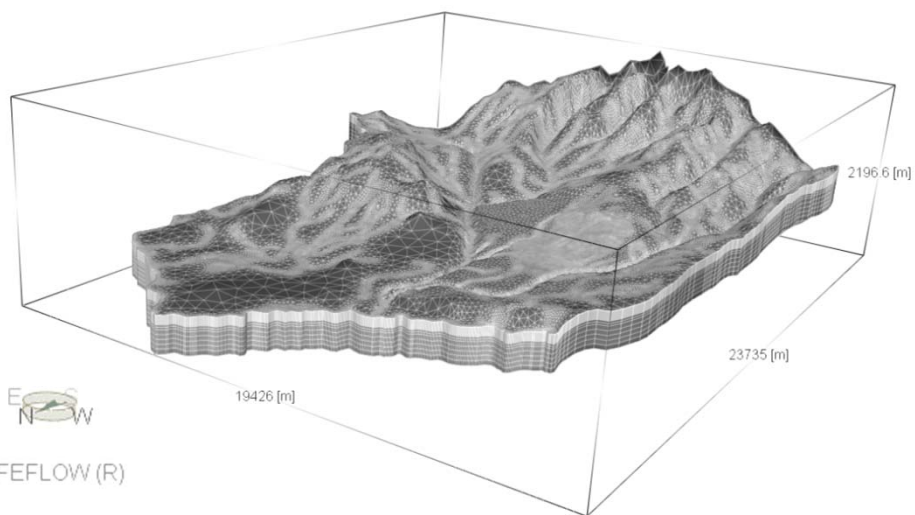
- Mine level (Control Pond, MPs or Pit Lakes)
- Groundwater table associated with OVB (Interpolated)
- Groundwater table associated with BDR (Interpolated)
- Average groundwater table (extrapolated)
- Non PAG backfill
- Rock cover
- PAG
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- MP Dam
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- Overburden: clay-silt-rich till
- Overburden: sand-gravel-rich till
- Skeena sedimentary rocks
- Volcanic rocks



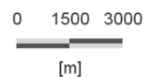
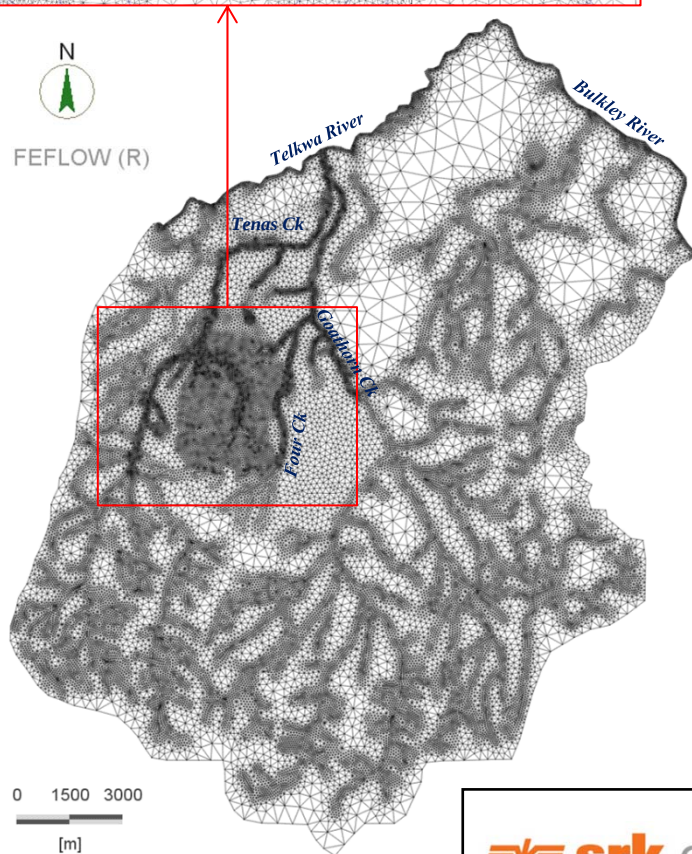
		Groundwater Technical Report		
		Conceptual Cross Section EE'' Post closure		
Job No: 1CT027.004 Filename: Fig42to51_ConceptualCrossX.pptx	Tenas Project	Date: Dec.2020	Approved: GF	Figure: 51



FEFLOW (R)



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srk consulting

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Groundwater Technical Report

**Domain and mesh
of the 3D numerical model**

Job No: 1CT027.004
Filename: Fig52_Domain and mesh.pptx

Tenas Project

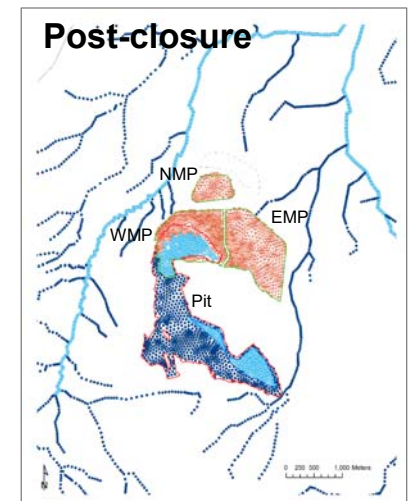
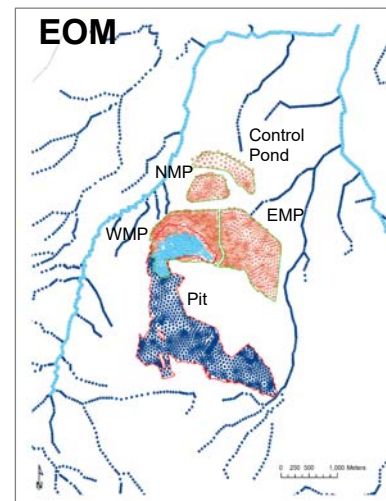
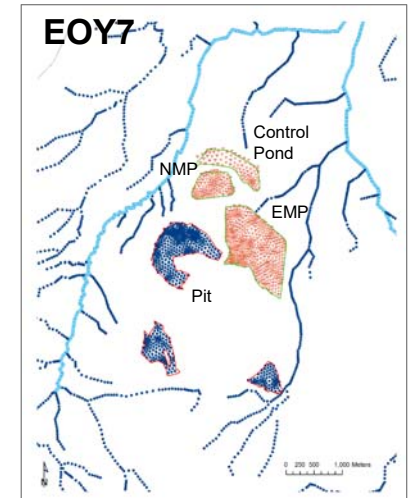
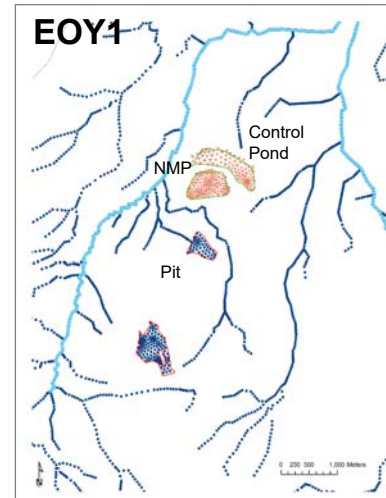
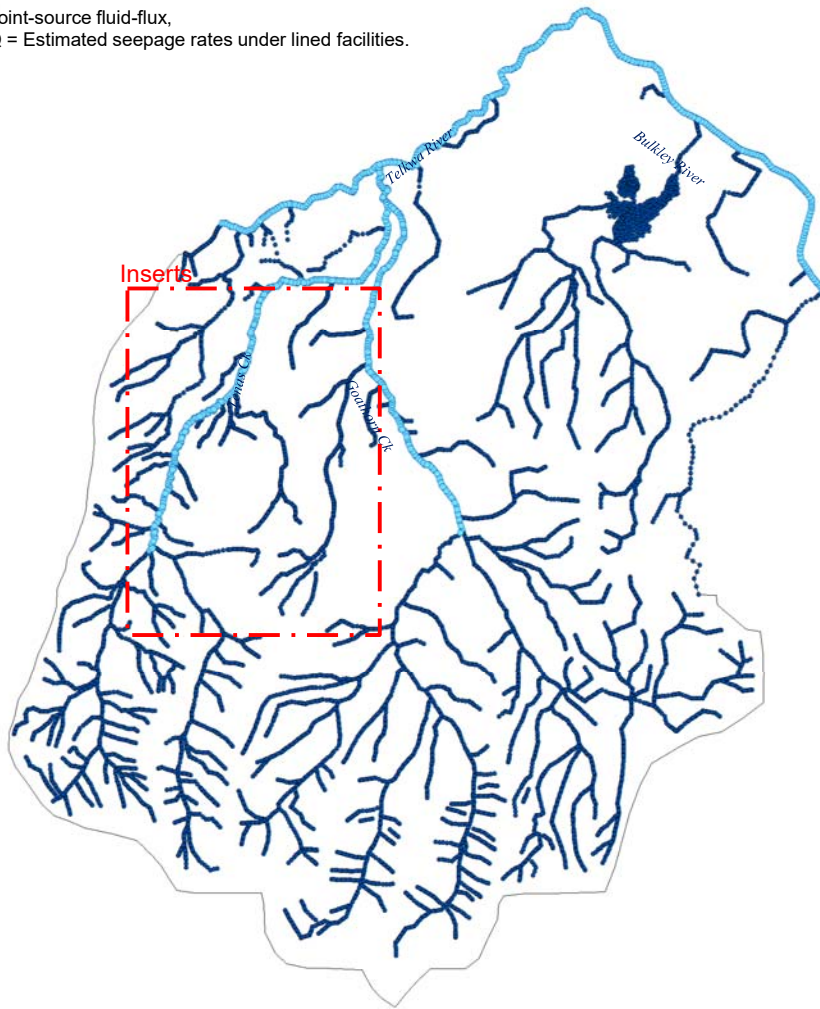
Date:
Nov 2020

Approved:
GF

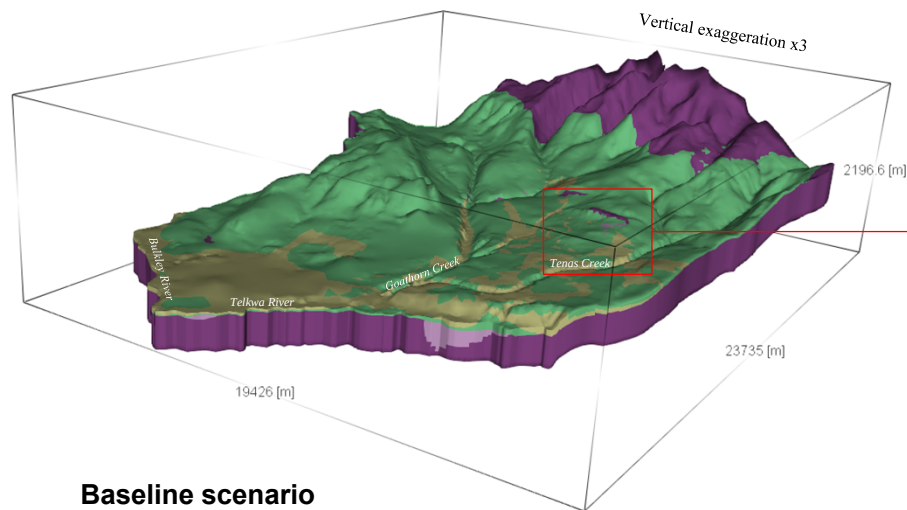
Figure: **52**

Legend

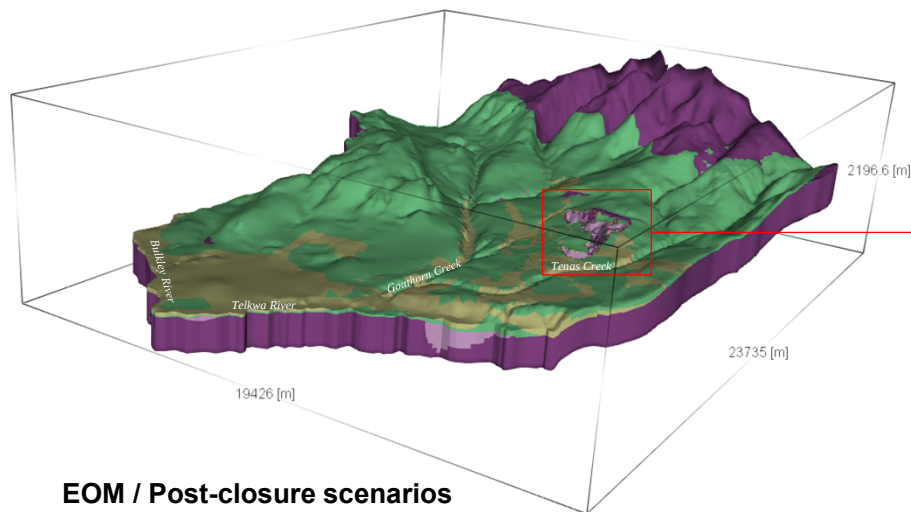
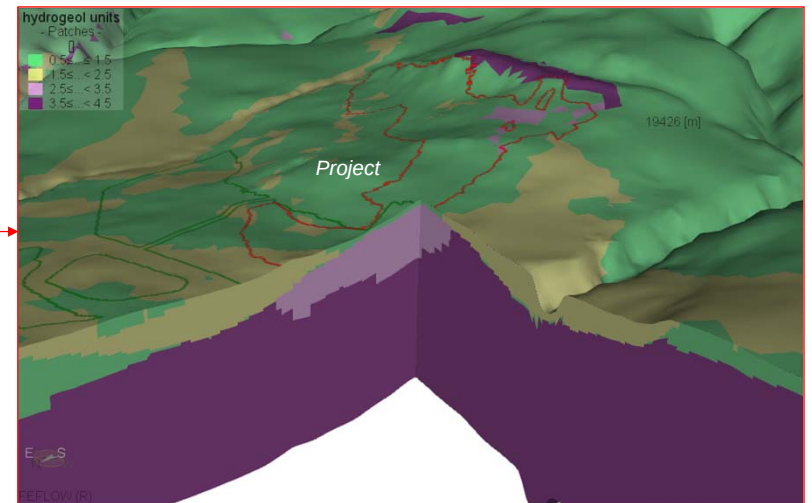
- Dirichlet (constant head),
H = topo elevation, or water levels at unlined WMP, in-pit saturated waste rock / lake.
- Dirichlet (constant head) with flux constraint (seepage),
H = Topo elevation, or pit elevation (ie., pit walls).
- ▼ point-source fluid-flux,
Q = Estimated seepage rates under lined facilities.



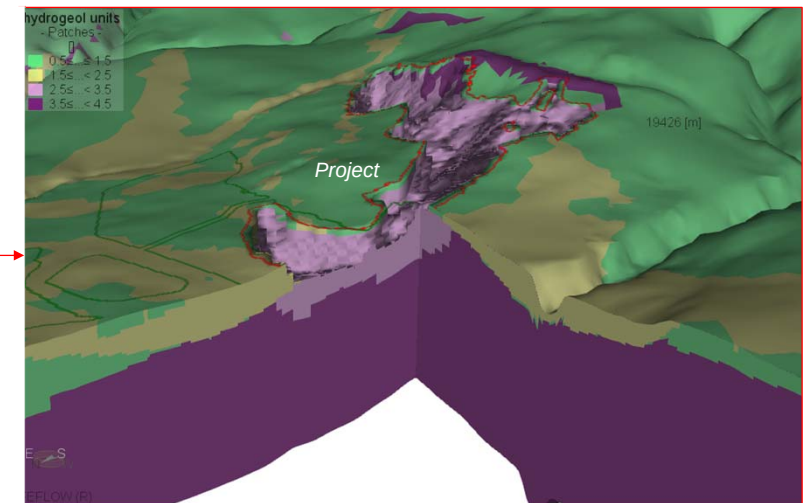
		Groundwater Technical Report		
		Boundary conditions		
Job No: 1CT027.004 Filename: Fig53_Boundary conditions.pptx	Tenas Project	Date: Dec 2020	Approved: GF	Figure: 53



Baseline scenario



EOM / Post-closure scenarios



- Silt-clay-rich till
- Sand-gravel-rich till
- Sedimentary rocks
- Volcanic rocks

 Job No: 1CT027.004 Filename: Fig54_3D view Hydrostat/GwModel.pptx	 Tenas Project	Groundwater Technical Report		
		3D view of the numerical model		
		Date: Nov 2020	Approved: GF	Figure: 54

