Photo's Done

Post Flood Bridge Inspection Form

Bridge File Number	01741-1	**Inspector Name**	J. RUSO
Location Description	HIGHWOOD RIVER BRIDGE ON HIGHWAY 22, 1 KM S OF LONGVIEW	**Assistant Name**	
		Inspection Date	13-JULY-2013.

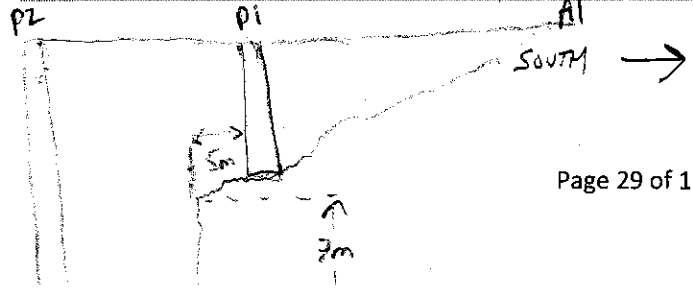
Legal Land Location	NE SEC 17 TWP 18 RGE 2 W5M
Longitude; Latitude	-114.234062;50.522899
Unique Span Types	PO, CS

Approach Road	NO VISIBLE FLOOD DAMAGE
Approach Guardrail	NO VISIBLE FLOOD DAMAGE
Approach Embankment	NO SIGNS OF EMBANKMENT EROSION DUE TO FLOODING

Vertical Alignment	H/V BRIDGE ALIGNMENT IS GOOD.
Horizontal Alignment	

Superstructure General	BEARINGS / GIRDER ALIGNMENT APPEAR UNAFFECTED FROM FLOOD

Abutment Backwall	NO VISIBLE DAMAGE
Abutment Wingwall	NO VISIBLE DAMAGE
Abutment Piles	NOT VISIBLE
Abutment Stability	STABLE ABUTMENTS. NO SIGNS OF FLOOD RELATED INSTABILITY.
Abutment Scour/Erosion	EROSION AT NORTH HEADSLOPES - NOT FLOOD RELATED AND APPEARS STABLE
Pier Piles	NOT VISIBLE
Pier Stability	NO LEANING OR TIPPING. PIER STABILITY LOOKS OK.
Pier Scour/Erosion	EROSION AT SOUTH PIER (PIER 1) IS SEVERE SEE PHOTOS + SKETCH BELOW.
Pier Bracing/Struts/ Sheathing	N/A



APPROX. 50m LONG ALIGNED W/CHAN
APPROX. 25m LONG U/S + SOUTH OF BRIDGE.

Post Flood Bridge Inspection Form

Bridge File Number	01741-1	**Inspector Name**	J. RUSJ
Location Description	HIGHWOOD RIVER BRIDGE ON HIGHWAY 22, 1 KM S OF LONGVIEW	**Assistant Name**	
		Inspection Date	13-JULY-2013

Legal Land Location	NE SEC 17 TWP 18 RGE 2 W5M
Longitude; Latitude	-114.234062;50.522899
Unique Span Types	PO, CS

Channel Alignment	CHANNEL ALIGNMENT IS O.K.. OVERBANK FLOW HITS S.W. ABUTMENT EMBANKMENT TOE.
High Water Mark	DEBRIS CAUGHT ON PIER AND GABION BASKET MESH GIVES AN APPROX. H.W.M. OF 2m BELOW T.O.C.
Bank Stability	UNSTABLE BANKS AT NORTH BOTH U/S + D/S
Drift/Debris	LARGE DEBRIS/DRIFT LINE D/S TO S.E.
Slope Protection	GABION BASKET AT BASE OF NORTH ABUTMENT SLOPE IS O.K. EROSION + NO PROTECTION AT TOE OF SOUTH SLOPE.
Guidebank/Spurs	GABION BASKET AT NORTH.
Drainage	NO OVERLAND/DITCH DRAINAGE PROBLEMS
Adequacy of Opening	ADEQUATE

Other Item	
Other Item	
Other Item	
General Comment	PROTECTION ~~AT~~ AND REPAIR OF SOUTH PIER SLOPE RECOMMENDED.

File No.	01741
Date	July 13, 2013
Photos By	J. Rusu
Stream/Highway/Location	Highwood River / Hwy 22 / Longview

Photo 1
From NW abut. embankment looking south at west girder line. Horizontal and vertical alignments are good.

Photo 2
From NE embankment looking west (u/s) at bridge.

File No.	01741
Date	July 13, 2013
Photos By	J. Rusu
Stream/Highway/Location	Highwood River / Hwy 22 / Longview

Photo 3: From SE abut. embankment looking north at east d/s girder line. Horizontal and vertical alignments are good. Gabions in place at north headslope but may be missing riprap at U/S end.

Photo 4
From SW bank looking d/s at bridge. Vertical alignment looks good.

File No.	01741
Date	July 13, 2013
Photos By	J. Rusu
Stream/Highway/Location	Highwood River / Hwy 22 / Longview

Photo 5
Looking u/s from NE bank at P1 and P2, note erosion under P1.

Photo 6
Looking d/s from SW bank at erosion at south headslope - beneath P1.

File No.	01741
Date	July 13, 2013
Photos By	J. Rusu
Stream/Highway/Location	Highwood River / Hwy 22 / Longview

Photo 7
Looking d/s from SW bank at extent of erosion around SW corner.

Post Flood Bridge Inspection Form

Bridge File Number	73389-1	**Inspector Name**	J. RUSU
Location Description	STIMSON CREEK BRIDGE ON HIGHWAY 22, 16 KM S OF LONGVIEW	**Assistant Name**	
		Inspection Date	14-JULY-2013

Legal Land Location	NW SEC 33 TWP 16 RGE 2 WSM
Longitude; Latitude	-114.226219;50.392101
Unique Span Types	DBT

Approach Road	NO VISIBLE DAMAGE
Approach Guardrail	NO VISIBLE FLOOD DAMAGE
Approach Embankment	NO VISIBLE FLOOD DAMAGE

Vertical Alignment	GOOD V/H BRIDGE ALIGNMENT
Horizontal Alignment	- NO ABUTMENT SETTLEMENT / SHIFTING WHICH WOULD AFFECT ALIGNMENTS

Superstructure General	NO VISIBLE FLOOD DAMAGE. BRIDGE APPEARS STABLE

Abutment Backwall	NO VISIBLE FLOOD DAMAGE
Abutment Wingwall	NO VISIBLE FLOOD DAMAGE
Abutment Piles	NOT ACCESSIBLE
Abutment Stability	STABLE ABUTMENTS
Abutment Scour/Erosion	SCOUR DUE TO HIGHWATER AND/OR CATTLE TRACKING AT NORTH HEADSLOPES. NE + NW DRAIN TROUGHS COMPLETELY UNDERMINED.
Pier Piles	NO PIERS
Pier Stability	N/A
Pier Scour/Erosion	N/A
Pier Bracing/Struts/ Sheathing	N/A

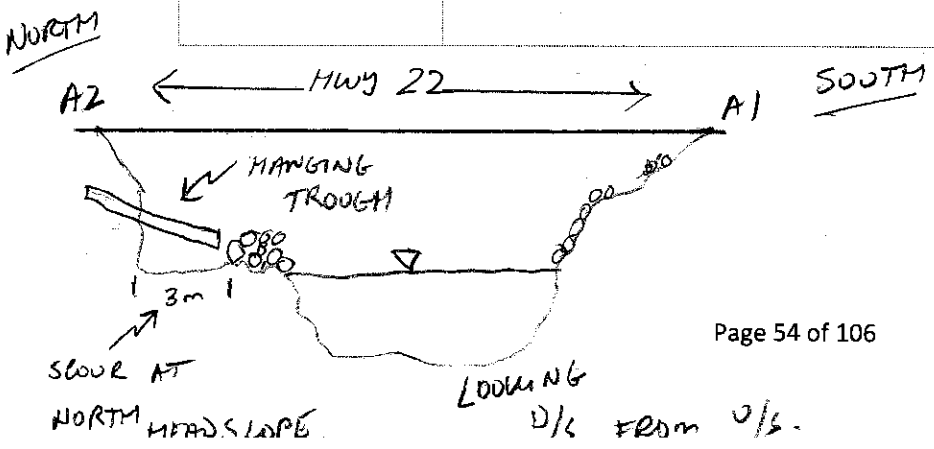
Post Flood Bridge Inspection Form

Bridge File Number	73389-1	**Inspector Name**	J. RUSO
Location Description	STIMSON CREEK BRIDGE ON HIGHWAY 22, 16 KM S OF LONGVIEW	**Assistant Name**	
		Inspection Date	14-JULY-2013

Legal Land Location	NW SEC 33 TWP 16 RGE 2 W5M
Longitude; Latitude	-114.226219;50.392101
Unique Span Types	DBT

Channel Alignment	O.K. NO PROBLEMS OR VISIBLE FLOOD DAMAGE
High Water Mark	1.8m BELOW T.O.C. - GRASS CAUGHT ON S.W. FENCING AT U/S
Bank Stability	SOME EROSION @ U/S + D/S BANKS - STABLE
Drift/Debris	DRIFT LINE AND DEBRIS CAUGHT ON U/S FENCING
Slope Protection	ADD 50 m^3 OF CLASS II RIP RAP TO NORTH HEADSLOPE & INCLUDE CATTLE TRACK TO ALLOW FOR CATTLEPASS
Guidebank/Spurs	NONE AT THIS BRIDGE.
Drainage	NO VISIBLE FLOOD DAMAGE.
Adequacy of Opening	ADEQUATE.

Other Item	
Other Item	
Other Item	
General Comment	EROSION REPAIRS AT DRAIN TROUGHS AND ADDITION OF SCOUR PROTECTION AT NORTH ABUTMENT HEADSLOPE RECOMMENDED.



File No.	73389-1
Date	July 14, 2013
Photos By	J. Rusu
Stream/Highway/Location	Stimson Creek/ Hwy 22/ Longview

Photo 1
Looking south from NE embankment along east girder line.

Photo 2
Looking d/s (east) from NW u/s bank.

File No.	73389-1
Date	July 14, 2013
Photos By	J. Rusu
Stream/Highway/Location	Stimson Creek/ Hwy 22/ Longview

Photo 3
Looking north from SW embankment along west girder line.

Photo 4
Looking u/s (west) from SE d/s bank.

File No.	73389-1
Date	July 14, 2013
Photos By	J. Rusu
Stream/Highway/Location	Stimson Creek/ Hwy 22/ Longview

Photo 5
North headslope erosion and hanging drain troughs - replacement fill and scour protection required.

Bridge Inspection

Bridge File Number	74458 N-2 Bridge	Form Type	SG
Year Built/Year Supstr	1997/1997	Lot No.	2
Bridge or Town Name	ALDERSYDE	Inspector Name	T CAREY
Located Over	HIGHWOOD RIVER, 2.13.27, WATERCRS-ST	Inspector Class	A
Located On	2:12 R1 11 802	Assistant Name	
Water Body Cl./Year		Assistant Class	
Navigabil. Cl./Year		Inspection Date	JULY 11/13
Legal Land Location	NE SEC 6 TWP 20 RGE 28 W4M	Data Entry By	
Longitude, Latitude	::, ::	Data Entry Date	
Road Authority	Alberta Transportation (AIT)	Reviewer Name	
Contract Main. Area	CMA27	Review Date	
Clear Roadway/Skew	12.4 / -20 deg. (LHF)	Dept. Reviewer Name	
AADT/Year	15,240 / 2011 (A)	Dept. Review Date	
Road Classification	RFD-412.4-130	Follow-Up By	
Detour Length (km)	1		

Allowable Load (t):	Single	CS1 28	Semi	CS2 49	Train	CS3 62	--> On Critical Spans -->Critical Member
Design Loading:	CS750						--> Primary Span

Posting Information

Required Load Posting (t)			Single		Semi		Truck Train		
Posted Loading (t)			Single		Semi		Truck Train		
Posted:	Lane	NB ✓	At Junction (Y/N)	No ✓	In Advance (Y/N)	No ✓	At Bridge (Y/N)	No ✓	
Posted:	Lane		At Junction (Y/N)		In Advance (Y/N)		At Bridge (Y/N)		
Remarks	Not required								

Hazard Marker At Bridge (Y/N)	No ✓
Remarks	
Other Sign Types	CURVE, ✓

Utilities (Located at)

Utility Attachments			
Telephone	@ NORTH R/W ✓	Gas	
Power		Municipal	
Others		Problem (Y/N)	No ✓
Remarks			

Approach Road

		Last	Now	Explanation of Condition
Horizontal Alignment		7	7	Curve to West ✓
Vertical Alignment		8	9	
Roadway Width (m)	13.000 ✓			
Approach Bump		6	6	
Guardrail (Y/N)	Yes ✓			4.2m@ West ✓
Guardrail		4	4	Insuficient posts @ 1.9m spacing ✓ Flare end @ West ✓
Length (m)	68.000 ✓			
Current Standard (Y/N)	No ✓			Wrong lap at both West end wing ends ✓
Termination Type	TURNDOWN ✓			- NOT THRIE BEAM
Drainage		7	7	
Approach Road General Rating		7	7	

Superstructure

Bridge Component	Last	Now	Explanation of Condition
(Primary Span : **WG, 3 Spans, Lengths(m): 28-35-28, A-Ident Number: A1278-01**)			
Special Features			
Special Feature		X	
(Type :)			
Special Feature		X	
(Type :)			
Wearing Surface/Deck Top Detail Ratings			
N (%) / 1 (%) / 2 (%) / 3 (%)			
Last	0 / 0 / 0 / 0		
Now	0 / 0 / 0 / 0		
Wearing Surface	7	7	Chipcoat on 50mm ACP ✓
(Material Type : **ACP - CONVENTIONAL CHIP SEAL COAT**) ✓			
(Thickness(mm) : **50**) ✓			
Deck Top	N	N	Paved Over.
Deck Rideability	7	7	
Deck Joints	7	7	Staining at abut. seats previous to deck pour ✓
Temperature (deg. C)	~~+~~ 22°C		
(Expansion Type :)	6 CANO		
(Fixed Type :)	6 C HNO		
Gap Size (mm) / Gap Location			
~~30~~ 70 / W ABUT ✓			
75 ✓ / E ABUT ✓			
Deck Drainage	7	7	
Drains Clogged (Y/N) : No ✓			
Curbs/Median	7	7	TRANSVERSE NARROW & MED CRACKS @ 1 m SPACING ✓
(Curb Type : **Standard**) ✓			
Scaling (Percent Area) : 0			
Bridge Rail	8	8	
(Type : **BRIDGE TUBE**) ✓			
Bridge Rail Posts	8	8	Galvanized rail. Pigmented sealer peeling at curb exterior ✓
(Type : **GALVANIZED POST STEEL;GALVANIZED POST STEEL**) ✓			
Bridge Rail/Posts Coating	5	5	
(Type :) GALVANIZED			
Sidewalk	X	X	
Girder/Beam			
Cover Plate	X	X	
Flange	7	7	
Web	7	7	
Stiffeners	7	7	
Splice	7	7	
Weld	7	7	
Diaphragms/Cross Frame	7	7	

Superstructure

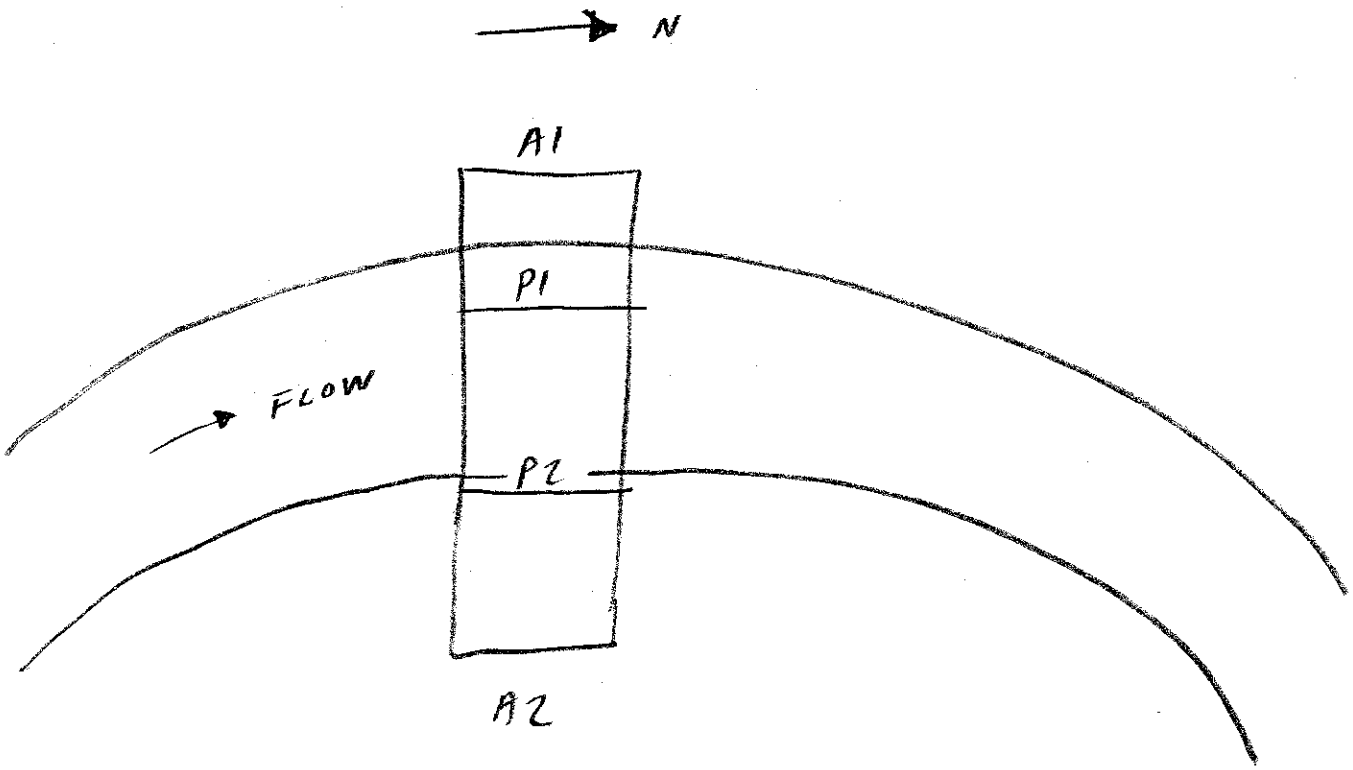
Bridge Component		Last	Now	Explanation of Condition
(Primary Span : **WG, 3 Spans, Lengths(m): 28-35-28, A-Ident Number: A1278-01**)				
Paint Condition		X	X	WEATHERING STEEL ✓
(Colour Description :)				
(Colour Code :)				
Touchup Required (Y/N)	No ✓			
Bearings		7	7	A/B are too high and missing 2 nuts at A2 ✓
Temperature (deg. C)	~~+22°C~~			7
(Expansion Type : **REINFORCED NEOPRENE BEARING WITH TEFLON AND STAINLESS STEEL**)	✓			- 2 - A1B TOO HIGH @ A1
(Fixed Type : **ROCKER BEARING**)	✓			
Coating Adequate (Y/N)	Yes ✓			
Functioning (Y/N)	Yes ✓			
Deck Underside		7	7	HAIRLINE TRANSVERSE CRACKS WITH EFFLORESCENCE @ EXTERIOR. ✓
Stains (Percent Area)	2 ✓			
Span Alignment Problems				
Vertical (Y/N)	No ✓			
Horizontal (Y/N)	No ✓			
Superstructure General Rating		7	7	

Substructure

Bridge Component		Last	Now	Explanation of Condition
Abutments				
Bearing Seats/Caps		8	8	
(Type : **CONCRETE**)				
Backwalls/Breastwalls		8	8	
Wingwalls		7	7	
Piles		N	N	Buried. ✓
Paint/Coating		7	7	
Abutment Stability		8	8	
Scour/Erosion		8	8	
Piers/Bents				
(Type : **PIER-COLUMN**)	✓			
Bearing Seats/Caps		8	8	
(Type : **CONCRETE**)	✓			
(Total Number of Bearing Piles : **4:4**)	✓			
Pier Shaft/Piles		8	8	
Bracing/Struts/Sheathing		8	8	Concrete blocks ✓
Nose Plate		X	X	
Paint/Coating		6	6	Galvanized ✓
(Colour Description :)				
(Colour Code :)				
Pier Stability		8	8	LOCALIZED SCOUR @ ENDS OF P2
Scour		7	N	- WATER TOO DEEP TO SEE SCOUR
Debris (Y/N)	~~YES~~			- MINOR

Substructure			
Bridge Component	**Last**	**Now**	**Explanation of Condition**
Substructure General Rating	8	8	

Structure Usage			
	Last	**Now**	**Explanation of Condition**
Channel			
(U/S Direction : **S**) ✓			
(D/S Direction : **N**) ✓			
Alignment	6	6	
Bank Stability	5	3	~~Steep cut @ North- D/S~~ - VERTICAL & UNSTABLE @ N.E. - SEVERE SCOUR ALL ALONG N.E. BANK
HWM (m below Top of Curb) Apr 3.7			~~No visible HWM~~
Drift (Y/N) No			- 1.5m FROM BOTTOM OF GIRDERS
Slope Protection	7	3	Class 2 @ West ✓ - SCOURED 50 mm Dia @ East ✓ @ N.E.
(Type : **RIP RAP; RIP RAP**) ✓			
Guidebank/Spurs	X	X	RIPRAP @ BRIDGE @ A1 STAYED IN PLACE DURING 2013 FLOOD.
Adequacy of Opening	7	5	
(Fish Compensation Measure 1 : **NONE**) ✓			
(Fish Compensation Measure 2 : **NONE**) ✓			
Channel General Rating	6	3	



Maintenance Recommendations

Inspector Recommendations	Year	Inspector Comments	Department Comments	Target Year	Est. Cost	Cat #
REPAIR/REPLACE BRIDGE RAIL						
GALVANIZE/PAINT BRIDGE RAIL						
RETROFIT BRIDGE RAIL						
SEAL CURBS						
PATCH DECK						
SEAL DECK						
OVERLAY DECK						
REPAIR/REPLACE DECK JOINTS						
RESET/ PAINT BEARINGS						
REPAINT SUPERSTRUCTURE						
STRAIGHTEN/REPLACE MEMBERS						
WASHING						
SHOTCRETE REPAIRS						
REPAIR ABUTMENT SCOUR/EROSION						
PLACE ADDITIONAL RIP RAP	2014	- GROOM + RIPRAP N.E. BANK				
REMOVE DRIFT ACCUMULATION	2014					
OTHER ACTION						
OTHER ACTION						
OTHER ACTION						
OTHER ACTION						

Structural Condition Rating (Last/Now) (%)	**83.3/**	**Sufficiency Rating (Last/Now) (%)**	**67.2/**	Est. Repl. Yr	2073	Maint. Reqd. (Y/N)	

Special Comments for Next Inspection		Department Comments	

Maintenance Reviewed By		Date		Estimated Total	0
Proposed Long-Term Strategy					
On 3-Year Program (Y/N)					
Proposed Action					

Previous Inspector's Name	Garry Roberts	Previous Assistant's Name	
Next Inspection Date	03-Jan-2015	Previous Inspection Date	03-Oct-2011
Inspection Cycle (Default) (months)	39		
Comment			

File No.	74458N
Date	July 11/13
Photos By	T Carey
Stream/Highway/Location	Highwood River/Hwy 2/Aldersyde

Photo 1 Looking west.

Photo 2 Looking north d/s.

File No.	74458N
Date	July 11/13
Photos By	T Carey
Stream/Highway/Location	Highwood River/Hwy 2/Aldersyde

Photo 3 Looking east.

Photo 4 Looking south u/s.

File No.	74458N
Date	July 11/13
Photos By	T Carey
Stream/Highway/Location	Highwood River/Hwy 2/Aldersyde

Photo 5 Looking d/s at bridge from s.e bank.

Photo 6 Looking north at south side of bridge.

File No.	74458N
Date	July 11/13
Photos By	T Carey
Stream/Highway/Location	Highwood River/Hwy 2/Aldersyde

Photo 7 Looking u/s at bridge from n.w. bank- scour at n.w. bank.

Photo 8 Scour at n.w. bank looking south towards bridge.

File No.	74458N
Date	July 11/13
Photos By	T Carey
Stream/Highway/Location	Highwood River/Hwy 2/Aldersyde

Photo 9 Scour at n.w. bank looking north from bridge.

Photo 10 Looking west along south side.

File No.	74458N
Date	July 11/13
Photos By	T Carey
Stream/Highway/Location	Highwood River/Hwy 2/Aldersyde

Photo 11 Localized scour at ends of P2.

Photo 12 Intact rip rap at A1.

File No.	74458N
Date	July 11/13
Photos By	T Carey
Stream/Highway/Location	Highwood River/Hwy 2/Aldersyde

Photo 13 Drift at P1.

Bridge Inspection

Bridge File Number	74458 S-1 Bridge	Form Type	CON
Year Built/Year Supstr	1957/1957	Lot No.	2
Bridge or Town Name	ALDERSYDE	Inspector Name	TCAREY
Located Over	HIGHWOOD RIVER, 2.13.27, WATERCRS-ST	Inspector Class	A
Located On	2:12 L1 11.749	Assistant Name	
Water Body Cl./Year		Assistant Class	
Navigabil. Cl./Year		Inspection Date	JULY 11/13
Legal Land Location	NE SEC 6 TWP 20 RGE 28 W4M	Data Entry By	
Longitude, Latitude	:, :	Data Entry Date	
Road Authority	Alberta Transportation (AIT)	Reviewer Name	
Contract Main. Area	CMA27	Review Date	
Clear Roadway/Skew	15.2 /	Dept. Reviewer Name	
AADT/Year	15,240 / 2011 (A)	Dept. Review Date	
Road Classification	RFD-412.4-130	Follow-Up By	
Detour Length (km)	1		

Allowable Load (t):	Single	CS1 28	Semi	CS2 49	Train	CS3 62	---> On Critical Spans --->Critical Member	
Design Loading:	HS20						---> Primary Span	

Posting Information

Required Load Posting (t)			Single		Semi		Truck Train	
Posted Loading (t)			Single		Semi		Truck Train	
Posted:	Lane	NB ✓	At Junction (Y/N)		In Advance (Y/N)		At Bridge (Y/N)	
Posted:	Lane	SB ✓	At Junction (Y/N)	No ✓	In Advance (Y/N)	No ✓	At Bridge (Y/N)	No ✓
Remarks	Not required							

Hazard Marker At Bridge (Y/N)	No ✓
Remarks	
Other Sign Types	HIGHWOOD RIVER RIGHT LANE ENDS. ✓

Utilities (Located at)

Utility Attachments			
Telephone	At South side overhead and South row ✓	Gas	
Power		Municipal	
Others		Problem (Y/N)	No ✓
Remarks			

Approach Road

		Last	Now	Explanation of Condition
Horizontal Alignment		5	5	Curve West ✓
Vertical Alignment		8	8	
Roadway Width (m)	17.000 ✓			Road is higher than approach slab ✓
Approach Bump		4	4	
Guardrail (Y/N)	Yes ✓			Wrong lap at East end both sides ✓
Guardrail		4	4	Not thriebeam ✓
Length (m)	76.000 ✓			
Current Standard (Y/N)	No ✓			
Termination Type	TURNED DOWN END ✓			
Drainage		7	7	
Approach Road General Rating		6	5	

Superstructure

Bridge Component	Last	Now	Explanation of Condition
(Primary Span : **CT, 4 Spans, Lengths(m): 17.7-25-25-17.7, A-Ident Number:)**			
Special Features			
Special Feature	7	7	EXTERNAL STRENGTHENING RODS. ✓
(SType : **EXT SHEAR STIRRUP**) ✓			
Special Feature			
(Type :)			
Wearing Surface/Deck Top Detail Ratings			
N (%) 0 / 1 (%) 0 / 2 (%) 0 / 3 (%) 0 — Last			
N (%) 0 / 1 (%) 0 / 2 (%) 0 / 3 (%) 0 — Now			
Wearing Surface	5	4	Deck has holes drilled through ✓ for strengthening. Chip seal 80% worn- Rating concrete deck ✓ — 8 DECK SPALLS @ CORE HOLES ~~Minor spalls at core holes~~ Numerous 0.5mm wide transverse cracks ✓
(Material Type : **CONCRETE - CONVENTIONAL CHIP SEAL COAT**) ✓			
(Thickness(mm) : **50**) ✓			
Deck Top	5	5	
Deck Rideability	7	7	
Deck Joints	7	7	
Temperature (deg. C) ~~+~~ +22 °C			
(Expansion Type : **GLAND (WABO-MAUER, TRANSFLEX, ETC)**)			
(Fixed Type :)			
Gap Size (mm) / Gap Location			
~~75~~ 70 / W ABUT ✓			
~~75~~ 70 / E ABUT ✓			
Deck Drainage	7	7	
Drains Clogged (Y/N) No			
Curbs/Median	6	6	TRANSVERSE NARROW CRACKS @ 1m SPACING ✓
(Curb Type : **Standard**) ✓			
Scaling (Percent Area) 1 ✓			
Bridge Rail	7	3	- N.W. RAIL BROKEN OUT @ PARAPET
(Type : **GALVANIZED STEEL BRIDGE TUBE**) ✓			21 A/B nuts not fully engaged ✓
Bridge Rail Posts	4	4	
(Type : **GALVANIZED POST STEEL;GALVANIZED POST STEEL**) ✓			
Bridge Rail/Posts Coating	5	5	
(Type : **GALVANIZED**) ✓			
Sidewalk	X	X	
Girders	5	5	Shear cracks @ piers abutment @ girders 0.35mm. @ West span & 0.77mm @ East span @ South fascia girder strengthened ✓ ✓ Vertical cracks 1mm wide @ girder @ piers ✓
Diaphragms/Cross Frame	6	6	2 mm wide vertical cracks in several diaphragms. ✓
Bearings	7	7	Roller brgs @ abuts ✓ Rockers on East & West pier. ✓ Pinned at center pier on a pedestal. ✓
Temperature (deg. C) ~~+~~ +22 °C			
(Expansion Type : **ROLLER BEARING;ROCKER BEARING**) ✓ ✓			
(Fixed Type : **PINNED BEARING**)			
Coating Adequate (Y/N) Yes ✓			
Functioning (Y/N) Yes ✓			

Superstructure

Bridge Component		Last	Now	Explanation of Condition
(Primary Span : **CT, 4 Spans, Lengths(m): 17.7-25-25-17.7, A-Ident Number:**)				
Deck Underside		5	5	Numerousus patches and moderate cracks ✓
Stains (Percent Area)	1 ✓			some efflorescence @ cracks ✓
Span Alignment Problems				
Vertical (Y/N)	No ✓			
Horizontal (Y/N)	No ✓			
Superstructure General Rating		5	5	

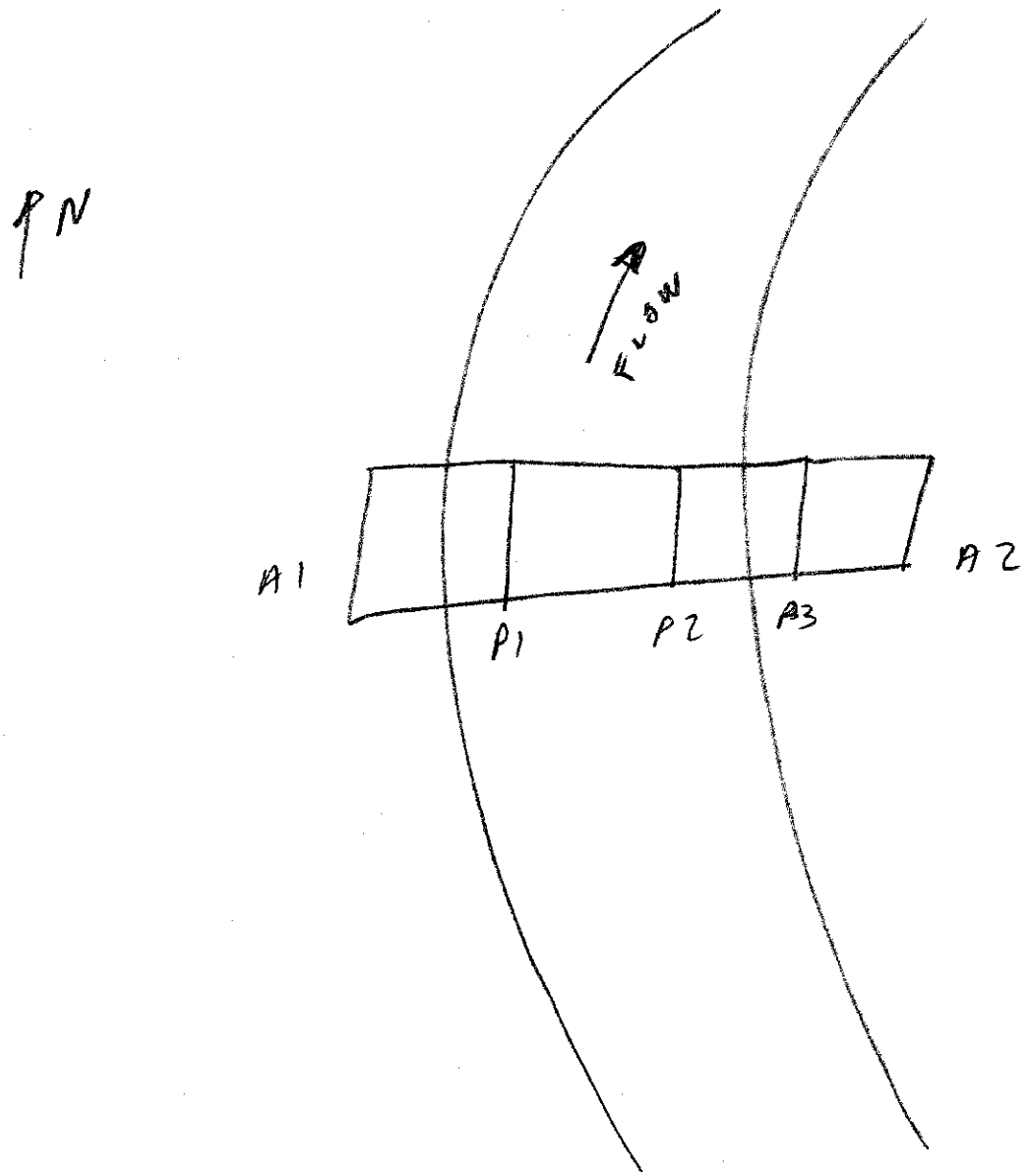
Substructure

Bridge Component		Last	Now	Explanation of Condition
Abutments				
Bearing Seats		7	7	
Backwalls/Breastwalls		7	5	- WIDE CRACK IN EAST
Wingwalls		7	7	
Piles		N	N	Buried.
Paint/Coating		X	X	
Abutment Stability		7	7	
Scour/Erosion		7	5	
Piers/Bents				
(Type : **PIER-SOLID**) ✓				
Bearing Seats/Caps		7	7	
(Type : **CONCRETE**) ✓				
Pier Shaft/Piles		6	6	
Nose Plate		4	4	Loose @ center pier ✓
Paint/Coating		4	4	Paint @ nose plates 90% Gone ✓
(Colour Description :)	PAINT			
(Colour Code :)	SILVER			
Pier Stability		7	7	
Scour		6	4	- SCOUR BEHIND P3
Debris (Y/N)	Yes ✓			(Old piles under span 3) ✓ DRIFT @ PIERS
Substructure General Rating		7	6	

Structure Usage

		Last	Now	Explanation of Condition
Channel				
(U/S Direction : **S**) ✓				
(D/S Direction : **N**) ✓				
Alignment		6	6	
Bank Stability		5	4	steep cut @ West + EAST - SCOURED @ N. W.
HWM (m below Top of Curb)	~~1.5~~			~~No visible HWM~~ - DRIFT ON PIER SEATS 300 mm HIGH
Drift (Y/N)	No ✓			
Slope Protection		5	4	- STEEP CUT @ WEST
(Type : **NATURAL: NATURAL**)				

Structure Usage			
	Last	Now	Explanation of Condition
Guidebank/Spurs	X	X	
Adequacy of Opening	6	5	- WATER ABOVE PIER SEATS BUT BRIDGE PASSED FLOOD WATER
(Fish Compensation Measure 1 : **NONE**) ✓			
(Fish Compensation Measure 2 : **NONE**) ✓			
Channel General Rating	5	4	



Maintenance Recommendations

Inspector Recommendations	Year	Inspector Comments	Department Comments	Target Year	Est. Cost	Cat #
REPAIR/REPLACE BRIDGE RAIL	2013	- REPAIR N. W. BRIDGE RAIL				
GALVANIZE/PAINT BRIDGE RAIL						
RETROFIT BRIDGE RAIL						
SEAL CURBS						
PATCH DECK	2014	PATCH CORE HOLE SPACES				
SEAL DECK						
OVERLAY DECK	2014 ✓	Chip coat deck for skid resistance ✓				
REPAIR/REPLACE DECK JOINTS						
RESET/ PAINT BEARINGS						
WASHING						
SHOTCRETE REPAIRS						
REPAIR ABUTMENT SCOUR/EROSION						
PLACE ADDITIONAL RIP RAP	2014	- CONSIDER RIP RAP				
REMOVE DRIFT ACCUMULATION	2014	INSTALL ALL ALONG				
OTHER ACTION		WEST BANK BETWEEN				
OTHER ACTION		BOTH BRIDGES				
OTHER ACTION						
OTHER ACTION						

Structural Condition Rating (Last/Now) (%)	66.7/	**Sufficiency Rating (Last/Now) (%)**	58.9/	Est. Repl. Yr	2025 ✓	Maint. Reqd. (Y/N)	Y

Special Comments for Next Inspection		Department Comments	

Maintenance Reviewed By		Date		Estimated Total	0

Proposed Long-Term Strategy			
On 3-Year Program (Y/N)			
Proposed Action			
Previous Inspector's Name	Garry Roberts	Previous Assistant's Name	
Next Inspection Date	03-Jan-2015	Previous Inspection Date	03-Oct-2011
Inspection Cycle (Default) (months)	39		
Comment			

File No.	74458S
Date	July 11/13
Photos By	T Carey
Stream/Highway/Location	Highwood River/Aldersyde

Photo 1 Looking west.

Photo 2 Looking north d/s.

File No.	74458S
Date	July 11/13
Photos By	T Carey
Stream/Highway/Location	Highwood River/Aldersyde

Photo 3 Looking east.

Photo 4 Looking south u/s.

File No.	74458S
Date	July 11/13
Photos By	T Carey
Stream/Highway/Location	Highwood River/Aldersyde

Photo 5 Looking south at north side of bridge.

Photo 6 Looking u/s at bridge from n.w. bank.

File No.	74458S
Date	July 11/13
Photos By	T Carey
Stream/Highway/Location	Highwood River/Aldersyde

Photo 7 Looking north d/s at bridge from s.e. bank.

Photo 8 Patched core hole spalls in deck.

File No.	74458S
Date	July 11/13
Photos By	T Carey
Stream/Highway/Location	Highwood River/Aldersyde

Photo 9 Parapet broken at n.w.

Photo 10 Scour behind P3.

File No.	74458S
Date	July 11/13
Photos By	T Carey
Stream/Highway/Location	Highwood River/Aldersyde

Photo 11 Looking west along south side- HWM drift on pier seat- 300mm high.

Photo 12 Minor scour at east bank under bridge.

File No.	74458S
Date	July 11/13
Photos By	T Carey
Stream/Highway/Location	Highwood River/Aldersyde

Photo 13 Looking east along north side.

Photo 14 West bank cut under bridge at P1.

File No.	74458S
Date	July 11/13
Photos By	T Carey
Stream/Highway/Location	Highwood River/Aldersyde

Photo 15 Cut bank at s.e.

Photo 16 Scour at n.w. bank.

File No.	74458S
Date	July 11/13
Photos By	T Carey
Stream/Highway/Location	Highwood River/Aldersyde

Post Flood Bridge Inspection Form

Bridge File Number	78527-1	**Inspector Name**	J. RUSU
Location Description	PEKISKO CREEK BRIDGE ON HIGHWAY 22, 10 KM S OF LONGVIEW	**Assistant Name**	
		Inspection Date	14-JULY-2013

Legal Land Location	SE SEC 20 TWP 17 RGE 2 W5M
Longitude; Latitude	-114.238646;50.445370
Unique Span Types	DBT

Approach Road	NO VISIBLE FLOOD DAMAGE.
Approach Guardrail	NO VISIBLE FLOOD DAMAGE.
Approach Embankment	NO VISIBLE FLOOD DAMAGE

Vertical Alignment	GOOD V/H BRIDGE ALIGNMENT.
Horizontal Alignment	NO INDICATION BRIDGE AFFECTED BY FLOODING

Superstructure General	NO VISIBLE FLOOD DAMAGE

Abutment Backwall	NO VISIBLE FLOOD DAMAGE.
Abutment Wingwall	NO VISIBLE FLOOD DAMAGE
Abutment Piles	NOT VISIBLE / NOT ACCESSIBLE.
Abutment Stability	STABLE ABUTMENTS. - NO VISIBLE INSTABILITY.
Abutment Scour/Erosion	MINOR ROCK DISPLACEMENT - STILL ADEQUATE.
Pier Piles	N/A - NO PIERS PROTECTION.
Pier Stability	N/A
Pier Scour/Erosion	N/A
Pier Bracing/Struts/ Sheathing	N/A

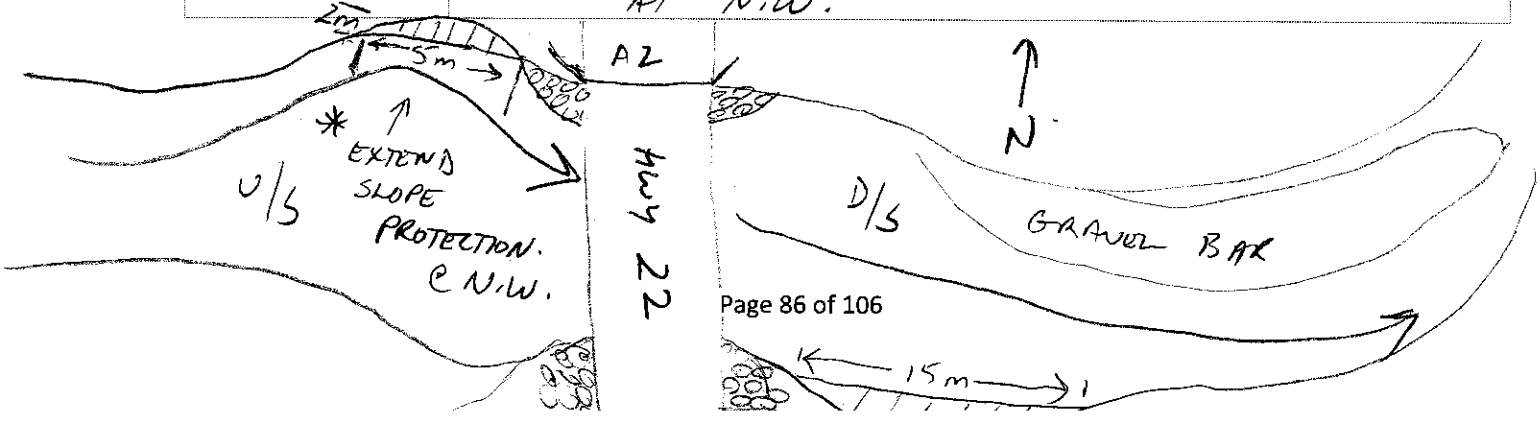
Post Flood Bridge Inspection Form

Bridge File Number	78527-1	**Inspector Name**	T. RUSU
Location Description	PEKISKO CREEK BRIDGE ON HIGHWAY 22, 10 KM S OF LONGVIEW	**Assistant Name**	
		Inspection Date	14-JULY-2013

Legal Land Location	SE SEC 20 TWP 17 RGE 2 W5M
Longitude; Latitude	-114.238646;50.445370
Unique Span Types	DBT

Channel Alignment	POOR U/S ALIGNMENT - RIVER ERODING N.W. CHANNEL EMBANKMENT - WELL AWAY FROM APPROACH ROAD EMBANKMENT
High Water Mark	5.5 m BELOW TOP OF CURB
Bank Stability	UNSTABLE BANKS U/S AT N.W. AND D/S AT S.E.
Drift/Debris	DRIFT AND DEBRIS CAUGHT IN U/S FENCING
Slope Protection	PROTECT U/S CHANNEL BANKS WITH 20-30 m^3/s CLASS 2 RIP RAP AT N.W.*
Guidebank/Spurs	RIP RAP GUIDEBANK AT N.W. RECOMMENDED
Drainage	NO VISIBLE FLOOD DAMAGE.
Adequacy of Opening	OPENING APPEARS ADEQUATE.

Other Item	
Other Item	
Other Item	
General Comment	OVERALL ASSESSMENT OF BRIDGE IS: 1) NO SIGNIFICANT FLOOD DAMAGE. 2) EXTEND CHANNEL ARMOUR 5-10m U/S AT N.W.



File No.	78527-1
Date	July 14, 2013
Photos By	J. Rusu
Stream/Highway/Location	Pekisko Creek/ Hwy 22/ Longview

Photo 1
Looking d/s (east) from u/s channel.

Photo 2
Looking north from SW embankment along west girder line.

File No.	78527-1
Date	July 14, 2013
Photos By	J. Rusu
Stream/Highway/Location	Pekisko Creek/ Hwy 22/ Longview

Photo 3
Looking u/s (west) from d/s channel.

Photo 4
Looking south from NE abutment embankment along east girder line.

File No.	78527-1
Date	July 14, 2013
Photos By	J. Rusu
Stream/Highway/Location	Pekisko Creek/ Hwy 22/ Longview

Photo 5
Scour at NW embankment 30m upstream of bridge.

Appendix 3 Highwood River Water Allocation Licenses

Appendix 3A Surface-Diversions-Licences

Advisian
WorleyParsons Group

Appendix 3A

Surface-Diversions-Licences

APPROVAL ID	PRIORITY[1]	LICENSEE	POINT OF DIVERSION[2]	SOURCE[3]	VOLUME[4]	DIVERSION RATE[5]	TYPE	PURPOSE[5]
25179	1992-09-21-001	BAR S RANCH	SE-27-015-02-5	Tributary to Meinsinger Creek	1230		Surface	Agricultural
26162	1991-04-23-011	BASIN LAND & CATTLE LTD.	NE-10-017-02-5	Tributary to Stimson Creek	2460		Surface	Agricultural
26225	1991-04-03-021	Harty, Theodore & Barbara	NW-28-016-02-5	Tributary to Stimson Creek	11090		Surface	Agricultural
26728	1990-10-01-002	BAKER, ALLEN	SE-14-017-03-5	Tributary to Pekisko Creek	3690		Surface	Agricultural
26804	1990-08-15-001	GARDNER, HARVEY	NW-27-015-02-5	Tributary to Meinsinger Creek	3690		Surface	Agricultural
26805	1990-08-15-002	BAKER, ALLEN	NE-14-017-03-5	Tributary to Pekisko Creek	2460		Surface	Agricultural
27000	1990-04-30-001	SPACKMAN, LAWRENCE	SW-04-021-28-4	Tributary to Highwood River	3700		Surface	Agricultural
27222	1990-02-01-003	SPRUCE RANCHING CO-OPERATIVE LIMITED	NE-15-016-03-5	Tributary to Sheppard Creek	8630		Surface	Agricultural
27518	1989-07-31-006	ROSEBURN RANCHES LTD	NE-15-019-01-5	Tongue Creek	35770.98	0.054	Surface	Agricultural
27639	1989-06-06-007	THOMSON, JORDIE	SW-17-019-02-5	Tributary to Tongue Creek	2460		Surface	Agricultural
27847	1989-03-17-008	DAVIS, REX	SW-13-015-03-5	Tributary to Stimson Creek	2460		Surface	Agricultural
27871	1989-03-10-003	Looy, Dick & Barbara	SW-12-020-01-5	Tributary to Sheep River	2460		Surface	Agricultural
28348	1953-12-01-002	O H RANCH LTD	SE-17-019-03-5	Tributary to Tongue Creek	2460		Surface	Agricultural
28518	1988-01-15-008	McPherson, Roy & Hugh	SE-06-017-02-5	Tributary to Stimson Creek	2460		Surface	Agricultural
28655	1987-09-28-005	AUGUSTINA FARMING LTD.	SW-23-021-28-4	Highwood River	17270	0.002	Surface	Agricultural
28703	1987-06-25-013	Riehs, Carl & William	SE-34-016-02-5	Tributary to Stimson Creek	1240		Surface	Agricultural
29172	1973-08-20-002	ALBERTINA FARMING LTD.	NW-12-021-28-4	Blizzard Lake	3700		Surface	Agricultural
29238	1986-03-10-003	Kendall, William & Joan	NE-17-019-02-5	Tributary to Tongue Creek	6160		Surface	Agricultural
29288	1986-02-18-003	PARADIS, JAMES	SW-26-017-02-5	Tributary to Stimson Creek	17270		Surface	Agricultural
29608	1985-05-21-004	HERRIMAN, WILLIAM	SE-06-019-02-5	Tributary to Tongue Creek	3700		Surface	Agricultural
29859	1985-01-08-007	COLWELL FARMS LTD.	SW-32-020-28-4	Sheep River	291100	0.01	Surface	Agricultural
30167	1984-04-03-007	STEPHENSON, R.	NW-26-018-03-5	Tributary to Highwood River	1240		Surface	Agricultural
31075	1982-04-20-002	MORRISON, ARTHUR	NE-24-019-02-5	Tributary to Tongue Creek	4930		Surface	Agricultural
31183	1982-02-04-011	Botero, Arturo & Blancho	NW-04-019-02-5	Tributary to Tongue Creek	4930		Surface	Agricultural
31258	1988-12-02-007	BELL & OCZKOWSKI, BARBARA	SW-08-020-28-4	Highwood River	9870	0.005	Surface	Agricultural
31489	1980-06-20-003	KIENTZ, ALPHONSE	SE-30-019-01-5	Tributary to Tongue Creek	2460		Surface	Agricultural
31530	1980-05-06-008	KIEMELE, DON	NE-04-019-02-5	Tributary to Tongue Creek	3700		Surface	Agricultural
31562	1981-01-05-001	PEKISKO CATTLE (1983) LTD.	NE-18-017-02-5	Tributary to Pekisko Creek	1240		Surface	Agricultural
31901	1979-07-20-007	CLARKE, DANIEL	NE-02-020-01-5	Tributary to Tongue Creek	1240		Surface	Agricultural
32120	1979-03-09-003	KINGSFORD, DOUGLAS	NW-23-018-02-5	Tributary to Highwood River	4930		Surface	Agricultural
32187	1979-02-14-001	WESTERN FEEDLOTS LTD.	SE-32-018-29-4	Highwood River	518060	0.025	Surface	Agricultural
33232	1977-04-15-003	HERRIMAN, ALVIN	NW-34-018-01-5	Tributary to Highwood River	9860		Surface	Agricultural
33335	1977-01-12-002	Owens, Michael & Jean	SW-36-019-01-5	Tributary to Tongue Creek	7400		Surface	Agricultural
33682	1976-03-29-005	NELSON, LLOYD	NW-19-018-29-4	Tributary to Highwood River	16030		Surface	Agricultural
33963	1975-07-07-003	STEELE, HOWARD	NE-20-019-02-5	Tributary to Tongue Creek	3700		Surface	Agricultural
34029	1982-02-04-012	KENNEDY, SHELDON and SPRINGBANK INVESTMENT CORPORATION	NW-07-020-28-4	Tributary to Highwood River	2460		Surface	Agricultural
34078	1975-04-28-002	WYATT, JAMES	SE-02-019-02-5	Tributary to Tongue Creek	1240		Surface	Agricultural
34130	1975-02-28-002	HERRIMAN, ELIZABETH	NE-18-018-01-5	Tributary to Highwood River	2460		Surface	Agricultural
34132	1975-02-28-001	SORKILMO, GEORGE	NW-18-018-01-5	Tributary to Highwood River	2460		Surface	Agricultural
34133	1975-02-28-004	PEKISKO CATTLE (1983) LTD.	NE-21-018-01-5	Tributary to Highwood River	3700		Surface	Agricultural
34519	1975-01-30-002	Looy, Dick & Barbara	NW-01-020-01-5	Tributary to Tongue Creek	4930		Surface	Agricultural
35064	1986-07-10-005	MILLER, JOHN	NE-36-018-02-5	Tributary to Highwood River	2460		Surface	Agricultural

Appendix 3A

Surface-Diversions-Licences

APPROVAL ID	PRIORITY[1]	LICENSEE	POINT OF DIVERSION[2]	SOURCE[3]	VOLUME[4]	DIVERSION RATE[5]	TYPE	PURPOSE[5]
35594	1972-10-23-002	HIGHWOOD VALLEY RANCH LTD	NE-13-018-30-4	Tributary to Highwood River	3700		Surface	Agricultural
35650	1972-09-25-003	CLIFFORD, RAYMOND	NW-11-017-02-5	Tributary to Stimson Creek	9860		Surface	Agricultural
35742	1981-03-16-004	SPRUCE RANCHING CO-OPERATIVE LIMITED	SE-24-016-03-5	Tributary to Stimson Creek	3700		Surface	Agricultural
35743	1981-03-16-003	SPRUCE RANCHING CO-OPERATIVE LIMITED	NE-13-016-03-5	Tributary to Stimson Creek	4930		Surface	Agricultural
35830	1980-12-31-004	MOUNT SENTINAL RANCH LTD	SE-08-016-02-5	Tributary to Stimson Creek	18500		Surface	Agricultural
35931	1972-08-29-002	PARKER, RALPH	SW-10-019-01-5	Tributary to Tongue Creek	2460	0.001	Surface	Agricultural
35932	1972-09-08-001	TEE-H FARM & RANCH LTD	NE-34-018-02-5	Tributary to Tongue Creek	3700		Surface	Agricultural
36622	1971-08-12-004	JENNINGS, REG and WOLFE, FRANK	SW-02-020-29-4	Tributary to Unnamed Stream	6160		Surface	Agricultural
36716	1973-08-13-003	NELSON, JOHN	SE-36-017-03-5	Tributary to Bull Creek	1240		Surface	Agricultural
37351	1969-01-09-001	LEBBERT, W.	SE-29-020-28-4	Tributary to Highwood River	4930		Surface	Agricultural
37902	1966-02-10-001	DEASE, CLEO	SE-12-018-02-5	Tributary to Highwood River	3700		Surface	Agricultural
37941	1965-11-02-003	SHEPPARD, HERBERT	SW-07-018-02-5	Bull Creek	3700		Surface	Agricultural
38247	1964-06-29-002	SMITH WYATT, IRENE	NW-01-019-02-5	Tributary to Tongue Creek	7400		Surface	Agricultural
38426	1963-10-10-004	ROWLAND, WILLIAM	NE-01-021-28-4	Tributary to Blizzard Lake	3700		Surface	Agricultural
38548	1964-01-03-002	76 LAND & CATTLE INC.	SE-04-017-02-5	Tributary to Stimson Creek	7400		Surface	Agricultural
38549	1963-07-09-001	MESABI RANCHES INC.	NE-23-017-02-5	Tributary to Stimson Creek	11100		Surface	Agricultural
38692	1963-02-19-004	BOKVIST, VERNER	NW-24-018-02-5	Tributary to Highwood River	3700		Surface	Agricultural
38693	1963-02-19-003	BOKVIST, VERNER	NE-24-018-02-5	Tributary to Highwood River	4930		Surface	Agricultural
38727	1963-01-24-001	ROGERS, CARSON	SE-07-019-01-5	Tributary to Tongue Creek	2460	0.001	Surface	Agricultural
38814	1962-11-26-002	DEPAOLI, AMELIO	SW-35-016-02-5	Tributary to Stimson Creek	6160		Surface	Agricultural
38872	1962-10-23-005	CARTWRIGHT, GORDON	SE-11-017-03-5	Tributary to Pekisko Creek	8630		Surface	Agricultural
38873	1904-02-11-001	CARTWRIGHT, HELEN ET AL	SE-35-016-03-5	Tributary to Pekisko Creek	101140		Surface	Agricultural
38956	1962-08-29-002	WYATT, JAMES	NW-06-019-01-5	Tributary to Tongue Creek	2460		Surface	Agricultural
39218	1962-08-07-004	OH RANCH LTD	SW-05-019-03-5	Tributary to Ings Creek	4930		Surface	Agricultural
39284	1961-10-12-006	Veilleux, Bruce & Annie	NE-14-019-02-5	Tributary to Tongue Creek	3700		Surface	Agricultural
39448	1961-03-10-001	STEAD, RONALD	NW-11-020-29-4	Tributary to Highwood River	3700		Surface	Agricultural
39878	1959-02-19-001	KING & SONS RANCHES LTD.	NE-20-019-01-5	Tributary to Tongue Creek	4930		Surface	Agricultural
39912	1958-10-30-002	Nelson, Ralph & A.	SE-31-016-02-5	Tributary to Stimson Creek	1240		Surface	Agricultural
39953	1958-09-08-003	GOING, GERALD	SE-30-017-02-5	Tributary to Pekisko Creek	4930		Surface	Agricultural
39962	1958-08-20-001	GRAHAM, PETRONELLA	NE-18-018-02-5	Tributary to Highwood River	4930		Surface	Agricultural
39982	1958-07-25-003	OH RANCH LTD.	NW-29-018-03-5	Tributary to Highwood River	56740		Surface	Agricultural
39999	1958-06-19-001	OH RANCH LTD	NE-32-018-03-5	Tributary to Ings Creek	4930		Surface	Agricultural
40135	1957-06-26-001	WIGHT, VERNON	NE-31-018-02-5	Tributary to Tongue Creek	14800	0.008	Surface	Agricultural
40181	1957-02-28-001	Schuhmann, Willi & Maria	NE-08-021-28-4	Tributary to Highwood River	3700		Surface	Agricultural
40324	1955-03-07-001	GARDNER, KATHERYN	SW-20-016-02-5	Tributary to Stimson Creek	2460		Surface	Agricultural
40425	1954-09-20-001	DEINES	NE-36-019-29-4	Tributary to Highwood River	3700		Surface	Agricultural
40452	1953-12-01-001	O H RANCH LTD	SW-17-019-03-5	Tributary to Tongue Creek	2460		Surface	Agricultural
40658	1951-06-27-001	CANDOR INVESTMENTS LTD.	SE-02-019-03-5	Tributary to Highwood River	3700		Surface	Agricultural
41768	1944-12-14-002	BROCKLEBANK, DAN	SW-24-019-01-5	Tributary to Tongue Creek	7400		Surface	Agricultural
42524	1941-04-28-014	GOING, GERALD	NE-25-017-03-5	Tributary to Bull Creek	7400		Surface	Agricultural
42525	1941-04-28-013	ROBERTSON, ALEXANDER	NE-18-017-02-5	Tributary to Pekisko Creek	38230		Surface	Agricultural
42528	1941-04-28-011	NELSON, MELVIN	SW-22-017-03-5	Tributary to Bull Creek	33300		Surface	Agricultural

APPROVAL ID	PRIORITY[1]	LICENSEE	POINT OF DIVERSION[2]	SOURCE[3]	VOLUME[4]	DIVERSION RATE[5]	TYPE	PURPOSE[5]
42529	1941-04-28-010	BAKER, ALLEN	NW-28-017-03-5	Bull Creek	8630		Surface	Agricultural
42560	1940-10-11-001	ROBERTSON, ALEXANDER	SE-07-018-02-5	Tributary to Bull Creek	6160		Surface	Agricultural
42568	1940-10-07-002	GOSS, DONALD	NW-15-019-02-5	Tributary to Tongue Creek	2460		Surface	Agricultural
42569	1940-10-07-001	GOSS, ELMER	SE-16-019-02-5	Tributary to Tongue Creek	4933.93		Surface	Agricultural
42622	1940-02-21-002	BROCKLEBANK RANCHES	SW-11-019-01-5	Tributary to Tongue Creek	4930		Surface	Agricultural
42927	1939-05-22-005	WYATT, JAMES	NE-16-019-02-5	Tributary to Tongue Creek	4930		Surface	Agricultural
42934	1939-05-17-001	LOCKHART, SAMUEL	NE-15-019-02-5	Tributary to Tongue Creek	1240		Surface	Agricultural
42935	1939-05-09-002	LOCKHART, SAMUEL	SW-14-019-02-5	Tributary to Tongue Creek	3700		Surface	Agricultural
42955	1939-04-06-001	MILLER, JOHN	NE-36-018-02-5	Tributary to Highwood River	2460		Surface	Agricultural
43466	1938-06-13-002	HARTLEY, ROBERT	NE-26-018-02-5	Tributary to Highwood River	2460		Surface	Agricultural
146853	1997-09-09-003	BAKER, J.	NW-08-017-02-5	Pekisko Creek	1234	0.001	Surface	Commercial
264157	1985-02-27-002	ALBERTA ENVIRONMENT AND SUSTAINABLE RESOURCE DEVELOPMENT	NW-17-020-28-4	Highwood River	20352		Surface	Government Holdback
309315	1974-10-29-005	ALBERTA ENVIRONMENT AND SUSTAINABLE RESOURCE DEVELOPMENT	NW-01-019-29-4	Highwood River	32194		Surface	Government Holdback
27770	1989-05-09-009	MUNICIPAL DISTRICT OF FOOTHILLS NO. 31	SW-29-019-28-4	Sewage Lagoon	3717720	0.119	Surface	Habitat Enhancement
219840	1988-11-23-002	DUCKS UNLIMITED CANADA, EDMONTON	SE-29-019-28-4	Highwood River	1233482		Surface	Habitat Enhancement
39969	1974-04-16-005	LEGACY OIL + GAS INC.	NE-17-018-02-5	Highwood River	1184142.97	0.059	Surface	Industrial
39969	1958-08-05-002	LEGACY OIL + GAS INC.	NE-17-018-02-5	Highwood River	468723.1	0.059	Surface	Industrial
29776	1985-03-07-005	NELSON, RALPH and DENNEY, NORM	NE-30-018-29-4	Highwood River	28370	0.05	Surface	Irrigation
29785	1985-02-27-004	BARRETT, BERNARD	SE-18-020-28-4	Highwood River	70310	0.038	Surface	Irrigation
29787	1985-02-27-001	550030 ALBERTA LTD	NW-17-020-28-4	Highwood River	54270	0.025	Surface	Irrigation
31148	1982-02-22-005	510546 ALBERTA LTD.	SW-29-020-28-4	Highwood River	30840	0.013	Surface	Irrigation
31417	1980-06-24-003	RANDLE FARMS LTD	NW-29-019-28-4	Highwood River	372510	0.101	Surface	Irrigation
31611	1980-03-10-001	Lockhart, John & May	NE-21-019-02-5	Tributary to Tongue Creek	23440		Surface	Irrigation
31641	1980-01-03-005	RICHARD & JAN ROENISCH	SW-15-018-01-5	Highwood River	128280	0.05	Surface	Irrigation
32103	1979-03-29-002	TONGUE CREEK FEEDERS LTD.	NW-16-019-01-5	Tongue Creek	39470	0.038	Surface	Irrigation
32886	1978-02-21-010	NELSON, RALPH	NW-29-018-29-4	Mosquito Creek	205990	0.05	Surface	Irrigation
33022	1977-10-18-005	1042682 ALBERTA LTD.	NW-01-019-29-4	Highwood River	135680	0.038	Surface	Irrigation
33727	1976-03-05-002	HILTON, CINDY	NE-20-020-28-4	Highwood River	27140	0.049	Surface	Irrigation
33863	1978-09-19-001	SCHMAUTZ, EMIL	SE-20-020-28-4	Highwood River	65370	0.05	Surface	Irrigation
33994	1975-07-07-001	MESABI RANCHES INC & 76 LAND & CATTLE INC	NW-03-017-02-5	Stimson Creek	185020	0.091	Surface	Irrigation
34240	1975-01-27-001	LEHIGH HANSON MATERIALS LIMITED	SE-06-020-28-4	Highwood River	60440	0.038	Surface	Irrigation
34343	1975-01-15-001	MISCULIANCE ENTERPRISE LTD.	SE-18-020-28-4	Highwood River	129520	0.032	Surface	Irrigation
34664	1981-10-09-021	WESTERN FEEDLOTS LTD.	SE-32-018-29-4	Highwood River	219560	0.106	Surface	Irrigation
34700	1981-09-10-014	SPARROW, ALBERT	SW-20-020-28-4	Highwood River	85110	0.038	Surface	Irrigation
35213	1973-08-13-002	76 LAND & CATTLE, MESABI RANCHES, BASIN LAND & CATTLE	NE-03-017-02-5	Stimson Creek	262730	0.072	Surface	Irrigation
35306	1973-05-14-001	HIGHWOOD GOLF & COUNTRY CLUB	NE-01-019-29-4	Highwood River	123350	0.045	Surface	Irrigation
37634	1968-01-10-001	Jewell, Alan & Connie	NW-30-019-28-4	Highwood River	74010	0.05	Surface	Irrigation
38530	1968-01-31-001	1552277 ALBERTA LTD.	NE-30-019-28-4	Highwood River	103610	0.05	Surface	Irrigation
38950	1962-08-29-003	BUSSER, EMIL	SW-20-019-28-4	Highwood River	123350	0.054	Surface	Irrigation
45177	1921-05-14-001	ALBERTA ENVIRONMENT AND SUSTAINABLE RESOURCE DEVELOPMENT	NW-06-019-28-4	Highwood River	18500		Surface	Irrigation
45742	1907-10-03-001	76 LAND & CATTLE INC., HUGH & SUSAN MCPHERSON, and BARKLEY, WAYN	SW-07-017-02-5	Pekisko Creek	185022.28	0.03	Surface	Irrigation
46187	1893-10-30-001	WESTERN FEEDLOTS LTD.	NW-30-018-29-4	Highwood River	177630	0.5	Surface	Irrigation

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Appendix 3A

Surface-Diversions-Licences

APPROVAL ID	PRIORITY[1]	LICENSEE	POINT OF DIVERSION[2]	SOURCE[3]	VOLUME[4]	DIVERSION RATE[5]	TYPE	PURPOSE[6]
78563	1978-03-30-008	WESTERN FEEDLOTS LTD.	NW-25-018-01-5	Highwood River	268900	0.088	Surface	Irrigation
208430	1962-07-24-002	CANADA FINANCE CORPORATION LIMITED	SW-05-020-28-4	Highwood River	61467	0.005	Surface	Irrigation
208436	1962-07-24-002	DARCY, SMITH	SW-05-020-28-4	Highwood River	8531	0.005	Surface	Irrigation
33863	1977-08-25-002	SCHMAUTZ, EMIL	SE-20-020-28-4	Highwood River	117180.77	0.05	Surface	Irrigation
33863	1975-11-10-005	SCHMAUTZ, EMIL	SE-20-020-28-4	Highwood River	44405.35		Surface	Irrigation
264156	1985-02-27-002	HIGHFIELD STOCK FARMS INC.	SE-18-020-28-4	Highwood River	183172	0.06	Surface	Irrigation
309312	1974-10-29-005	CHINOOK FEEDERS LTD.	NW-06-019-28-4	Highwood River	289744	0.06	Surface	Irrigation
327782	1975-11-10-005	KLASSEN, JOHN	SE-20-020-28-4	Highwood River	11101.33	0.436	Surface	Irrigation
327783	1975-11-10-005	TERRY, RANDY & FRED SCHMAUTZ	SE-20-020-28-4	Highwood River	33304.01	1.34	Surface	Irrigation
328070	1978-06-16-003	LAFARGE CANADA INC.	NW-30-018-29-4	Sqauw Coulee	30838	0.005	Surface	Irrigation
328071	1978-06-16-003	HIGHWOOD VALLEY RANCH LTD	NW-30-018-29-4	Sqauw Coulee	28371	0.045	Surface	Irrigation
327783	1977-08-25-002	TERRY, RANDY & FRED SCHMAUTZ	SE-20-020-28-4	Highwood River	88810.69	1.34	Surface	Irrigation
327783	1978-09-19-001	TERRY, RANDY & FRED SCHMAUTZ	SE-20-020-28-4	Highwood River	49339.27	1.34	Surface	Irrigation
327782	1977-08-25-002	KLASSEN, JOHN	SE-20-020-28-4	Highwood River	28370.08	0.436	Surface	Irrigation
327782	1978-09-19-001	KLASSEN, JOHN	SE-20-020-28-4	Highwood River	16035.26	0.436	Surface	Irrigation
45742	1907-10-03-001	76 LAND & CATTLE INC., HUGH & SUSAN MCPHERSON, and BARKLEY, WAYN	NE-01-017-03-5	Pekisko Creek	121411.62	0.019	Surface	Irrigation
45742	1907-10-03-001	76 LAND & CATTLE INC., HUGH & SUSAN MCPHERSON, and BARKLEY, WAYN	NE-17-017-02-5	Pekisko Creek	618677.49	0.084	Surface	Irrigation
45742	1907-10-03-001	76 LAND & CATTLE INC., HUGH & SUSAN MCPHERSON, and BARKLEY, WAYN	NE-01-017-03-5	Pekisko Creek	0		Surface	Irrigation
309312	2014-10-02-001	CHINOOK FEEDERS LTD.	NW-06-019-28-4	Highwood River	0	0.12	Surface	Irrigation
22052	1995-11-23-001	ALBERTA TOURISM, PARKS AND RECREATION	SE-33-016-05-5	Stony Creek	1230		Surface	Municipal
35873	1986-07-10-003	THE RIVERBEND RANCH TRUST	NW-20-018-02-5	Highwood River	1230		Surface	Municipal
38629	1963-04-19-001	MUNICIPAL DISTRICT OF FOOTHILLS NO. 31	SW-18-020-28-4	Highwood River	148017.82	0.061	Surface	Municipal
81044	1995-03-30-002	PARKS CANADA	NW-08-017-02-5	Pekisko Creek	1233.5	0.002	Surface	Municipal
142323	1986-11-10-001	STONEY BAND	SE-15-017-04-5	Highwood River	75243	0.008	Surface	Municipal
264532	1974-10-24-001	HIGHFIELD STOCK FARMS INC.	SE-18-020-28-4	Highwood River	416307	0.03	Surface	Other Purpose Specified by the Director
264532	2011-08-03-002	HIGHFIELD STOCK FARMS INC.	SE-18-020-28-4	Highwood River	0	0.03	Surface	Other Purpose Specified by the Director
44553	1933-10-05-001	WATER OPERATIONS BRANCH, LETHBRIDGE	NE-25-018-30-4	Highwood River	4933930	0.71	Surface	Water Management
44553	1979-07-26-001	WATER OPERATIONS BRANCH, LETHBRIDGE	NE-25-018-30-4	Highwood River	22212000	0.99	Surface	Water Management
48060	1997-09-02-003	ALBERTA INFRASTRUCTURE	NW-06-019-28-4	Highwood River	68600000	5.7	Surface	Water Management

NOTES:
(1) Priority - first in time first in right, based on the date of a complete application (YYYY-MM-DD-00X); e.g. 1958-11-03-001 = 1958(year), 11(month), 03(day), 001(database generated)
(2) Point of Diversion - the legal land location of the works; e.g. 12 or NE 08-007-06-4 = 12 or NE (legal subdivision and/or quarter section), 08 (section), 007(township), 06(range), 4(meridian)
(3) Source - Refer to the licence document for the approved source
(4) Volume - maximum annual quantity that may be diverted; units are in cubic metres
(5) Diversion Rate - maximum instaneous diversion rate; units for surface water diversion rate are cubic metres/second; units for an aquifer diversion rate are cubic metres/day
(6) Purpose - purposes are grouped into a classification system within a database. Refer to the licence document for approved purpose

Appendix 3B Well-Diversions-Licences

Appendix 3B
Well-Diversions-Licences

APPROVAL ID	PRIORITY[1]	LICENSEE	POINT OF DIVERSION[2]	SOURCE[3]	VOLUME[4]	DIVERSION RATE[5]	TYPE	PURPOSE[5]
24624	1993-12-13-027	Harty, Theodore & Barbara	14-06-018-01-5	Unnamed Aquifer	4320	130.92	Well	Agricultural
24625	1993-12-13-025	Harty, Theodore & Barbara	11-28-016-02-5	Unnamed Aquifer	1230	196.39	Well	Agricultural
24625	1993-12-13-026	Harty, Theodore & Barbara	01-28-016-02-5	Unnamed Aquifer	1230	13.09	Well	Agricultural
24626	1993-12-13-024	Harty, Theodore & Barbara	03-31-018-01-5	Unnamed Aquifer	2470	0.07	Well	Agricultural
24627	1993-12-13-023	Harty, Theodore & Barbara	16-07-019-01-5	Unnamed Aquifer	3080	98.19	Well	Agricultural
25900	1991-08-06-010	KIENTZ, ALPHONSE	03-30-019-01-5	Unnamed Aquifer	8630	130.92	Well	Agricultural
25900	1991-08-06-011	KIENTZ, ALPHONSE	03-30-019-01-5	Unnamed Aquifer	0	130.92	Well	Agricultural
26004	1991-06-07-002	Scott, James & Helen	13-08-021-28-4	Unnamed Aquifer	2470	130.92	Well	Agricultural
26099	1991-04-08-008	NOBLE, FRANK	08-09-019-29-4	Unnamed Aquifer	3700	32.73	Well	Agricultural
26099	1991-04-08-009	NOBLE, FRANK	01-09-019-29-4	Unnamed Aquifer	2470	65.46	Well	Agricultural
26099	1991-04-08-010	NOBLE, FRANK	01-09-019-29-4	Unnamed Aquifer	0	39.28	Well	Agricultural
26127	1991-04-08-005	MACKILLOP, LLOYD	11-14-019-29-4	Unnamed Aquifer	1230	26.18	Well	Agricultural
26127	1991-04-08-006	MACKILLOP, LLOYD	11-14-019-29-4	Unnamed Aquifer	6170	26.18	Well	Agricultural
26127	1991-04-08-007	MACKILLOP, LLOYD	11-14-019-29-4	Unnamed Aquifer	0	3.27	Well	Agricultural
26128	1991-04-08-013	McIntyre, Blaine & Helen	09-15-019-29-4	Unnamed Aquifer	4930	98.19	Well	Agricultural
26129	1991-04-08-011	McIntyre, Blaine & Helen	02-27-019-29-4	Unnamed Aquifer	1230	26.18	Well	Agricultural
26129	1991-04-08-012	McIntyre, Blaine & Helen	02-27-019-29-4	Unnamed Aquifer	3700	65.46	Well	Agricultural
26130	1991-04-08-004	TEE-H FARM & RANCH LTD	03-28-019-29-4	Unnamed Aquifer	2470	45.82	Well	Agricultural
26486	1989-10-20-008	ROSEBURN RANCHES LTD	09-22-019-01-5	Unnamed Aquifer	3700	52.37	Well	Agricultural
26487	1989-10-20-007	ROSEBURN RANCHES LTD	09-22-019-01-5	Unnamed Aquifer	2470	32.73	Well	Agricultural
26488	1989-10-20-004	ROSEBURN RANCHES LTD	10-15-019-01-5	Unnamed Aquifer	12330	45.82	Well	Agricultural
26488	1989-10-20-005	ROSEBURN RANCHES LTD	10-15-019-01-5	Unnamed Aquifer	13570	52.37	Well	Agricultural
26488	1989-10-20-006	ROSEBURN RANCHES LTD	10-15-019-01-5	Unnamed Aquifer	16040	65.46	Well	Agricultural
26488	1989-10-20-009	ROSEBURN RANCHES LTD	15-15-019-01-5	Unnamed Aquifer	11100	39.28	Well	Agricultural
27727	1989-04-17-005	CANDOR INVESTMENTS LTD.	11-08-019-03-5	Unnamed Aquifer	1230	39.28	Well	Agricultural
27728	1989-04-17-003	O H RANCH LTD	10-33-018-03-5	Unnamed Aquifer	3700	19.64	Well	Agricultural
27728	1989-04-17-004	O H RANCH LTD	10-33-018-03-5	Unnamed Aquifer	3700	26.18	Well	Agricultural
27909	1988-09-29-018	RALPH L NELSON RANCHES LTD	11-31-016-02-5	Unnamed Aquifer	3700	19.64	Well	Agricultural
28115	1988-09-29-004	DIEBEL, MARY	01-22-019-02-5	Unnamed Aquifer	1230	104.75	Well	Agricultural
28115	1988-09-29-005	DIEBEL, MARY	12-23-019-02-5	Unnamed Aquifer	1230	104.75	Well	Agricultural
28593	1987-11-13-009	Kinnear, D. & Sandra	12-10-019-02-5	Unnamed Aquifer	8260	130.92	Well	Agricultural
30769	1984-11-28-003	FORT MACLEOD-HIGHWOOD AUCTION	13-32-019-28-4	Unnamed Aquifer	4930	52.37	Well	Agricultural
30769	1984-11-28-004	FORT MACLEOD-HIGHWOOD AUCTION	14-32-019-28-4	Unnamed Aquifer	0	26.18	Well	Agricultural
31376	1993-11-15-002	MEDICINE TREE LAND & CATTLE CO. LTD.	04-21-018-01-5	Unnamed Aquifer	6780	65.46	Well	Agricultural
31376	1993-11-15-003	MEDICINE TREE LAND & CATTLE CO. LTD.	06-21-018-01-5	Unnamed Aquifer	11720	78.55	Well	Agricultural
31376	1993-11-15-004	MEDICINE TREE LAND & CATTLE CO. LTD.	04-21-018-01-5	Unnamed Aquifer	11100	78.55	Well	Agricultural
31376	1993-11-15-005	MEDICINE TREE LAND & CATTLE CO. LTD.	01-20-018-01-5	Unnamed Aquifer	3700	45.82	Well	Agricultural
31376	1993-11-15-006	MEDICINE TREE LAND & CATTLE CO. LTD.	01-20-018-01-5	Unnamed Aquifer	0	45.82	Well	Agricultural
31708	1968-09-30-002	TONGUE CREEK FEEDERS LTD.	01-16-019-01-5	Unnamed Aquifer	8630	65.46	Well	Agricultural
31708	1979-06-19-003	TONGUE CREEK FEEDERS LTD.	01-16-019-01-5	Unnamed Aquifer	9870	6.55	Well	Agricultural
31708	1979-06-19-004	TONGUE CREEK FEEDERS LTD.	02-16-019-01-5	Unnamed Aquifer	16040	65.46	Well	Agricultural
31708	1979-06-19-007	TONGUE CREEK FEEDERS LTD.	02-16-019-01-5	Unnamed Aquifer	8630	32.73	Well	Agricultural
31708	1979-06-19-008	TONGUE CREEK FEEDERS LTD.	01-16-019-01-5	Unnamed Aquifer	17270	78.55	Well	Agricultural

Appendix 3B
Well-Diversions-Licences

APPROVAL ID	PRIORITY[1]	LICENSEE	POINT OF DIVERSION[2]	SOURCE[3]	VOLUME[4]	DIVERSION RATE[5]	TYPE	PURPOSE[5]
31709	1979-06-19-005	TONGUE CREEK FEEDERS LTD.	08-09-019-01-5	Unnamed Aquifer	7400	0.65	Well	Agricultural
32022	1978-07-10-001	Earl, William & Elsie	03-13-018-01-5	Unnamed Aquifer	1230	0.65	Well	Agricultural
32465	1964-12-31-002	WEBB VALLEY STOCK FARM LTD	01-17-019-29-4	Unnamed Aquifer	18500	130.8	Well	Agricultural
34352	1986-11-12-001	ALBERTINA FARMING LTD.	04-13-021-28-4	Unnamed Aquifer	6170	32.73	Well	Agricultural
49122	1997-11-20-004	BIG FIRE RANCH LTD.	NW-26-016-02-5	Unnamed Aquifer	12217		Well	Agricultural
68298	1998-04-17-006	TONGUE CREEK FEEDERS LTD.	SE-09-019-01-5	Unnamed Aquifer	179091		Well	Agricultural
69788	1998-07-22-001	ROSEBURN RANCHES LTD	07-22-019-01-5	Unnamed Aquifer	59725.6	163.6	Well	Agricultural
225854	2005-11-16-001	STONEY TRAIL HOLDINGS LTD	NE-19-018-03-5	Unnamed Aquifer	307		Well	Agricultural
310364	1997-12-16-013	BLADES, ERNEST	SW-30-016-02-5	Unnamed Aquifer	1234	32.727	Well	Agricultural
28480	1988-06-10-001	CARGILL MEAT SOLUTIONS	NW-06-019-28-4	Highwood River	1180909	0.65	Well	Commercial
28636	1988-02-15-001	SADDLEBROOK INDUSTRIAL PARK LTD.	NW-31-019-28-4	Unnamed Aquifer	14800	0.65	Well	Commercial
29115	1986-11-12-002	ALBERTINA FARMING LTD.	13-12-021-28-4	Unnamed Aquifer	2470	32.73	Well	Commercial
209918	2004-06-28-002	ELDRIDGE, JOE	NE-11-019-29-4	Unnamed Aquifer	110.9		Well	Commercial
211371	2004-06-28-003	D.S. WHITFORD TRUCK SYSTEMS LTD.	NE-11-019-29-4	Unnamed Aquifer	65.5		Well	Commercial
248036	2008-04-25-002	NLC EQUIPMENT & REAL ESTATE INC.	SE-25-019-29-4	Unnamed Aquifer	400	95	Well	Commercial
211572	2004-06-28-002	ELDRIDGE, JOE	NE-11-019-29-4	Unnamed Aquifer	65.5	4.6	Well	Commercial
28125	1990-01-31-003	MUNICIPAL DISTRICT OF FOOTHILLS NO. 31	SW-06-019-28-4	Unnamed Aquifer	119650	327.31	Well	Municipal
31154	1982-12-10-001	VILLAGE OF LONGVIEW	15-17-018-02-5	Unnamed Aquifer	98680	733.19	Well	Municipal
33364	1977-01-21-001	ESTATES 552 CO-OPERATIVE LTD.	NE-20-021-28-4	Unnamed Aquifer	7400	52.32	Well	Municipal
45675	1984-02-13-002	TOWN OF HIGH RIVER	11-06-019-28-4	Unnamed Aquifer	1386614	3600.5	Well	Municipal
45675	1984-02-13-003	TOWN OF HIGH RIVER	11-06-019-28-4	Unnamed Aquifer	247930	3600.5	Well	Municipal
45675	1984-02-13-004	TOWN OF HIGH RIVER	12-06-019-28-4	Unnamed Aquifer	247930	3600.5	Well	Municipal
45676	1972-07-07-001	TOWN OF HIGH RIVER	12-06-019-28-4	Unnamed Aquifer	237816	3600	Well	Municipal
45676	1977-03-02-002	TOWN OF HIGH RIVER	SW-06-019-28-4	Unnamed Aquifer	3944	2421.8	Well	Municipal
152546	2002-05-15-004	NATURE'S HIDEAWAY CAMPGROUND LTD.	SW-26-021-28-4	Unnamed Aquifer	3600	38.2	Well	Municipal
45674	1995-01-27-012	TOWN OF HIGH RIVER	SW-01-019-29-4	Unnamed Aquifer	0	3756.5	Well	Municipal
45674	1995-01-27-012	TOWN OF HIGH RIVER	SW-01-019-29-4	Unnamed Aquifer	0	4123.6	Well	Municipal
45674	1995-01-27-012	TOWN OF HIGH RIVER	SW-01-019-29-4	Unnamed Aquifer	0	2978.2	Well	Municipal
45675	1984-02-13-004	TOWN OF HIGH RIVER	SW-01-019-29-4	Unnamed Aquifer	0	3756.5	Well	Municipal
45675	1984-02-13-004	TOWN OF HIGH RIVER	SW-01-019-29-4	Unnamed Aquifer	0	4123.6	Well	Municipal
45675	1984-02-13-004	TOWN OF HIGH RIVER	SW-01-019-29-4	Unnamed Aquifer	0	2978.2	Well	Municipal
45676	1978-03-15-003	TOWN OF HIGH RIVER	SW-01-019-29-4	Unnamed Aquifer	0	3756.5	Well	Municipal
45676	1978-03-15-003	TOWN OF HIGH RIVER	SW-01-019-29-4	Unnamed Aquifer	0	4123.6	Well	Municipal
45676	1978-03-15-003	TOWN OF HIGH RIVER	SW-01-019-29-4	Unnamed Aquifer	0	2978.2	Well	Municipal
23906	1995-11-08-001	ALBERTA TOURISM, PARKS AND RECREATION	02-29-016-05-5	Unnamed Aquifer	1230	0.65	Well	Recreation

NOTES:
(1) Priority - first in time first in right, based on the date of a complete application (YYYY-MM-DD-00X); e.g. 1958-11-03-001 = 1958(year), 11(month), 03(day), 001(database generated)
(2) Point of Diversion - the legal land location of the works; e.g. 12 or NE 08-007-06-4 = 12 or NE (legal subdivision and/or quarter section), 08 (section), 007(township), 06(range), 4(meridian)
(3) Source - Refer to the licence document for the approved source
(4) Volume - maximum annual quantity that may be diverted; units are in cubic metres
(5) Diversion Rate - maximum instaneous diversion rate; units for surface water diversion rate are cubic metres/second; units for an aquifer diversion rate are cubic metres/day
(6) Purpose - purposes are grouped into a classification system within a database. Refer to the licence document for approved purpose

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Appendix 3B
Well-Diversions-Licences

APPROVAL ID	PRIORITY[1]	LICENSEE	POINT OF DIVERSION[2]	SOURCE[3]	VOLUME[4]	DIVERSION RATE[5]	TYPE	PURPOSE[5]
Licence Information								
The water allocation licence information provided on this website is for the convenience of individuals researching the potential of arranging a water allocation transfer, or for other purposes. Alberta Environment endeavors to provide accurate information, but does not guarantee any part of the site is accurate or up-to-date. The information provided on the website should not be relied upon, and all data should be verified by examining the original paper documents in an Alberta Environment office prior to making any decisions or commitments. Water allocation licences are public information. Alberta Environment does not accept responsibility for any damages that may result from eliance on any information found on this website.								

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amec foster wheeler

Appendix B

Review of Flood Issues on Pekisko Creek and Stimson Creek

Memo

To: Hugh Pettigrew

Company: MD of Foothills No. 31

From: Amec Foster Wheeler

Date: 10 July 2015

CC: Joal Borggard

Ref: CW2167.03

Re: Desktop Review of Pekisko and Stimson Creeks Flood and Geomorphic Issues

1.0 INTRODUCTION

The study contained herein is a component of the 'Scoping Study of Flood Related Areas of Concern on the Highwood River and Little Bow River within the Municipal District of Foothills'.

Pekisko Creek and Stimson Creek are significant tributaries to the Highwood River. An understanding of flood issues on these streams is important for the following reasons: (1) a significant length of these streams drains through land that is owned by MD residents and is subject to flood and erosion; and (2) the flow, sediment and debris conveyed by these streams has an important bearing on the hydrology and morphology of the Highwood River, downstream of their respective confluences.

This report summarizes the information gathered and identifies future data requirements and studies.

1.1 Review of Existing Information

The following information was reviewed:

- Previous reports, flood discharge data from streamflow monitoring stations;
- Coarse level topographic information in order to plot a profile (elevation versus distance) of the basin;
- Field photographs available from other studies in the project area;
- Historic air photo imagery; and

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- Discussions with MD personnel on known flood issues affecting residents or MD infrastructure.

2.0 GENERAL WATERSHED CHARACTERISTICS

Pekisko Creek and Stimson Creek are significant tributaries to the Highwood River. The headwaters for both streams are located southwest of the MD of Foothills No. 31 (the MD). However, a large proportion of the watersheds are contained within the MD boundaries.

The majority of the MD's southwest area is located in the Pekisko and Stimson Creek watersheds (Figures 1 and 2). The Pekisko Creek confluence with the Highwood River is approximately 12 km downstream of Longview. Stimson Creek drains into Pekisko Creek approximately 3.7 km upstream of the confluence with the Highwood River. The Pekisko Creek confluence with the Highwood River is located 9 km southeast of Longview. Pekisko Creek is the last significant tributary to the Highwood River, upstream of the Town of High River. Table 1 below contains a summary of watershed areas. On a drainage area basis, Pekisko Creek at the confluence with The Highwood River represents about 28.6% of the entire watershed.

2.1 Summary of Watershed Areas

Location	Drainage Area (km^2)	Proportion of Highwood River Watershed Downstream of Pekisko Creek Confluence
Stimson Creek at Confluence with Pekisko Creek	249	13.5%
Pekisko Creek Above Confluence with Stimson Creek	244	13.3%
Pekisko Creek at Confluence with Highwood River	526	28.6%
Highwood River Upstream of Pekisko Creek Confluence	1315	71.4%
Highwood River Downstream of Pekisko Creek Confluence	1841	100.0%

The Pekisko Creek headwaters are located between the Highwood and Livingston Ranges of the Rocky Mountains approximately 10.5 km upstream of the MD boundary. Within the MD, Pekisko Creek drains northeast for 36 km to the Stimson Creek confluence and another 3.7 km to its confluence with the Highwood River. The watershed elevation ranges from approximately 1857 m to 1132 m. **Figure 3** shows the longitudinal channel profile.

The Stimson Creek headwaters are located between the Highwood and Livingston Ranges of the Rocky Mountains approximately 11 km upstream of the MD boundary. Within the MD, Stimson Creek drains northwards 26 km to the Pekisko Creek confluence. The watershed elevation ranges from 1419 km to 1132 km as shown in **Figure 3**.

A portion of the Chain Lakes Reservoir is located within the Stimson Creek watershed. The reservoir intercepts Meinsinger Creek, which is a tributary to Stimson Creek. The primary purpose of the Chain Lakes Reservoir is storage for the adjoining Willow Creek watershed and the majority of storage is from Willow Creek and not Stimson Creek. The low level flow outlet

from the Chain Lakes Reservoir North Dam drains into Meinsinger Creek, which flows north approximately 8 km to its confluence with Stimson Creek. The outlet is controlled by an auxiliary gate that maintains constant year round flows that support the riparian environment of Meinsinger Creek and further downstream on Stimson Creek. The Chain Lakes reservoir is primarily controlled through the South Dam which drains into Willow Creek. In flood conditions, excess flow passes through the spillway and emergency spillway at the South Dam, leaving the outfall at the North Dam largely unaffected. The following summary of recent floods and improvements to the structures is based on discussions with Amec Foster Wheeler engineers (Ken Kress and Steve Vaivada) who were involved in the design and construction of recent upgrades.

> During the flood of 2005, there was a risk of the South Dam overtopping due to volume of floodwaters draining into the reservoir. The North Dam was at less risk of failure as the crest of the North Dam was built higher than the crest of the South Dam (the South Dam would fail first, reducing the water levels at the North Dam). Improvements to both the North and South Dams were undertaken as a result of the 2005 flooding and the near failure of the South Dam. These improvements included additional spillway capacity at the South Dam and raising the North Dam. The North Dam Improvements Project, which was constructed between November 2011 and July 2012, raised the crest of the North Dam to 1301.6 m. The increased spillway capacity at the South Dam reduces the risk of damage to the dam structures.
>
> During the flood of 2013, the reservoir elevation again came close to overtopping the South Dam. At this time, the North Dam Improvements project was already completed, resulting in more freeboard compared to previous flood events. The South Dam Improvements Project, which started construction in September 2013 and is currently ongoing, will result in the crest of the South Dam being raised to 1301.3 m. Other improvements to the South Dam include the infill of the emergency spillway on the north side of the South Dam and the construction of a new spillway designed to handle much larger flow volumes. In flood conditions, the reservoir is designed to fail at the South Dam as a result of the Improvements Project.

Within the Pekisko and Stimson Creek watersheds, there are at least three push-up dams on tributaries that are visible in recent aerial imagery. A push-up dam is a water diversion structure reconstructed from river gravel and cobbles each spring. Using heavy machinery, river rock is "pushed-up" to raise the river level enough to divert irrigation water into a ditch. There are two on Stimson Creek and one on Pekisko Creek with legal land locations of NE 23-17-2 W5M, NW 11-17-2 W5M, and NW 17-17-2 W5M. Further information should be acquired for these and any other push-up dams within the Pekisko and Stimson watersheds to evaluate impacts resulting from a failure.

Several large scale reservoir studies have also been conducted for Pekisko and Stimson Creeks. One potential site was identified on Pekisko Creek and two were identified on Stimson Creek (AECOM-G 2014). None of the potential sites are preferential due to unreliable water supplies and no further action has occurred other than initial identification and preliminary design.

2.2 Sub-Watershed Delineation

The sub-watershed delineation contained below is based on the channel profile shown on Figure 3.

2.2.1 Lower Watershed

The 10 km of both creeks upstream of the Highwood confluence have similar characteristics. Both creeks have large radius meander bends and a similar channel gradient of 0.005 m/m. The Lower Watershed Drainage Areas are similar for the two creeks.

2.2.2 Middle Watershed

The Pekisko Creek middle watershed includes approximately 32 km of creek from the 10 km station to the 42 km station. This section of creek is a steeper gradient section than the lower watershed, with an average slope of approximately 0.01 m/m. The channel is relatively unconfined and quite mobile and has higher velocities due to the steeper channel gradient.

The Stimson Creek middle watershed's mainstem channel length includes approximately 16 km of creek between the 10 km and 26 km stations. This section also includes the Stimson Creek connection to Chain Lakes. This section of creek is very similar to the lower watershed as it also has a 0.005 m/m gradient. This section is slower moving than the middle watershed section of Pekisko Creek and as a result has a significantly less mobile channel with stable meanders that are partially confined by the valley wall.

2.2.3 Upper Watershed

Pekisko Creek in the upper watershed is a fast moving mountainous stream with a length of approximately 8.5 km. The headwaters are located between the Highwood and Livingston Ranges of the Rocky Mountains. The upper watershed is located in the Kananaskis Improvement District and includes the section of channel that extends from the source at the 50.5 km station up to the 42 km station. This section of creek has an average gradient of 0.035 m/m. The high topographic relief results in a well-developed drainage pattern with the channel confined to gullies and valleys. The Pekisko Creek upper watershed's elevation ranges from 1857 m to 1551 m.

The Stimson Creek headwaters extend to 1,419 m, which is significantly lower than the Pekisko Creek watershed. The mainstem channel length is approximately 10.5 km in the upper watershed, and extends from the source at the 36.7 km station to the 26 km station. The upper watershed is located within the Kananaskis Improvement District. The headwaters are located in between the Highwood and Livingston Ranges of the Rocky Mountains. The channel has a relatively steep gradient of 0.015 m/m. As a result this section of creek is significantly different than the rest of Stimson Creek with a more mobile channel rather than the stable meanders in the middle and lower watersheds.

2.3 Land Use

The middle and lower Pekisko and Stimson Creek watersheds that are located in the MD have a long history of ranching, as described in the Pekisko Valley Study (SALT 2011). Ranching continues to dominate the area, primarily through privately owned ranches, but also through Crown Land grazing leases. Figure 2 shows the property boundaries and ownership for this area. On Stimson Creek, all but the 1.5 km downstream of the southern MD border is privately owned land. On Pekisko Creek, approximately 18 km downstream from the MD border is crown owned grazing leased land. The remaining downstream length of Pekisko Creek is privately owned land. The approximate percentage breakdown for grazing leased land within the MD is 35% on Pekisko, 5% on Stimson, and 22.5% for both creeks together. The remaining percentage of land is privately owned.

3.0 HYDROLOGY

Hydrometric station 05BL023 Pekisko Creek near Longview is located 6.5 km southeast of Longview, just south of the 626 Ave and 144 St intersection. The station has a gross drainage area of 231.9 km2 which covers the majority of the entire watershed upstream of the confluence with Stimson creek. The station is active with data extending back to 1967.

Hydrometric station 05BL007 Stimson Creek near Pekisko is located approximately 6 km southeast of station 05BL023 Pekisko Creek near Longview. The station is just north of HWY- 540 approximately 4.5 km east of the intersection with HWY- 22.The Stimson Creek station has a gross drainage area of 236 km2 and has been active since 1911. However, no data was recorded between 1919 and 1938.

Hydrological data compiled from the above noted hydrometric stations is summarized in **Figures 4 and 5** (EnvCan 2015 & AECOM-B 2014). **Figure 6** contains a peak flow comparison of Pekisko Creek and Stimson Creek with 05BL019 Highwood River at Diebel's Ranch and Hogg Park. Diebel's Ranch is located on the Highwood River upstream of the Pekisko Creek confluence. The tributaries draining into the Highwood River between this station and the Pekisko confluence are minor therefore the flows recorded at this station represent the Highwood River flows upstream of Pekisko Creek. Hogg Park is located approximately 4.5 km downstream of the Highwood/Pekisko confluence on the Highwood River. Hence, Highwood River at Hogg Park flows include Pekisko and Stimson flows. Some general observations based on the hydrometric data are listed below:

- Pekisko & Stimson watersheds are of similar size, although Pekisko is somewhat larger and its headwaters are at a higher elevation;
- Pekisko peak flow discharges relative to Stimson are generally similar. Most years, the difference in flow between the two stations is minor. However, the differences in peak discharge can be significant in some years. During the 2013 flood, Stimson Creek saw a peak discharge of 227 m3/s which was much higher than the Pekisko discharge of 147 m3/s, however in 1976 the opposite was the case; and
- Peak flow discharges for Pekisko Creek at confluence with Highwood River can be estimated by adding the Pekisko and Stimson peak flow discharges that are recorded at the respective streamflow monitoring stations. The total Pekisko Creek peak discharge is

generally 50% of the Highwood River at Diebel's Ranch (i.e. Pekisko contributes approximately one third of the peak Highwood River discharge at Hogg Park). There are several years in which this is not the case, and the total Pekisko Creek discharge is higher than the Highwood River at Diebel's Ranch (2005 & 2011).

During the 2013 flood, both Pekisko Creek and Stimson Creek saw significant discharges, as noted above. As seen in Figures 4 and 5, the discharge for both creeks was the highest on record. In the comparison of Figure 6, the discharge for Pekisko and Stimson in 2013 was greater than the entire discharge of the Highwood River at Hogg Park in several previous years. In 2013, the combined discharge for Pekisko and Stimson was approximately 400 m3/s. The 2013 Highwood River at Hogg Park peak discharge of just over 1800 m3/s (AECOM-B 2014). That is the Pekisko and Stimson watersheds contributed approximately 25% of the peak discharge (assuming the peaks for the Upper Highwood, Pekisko and Stimson are relatively coincident). In the large flood of 1995, the proportion of the peak flow from the two creeks was approximately 20%. 2005 was the third largest recorded flood event and the proportion of the peak Highwood River at Hogg Park discharge represented by Pekisko and Stimson Creeks was closer to 40%.

4.0 COMPARATIVE AIR PHOTO REVIEW

The review of historic watershed and channel conditions was based on a comparison of air photos from 1948, 2012, and 2014. **Figures 7 and 8** provide some of this imagery. In all cases, the air photos did not cover the full extents of Pekisko and Stimson mainstem channels, but all three years did cover most of the extents of the channels within the MD. The 1948 imagery is from the National Airphoto Library and is at a scale of 14,000. Due to scale and lack of colour, the interpretation of channel changes is limited in comparison to 2012 and 2014 imagery. The 2012 imagery is from the MD and the 2014 imagery is from Google Earth. Both are high quality images that offer the ability to view the channel in detail.

The Stimson Creek 1948 aerial imagery included everything from the confluence with Pekisko Creek to approximately 5 km north (downstream) of the MD border. The 2012 imagery included the channel extents within the MD and the 2014 imagery covered the entire creek except for the downstream most 14 km.

In general, there hasn't been any major change in channel changes along Stimson Creek. In the areas that a 2012 and 2014 comparison could be made, there was very little change in channel location. Comparison between the 1948 and 2012/14 imagery shows some differences in channel location. Most of these differences included slight erosion on the outside of meander bends, and a few meander bend cutoffs. The most noticeable difference was a meander bend cutoff just east of the HWY- 22 crossing.

1948 imagery for Pekisko Creek covered the majority of channel within the MD. The portions missing included approximately 6 km just upstream of the Stimson confluence and 6.5 km downstream of the MD boundary. The 2012 imagery covers the entire mainstem channel within the MD and the 2014 imagery covers the entire mainstem channel within the MD with the exception of the 9.5 km section upstream of the Highwood River confluence and a 3 km section downstream of the MD boundary.

As described below, Pekisko Creek is a highly mobile stream channel, based on the historical aerial images.

- The only portion of the stream channel that didn't change markedly was the reach downstream of the Stimson Creek confluence up to the Highwood River confluence.
- Significant channel movement has occurred within a treed floodplain area upstream of the Stimson confluence. There are several sections of channel that shift between 1948 and 2012 and again between 2012 and 2014. There are several sections of creek where new channels have formed which have cut off the old channel from flowing.
- The most active reach of creek can be seen in the 9 km upstream of the HWY-22 crossing that includes the Bar U Ranch.
- In some cases, Pekisko Creek channel changes due to the 2013 flood were of a greater scale than those seen between 1948 and 2012. An example of this can be found in the NE 24-16-4-W5, where the channel shows some movement between 1948 and 2012 but completely changes path between 2012 and 2014.

5.0 ISSUES IDENTIFIED BY MD AND OTHER INFORMATION

- Post 2013 Flood MD Site Assessment (MD 2014) – Sonnet Residence – NW 25- 17- 2- W5 (further information required).
- Post 2013 Flood Bridge Damages (MD 2014):
  - Pekisko Creek:
    - BF 01126 – 642 Ave W – damages have been repaired
    - BF 75732 – 160 St W – destroyed bridge has been removed
    - BF 01970 – 2698 Dr W – damages have been repaired
  - Stimson Creek:
    - BF 01308 – HWY-540 – damages have been repaired (Post Flood Inspection)
    - BF 77700 – 786 Ave W – damages have been repaired
    - BF 73389 – HWY-22 – damages reported (Post Flood Inspection)
- Post 2013 Flood Road Damages (MD 2014) – 2698 Dr W from the Bar-U Ranch to 200 St. W (includes the crossing of Pekisko Creek) – Road washed out and ditches full of silt.
- Eleven Riparian Health Assessments (SALT 2011) were completed for the Hanen Property on Pekisko Creek (27, 28, & 34-16-3-W5). Each site included riparian area for approximately 250 m of streambank. Nine of the 11 sites (82%) scored higher than 80% and were deemed "Healthy". The remaining two sites scored 78% and were categorized as "Healthy but with Problems". Categories that in general saw lower scores were in vegetative cover, browse utilization, and streambank root mass protection. See pages 143 to 150 and Appendices D and E from the Southern Alberta Land Trust Pekisko Valley Study (SALT 2011) for more detail.

- Issues associated with Ranching (primary use of land) – cattle grazing and watering has significant impacts on riparian vegetation and bank integrity. Grazing prevents naturally occurring plants from growing and other vegetation from reaching full growth potentials. As a result, bank integrity is compromised due to the lack of supporting root structure. Both riparian vegetation and bank integrity are also impacted by the movement of cattle over the land which also reduces riparian vegetation growth ability.

5.1 Aquatic Resources

- Pekisko Creek has historically been identified as a valuable fish stream (SALT 2011 pg. 84-91); and
- Pekisko Creek is a Class C stream that has moderately sensitive fish habitat areas. It also supports sport fishing with confirmation of all life stages of Bull (Salvelinus Confluentus), Cutthroat (Oncorhynchus Clarki), Rainbow Trout (O. Mykiss), and Mountain Whitefish (Prosopium Williamsoni). (AMEC 2001).

5.2 Chain Lakes North Dam

As previously discussed, the north portion of the Chain Lakes Reservoir is located within the Stimson Creek watershed. Therefore it is important to understand the impacts of a potential failure of the North Dam. In 2003, Northwest Hydraulic Consultants (NHC) modeled and reviewed various North Dam failure scenarios. The following is an excerpt from the final report (NHC 2013) submitted by NHC summarizing the worst case scenario.

> An overtopping failure during the Probable Maximum Flood (PMF) is estimated to result in a peak discharge immediately below the dam of 2100 m3/s. Impacted in the first 36 km below the dam (the reach subject to detailed analysis) would be four permanent residences, two summer cabins, farm buildings, several bridges and farmland in the creek valley. The leading edge of the flood wave would arrive at the first of the impacted residences in 2.7 to 3.0 hours after the initiation of the dam failure and peak in another 1.0 hours. Due to large tributary inflows and little floodplain storage, the flood wave does not attenuate as it moves downstream but rather increases in magnitude such that by the time the flood wave reaches a point just upstream from the Highwood River, the peak flow has increased to 2800 m3/s.
>
> An approximate analysis extends the work some 15 km down the Highwood River to a point about 8 km above the Town of High River. The flood wave reaches this point from 4.4 to 4.9 hours after initiation of dam failure, reaching a peak flow of about 3000 m3/s some 6.3 hours after initiation of dam failure. A flow of this magnitude would result in significant breakout of flows from the Highwood River and cause severe flooding in and around the Town of High River.

NHC also recommended the creation of an Emergency Preparedness Plan (EPP) due to the severity of these impacts. The other failure scenario that NHC looked into was a piping dam failure, this would result in peak flows equivalent to a 50 year return period flood at High River (NHC 2003).

6.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions are based on the desktop review contained herein:

- Pekisko Creek and Stimson Creek are similar sized watersheds and are significant tributaries to the Highwood River. On a drainage area basis, both streams combined represent about 28.6% of the Highwood River watershed (measured at the confluence with Pekisko Creek);
- The headwaters of both streams are located in Rocky Mountains between the Highwood and Livingstone Ranges. Compared to Stimson Creek, the Pekisko Creek mainstem channel length is 14 km longer and headwater elevation is approximately 450 m higher;
- Pekisko Creek is a very mobile creek in the upper and middle portions of the watershed, whereas Stimson Creek in comparison is relatively stable. The majority of both watersheds are located within the MD of Foothills and the primary land use is ranching, that is either located on deeded or crown leased land. The infrastructure located in proximity to the stream channels is relatively restricted and consists of road and pipeline crossings and the North Chain Lakes Dam. This in-part explains the relatively few 2013 flood issues documented in these watersheds. Following the 2013 flood, there was only one residence that was assessed for flood damages and 6 bridges that were damaged. Other infrastructure found along the creeks includes three or more push-up dams; and
- Three potential reservoirs have been identified between the two creeks, but no further action has occurred.

The following recommendations are based on this study.

- No issues or data gaps were identified on Peksiko and Stimson Creeks that would have a significant impact on the Highwood River downstream of the confluence with Pekisko Creek; and
- There are several push-up dams located within the Pekisko and Stimson watersheds. The performance of these structures during the 2013 flood is uncertain. However, it appears there were no significant issues related to push-up dams resulting from the 2013 flood. There may be some merit to further evaluate these structures to determine impacts resulting from a failure.

Yours truly,

Amec Foster Wheeler Environment & Infrastructure
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SW/GC/LSH/bm

Attach.

Permit to Practice No. P-4546

7.0 REFERENCES

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AECOM, 2014. Appendix P: Hydrological Modelling. 9 July, 2014. (AECOM-P 2014)

AMEC, 2001. Pekisko Creek Pipeline Exposure Assessment SE 33-17-02 W5M. 15 March 2001. (AMEC 2001)

Environment Canada. (n.d.). Water Survey of Canada Hydrometric Data. Retrieved June, 2015, from Water Survey of Canada website: https://wateroffice.ec.gc.ca/search/search_e.html?sType=h2oArc (EnvCan 2015)

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Northwest Hydraulic Consultants, 2003. Chain Lakes North Dam: Dam Breach Inundation Study Final Report. March 2003. (NHC 2003)

Southern Alberta Land Trust, 2011. Pekisko Valley Study. October 2011. Downloaded from http://www.salts-landtrust.org/docs/research/pekisko_valley_study_final.pdf (SALT 2011)

Figures

RGE 4 | RGE 3 | RGE 3 | RGE 2 W5

TWP 18

TWP 17

TWP 16

TWP 15

TWP 14

541

22

540

532

Highwood River

Creek

Bull Creek

Eden Valley 216

Eden Valley 216

Highwood

Emerson Creek

Foothills No. 31

Willow Creek No. 26

Pekisko Creek

Beaver Creek

Sheppard Creek

Stimson Creek

Hay Creek

Willow Creek

Kananaskis Improvement District

Ranchland No. 66

Chain Lakes Reservoir

10+000

3+700

20+000

30+000

40+000

10+000

20+000

30+000

1,000 0 1,000 2,000 N

Metres

1:100,000

Legend

- Municipal District / Improvement District
- Indian Reserve
- Park or Protected Area
- Watershed Boundary
- 10 Contour Interval
- 50m Contour Interval
- Pekisko and Stimson Creek
- Pekisko Creek Channel Distance in km Upstream of Highwood River Confluence
- Stimson Creek Channel Distance in km Upstream of Highwood River Confluence

Stations Along Pekisko and Stimson Creeks

MD of Foothills No. 31

Scoping Study

Figure 1

DATE:	PROJECT:
July 2015	CW216703

Pekisko and Stimson Creek Stations
15-07-08

amec foster wheeler

Projection: 10TM Zone NAD83
Source: GeoBase®, Spatial Data Warehouse Ltd.,

S:\Gis\Projects\CW\216703\ArcGIS\Pekisko and Stimson Creek Stations.mxd Analyst: nicholas.hauk

*PLOT 1:1=B (L)

610 AVE.
626 AVE.
642 AVE.
658 AVE.
674 AVE.
690 AVE.
706 AVE.
722 AVE.
738 AVE.
754 AVE.
770 AVE.
786 AVE.
802 AVE.
818 AVE.

Township 17

Township 16

Eden Valley IR No 216

Eden Valley IR No 216

BAR U RANCH

540

22

HOGG PARK

128 ST.W.
112 ST.W.
96 ST.W.
80 ST.W.
64 ST.W.

272 ST.W.
256 ST.W.
240 ST.W.
224 ST.W.
208 ST.W.
192 ST.W.
176 ST.W.
160 ST.W.
144 ST.W.

Range 4
Range 3
Range 2

Municipal District of Willow Creek No. 26

LEGEND

- Towns
- Hamlets
- Indian Reserves
- Grazing Lease(Crown Land)
- Special Areas
- Councillor's Divisional Boundaries (2010)

Roads and Surfaces

- Provincial Highway
- Paved Road
- Oiled Road
- Gravel Road
- Dust Control
- Railway

SCALE
1:100 000
0 1 2 km

IMAGE REFERENCE: M.D. OF FOOTHILLS NO. 31 2012 MUNICIPAL MAP

amec foster wheeler

CLIENT: MD OF FOOTHILLS NO. 31

PROJECT: FOOTHILLS SCOPING STUDY

TITLE: PROPERTY BOUNDARIES AND OWNERSHIP

DATE:	JOB No.:	CAD FILE:	FIGURE No.:	REV.
JULY 2015	CW216703	2167-N05.dwg	FIGURE 2	A

I:\CW\2167\2167-N05.dwg - FIGURE 2 - Jul. 06, 2015 4:38pm - corey.ferneets

Figure 3:

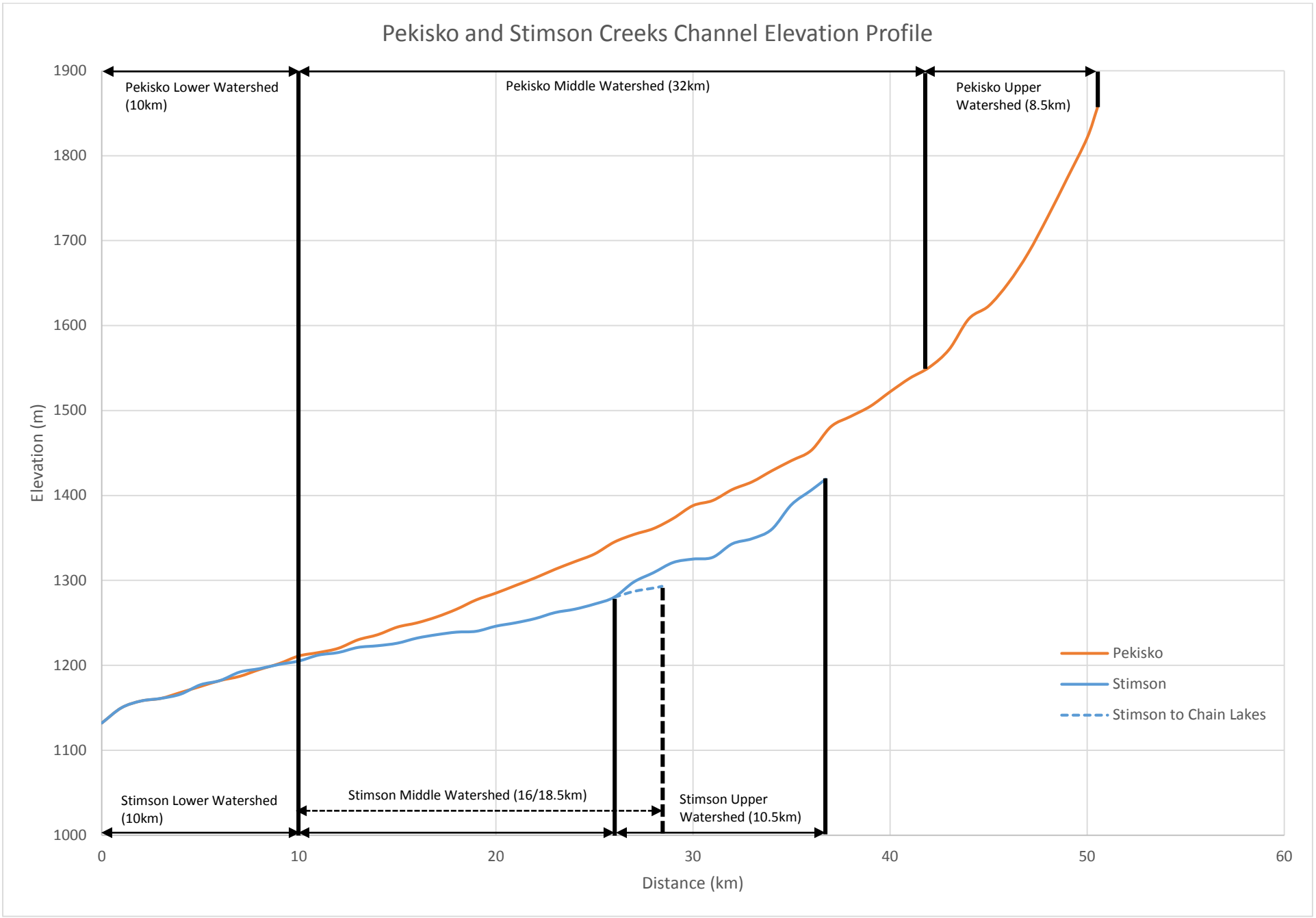
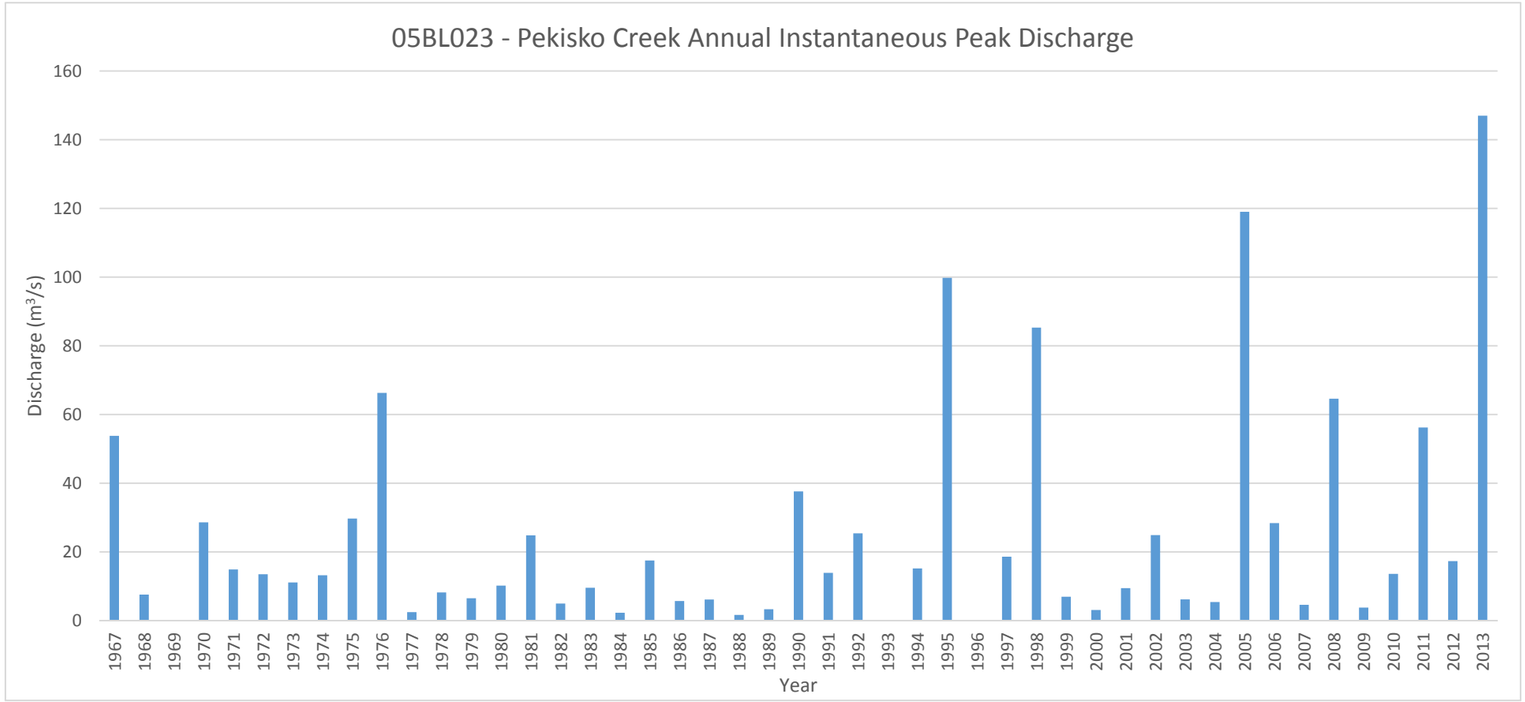

Pekisko and Stimson Creeks Channel Elevation Profile
Pekisko Lower Watershed (10km)
Pekisko Middle Watershed (32km)
Pekisko Upper Watershed (8.5km)
Stimson Lower Watershed (10km)
Stimson Middle Watershed (16/18.5km)
Stimson Upper Watershed (10.5km)
Pekisko
Stimson
Stimson to Chain Lakes
Elevation (m)
Distance (km)
1900
1800
1700
1600
1500
1400
1300
1200
1100
1000
0
10
20
30
40
50
60

Figure 4:


05BL023 - Pekisko Creek Annual Instantaneous Peak Discharge
Discharge (m³/s)
Year
0
20
40
60
80
100
120
140
160
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
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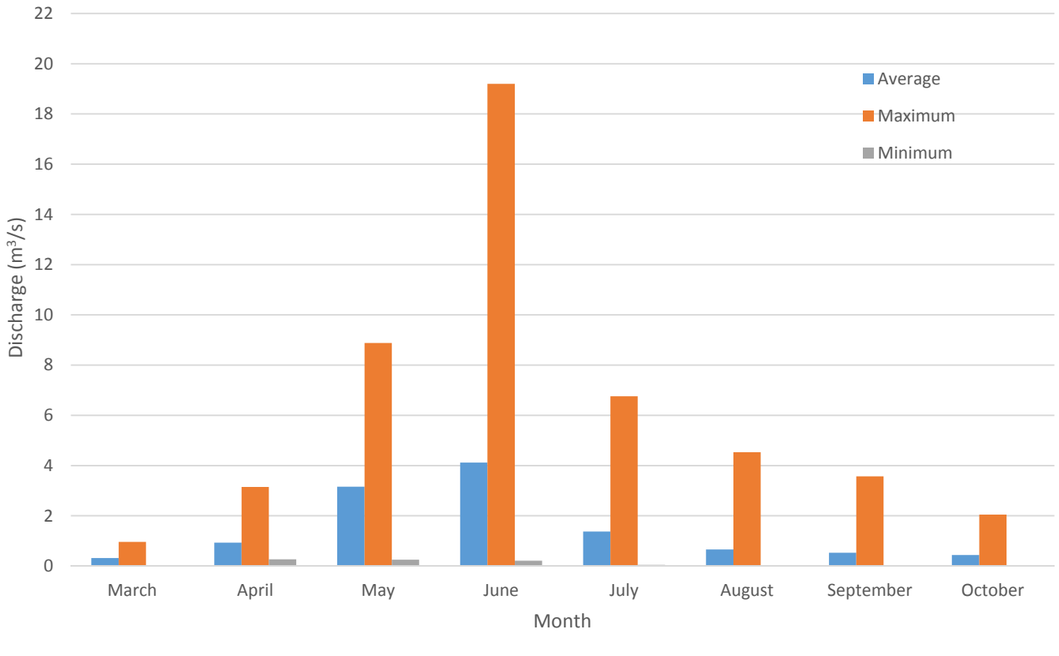
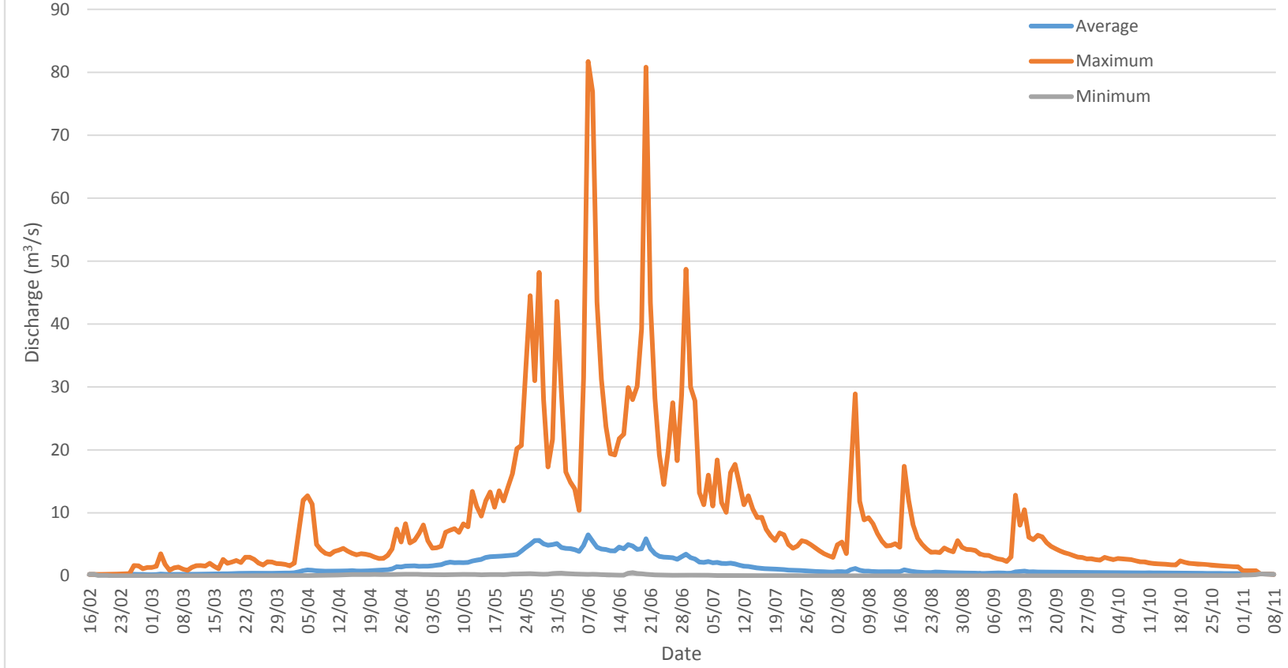
2010
2011
2012
2013


Mean, Minimum, Maximum Monthly Discharge (1967-2013)
05BL023 - Pekisko Creek
Discharge (m³/s)
Month
Average
Maximum
Minimum
0
2
4
6
8
10
12
14
16
18
20
22
March
April
May
June
July
August
September
October


Mean, Maximum, and Minimum Daily Dishcharge (1967-2013)
05BL023 - Pekisko Creek
Discharge (m³/s)
Date
Average
Maximum
Minimum
0
10
20
30
40
50
60
70
80
90
16/02
23/02
01/03
08/03
15/03
22/03
29/03
05/04
12/04
19/04
26/04
03/05
10/05
17/05
24/05
31/05
07/06
14/06
21/06
28/06
05/07
12/07
19/07
26/07
02/08
09/08
16/08
23/08
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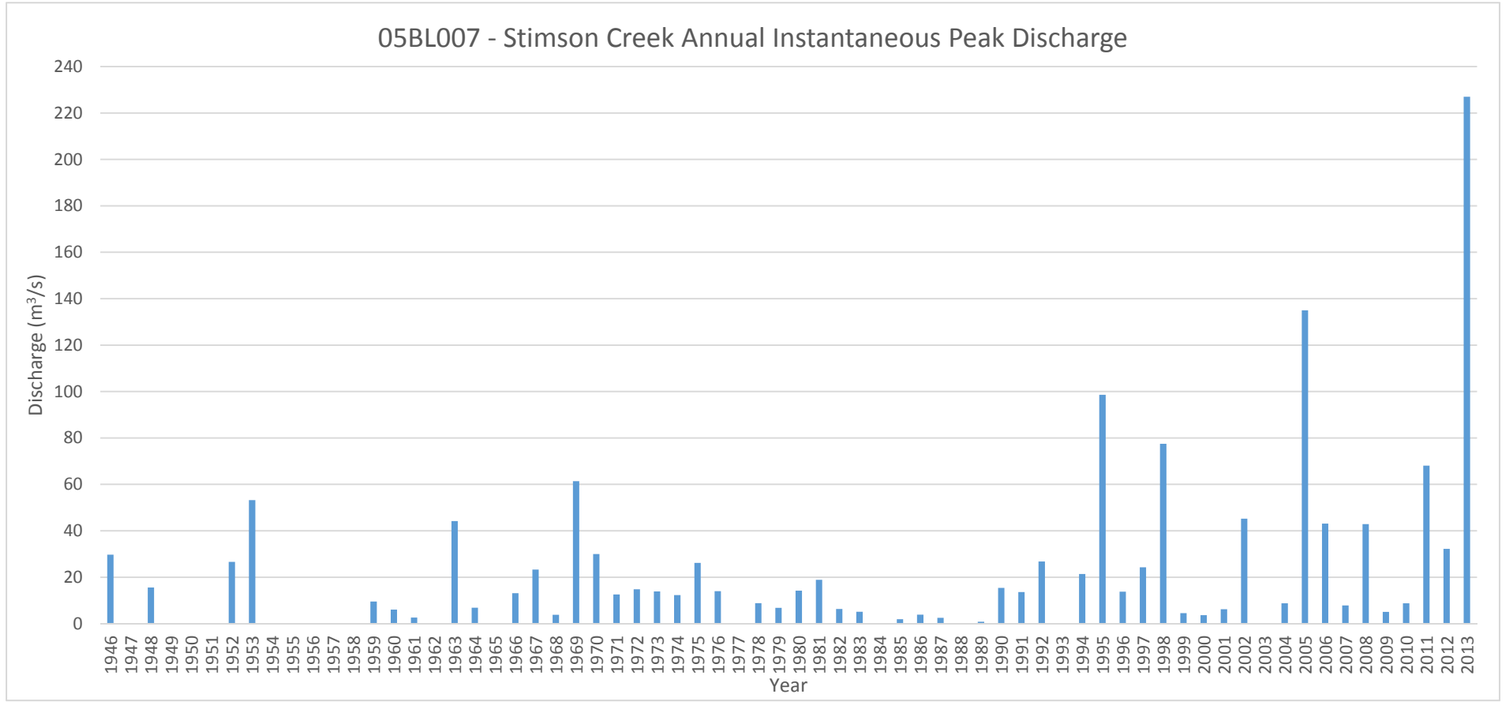
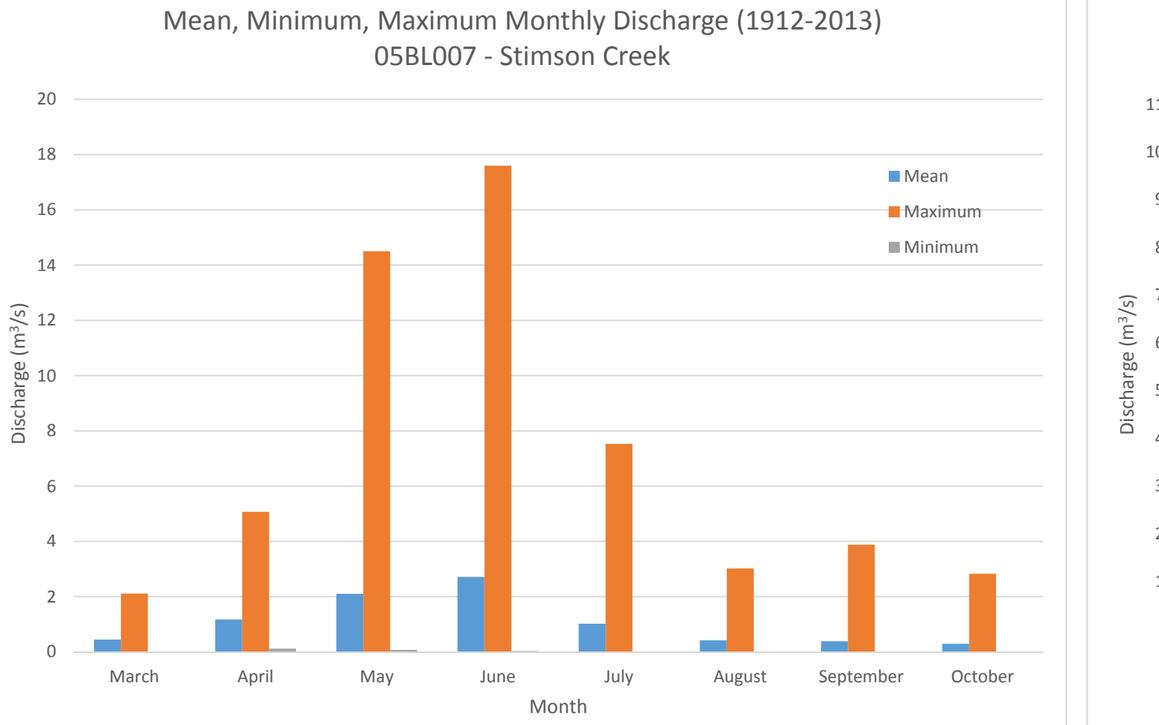
25/10
01/11
08/11

Figure 5:


05BL007 - Stimson Creek Annual Instantaneous Peak Discharge
Discharge (m³/s)
Year


Mean, Minimum, Maximum Monthly Discharge (1912-2013)
05BL007 - Stimson Creek
Discharge (m³/s)
Mean
Maximum
Minimum
March
April
May
June
July
August
September
October
Month

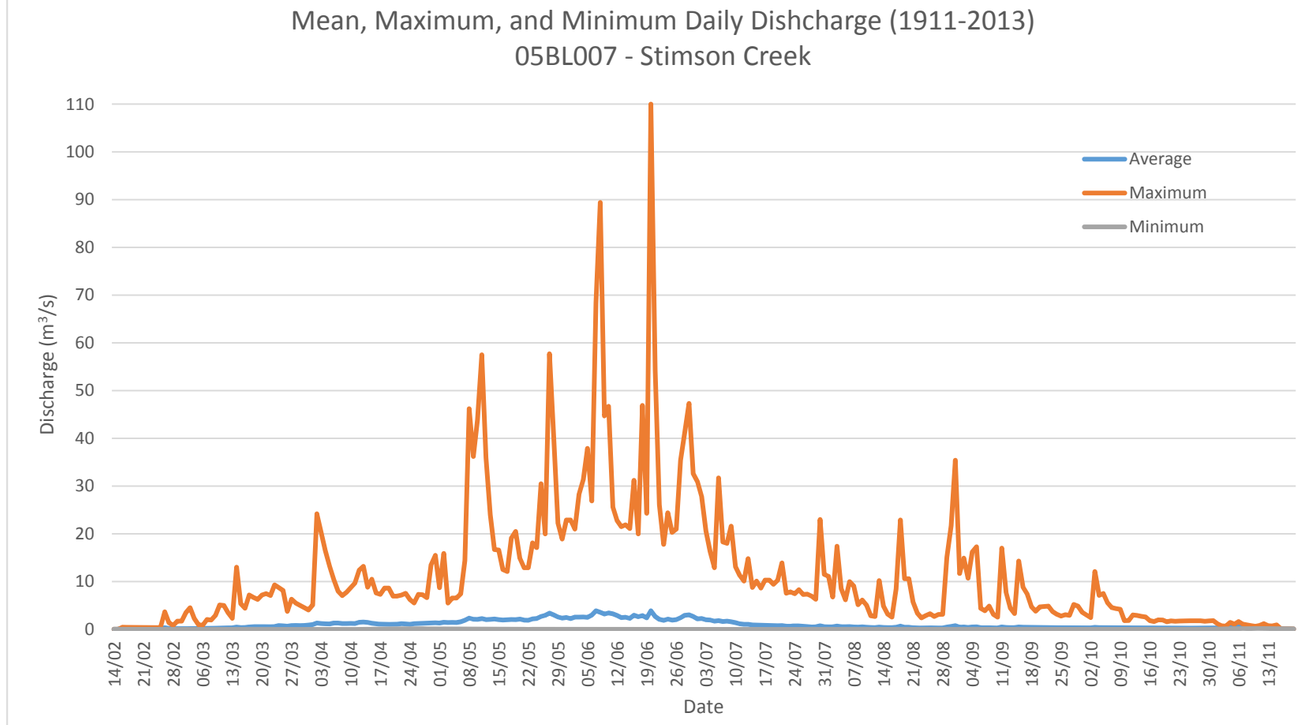
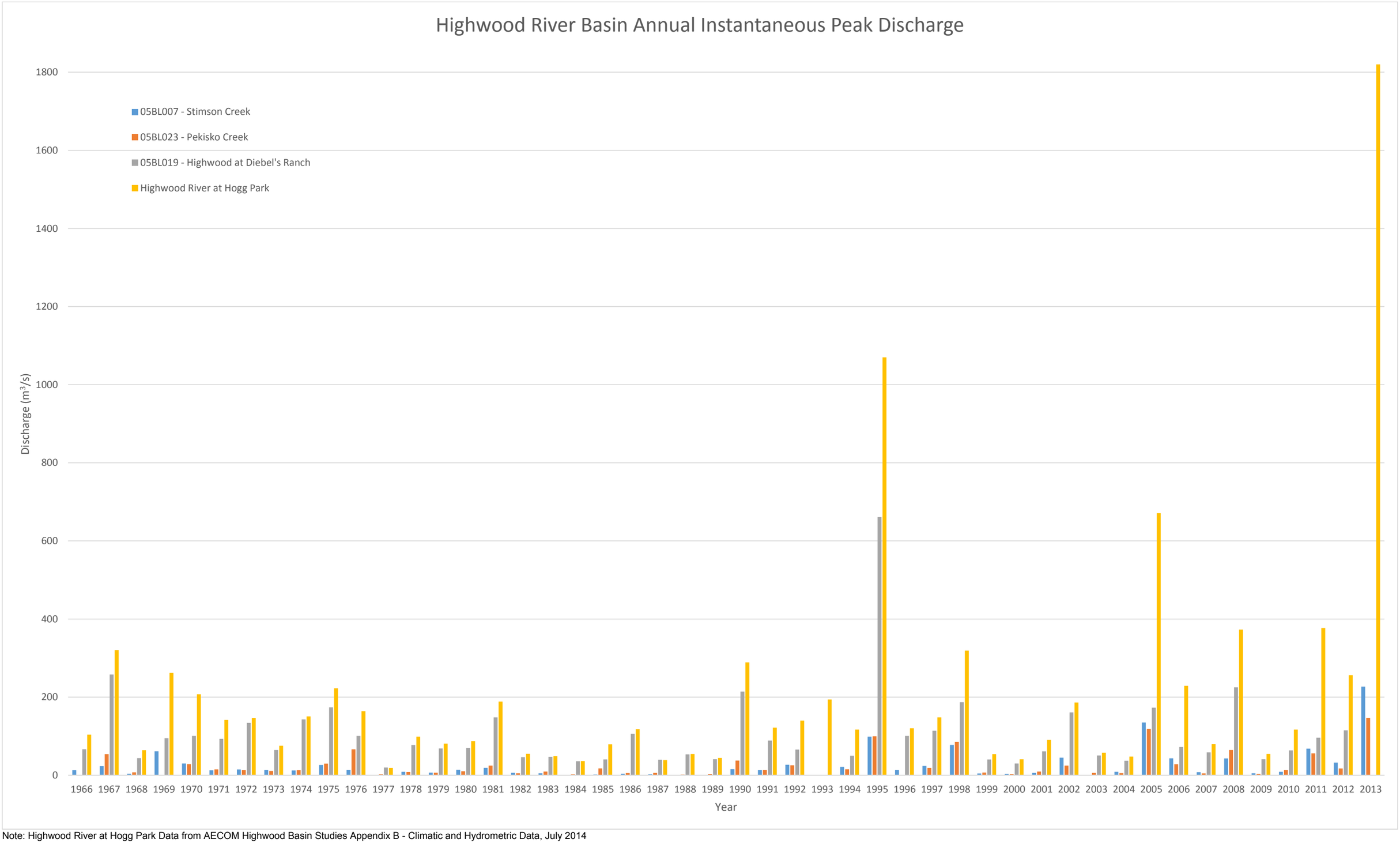

Mean, Maximum, and Minimum Daily Dishcharge (1911-2013)
05BL007 - Stimson Creek
Discharge (m³/s)
Average
Maximum
Minimum
Date

Figure 6:



Note: Highwood River at Hogg Park Data from AECOM Highwood Basin Studies Appendix B - Climatic and Hydrometric Data, July 2014

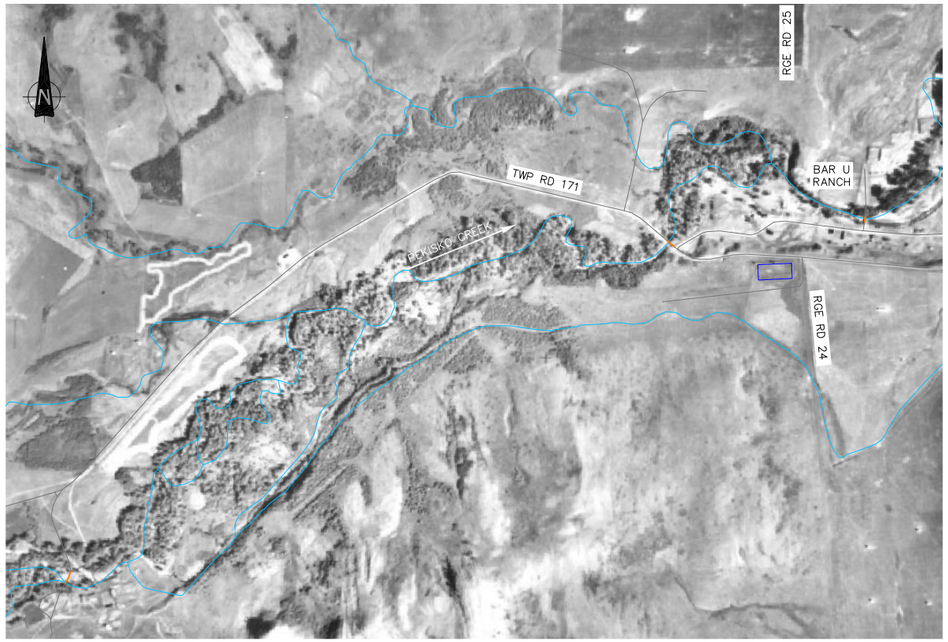


PHOTO 1: PEKISKO CREEK 1948
SCALE 1:10000

IMAGE REFERENCE: NATIONAL AIRPHOTO LIBRARY, 1948

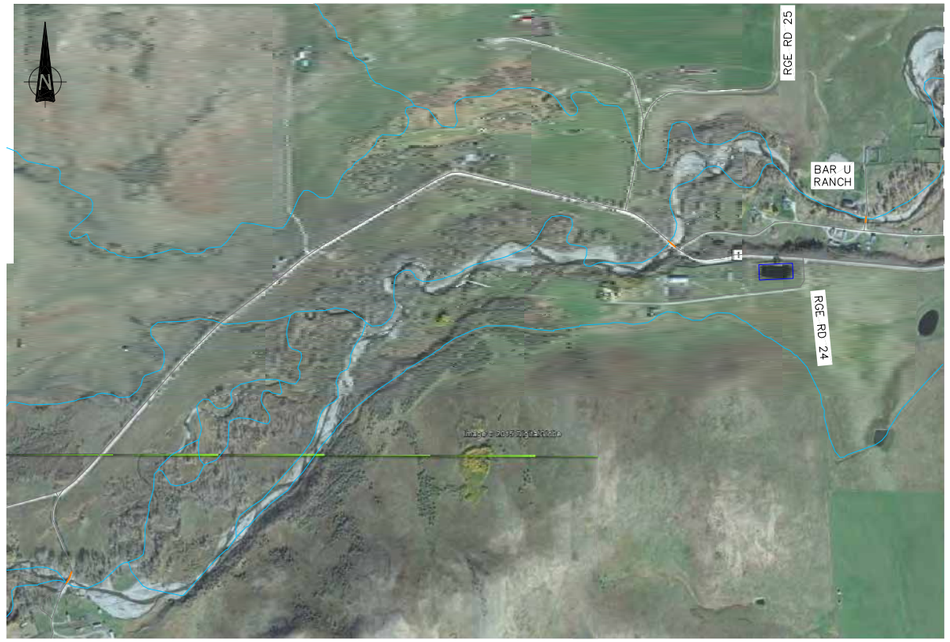


PHOTO 2: PEKISKO CREEK 2014
SCALE 1:10000

IMAGE REFERENCE: GOOGLE EARTH, 2014

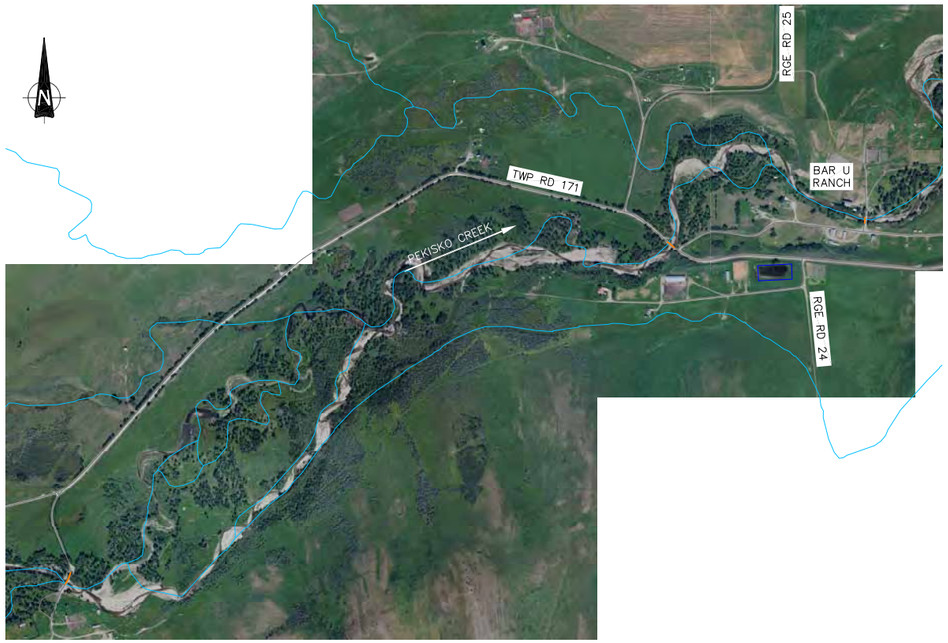


PHOTO 2: PEKISKO CREEK 2012
SCALE 1:10000

IMAGE REFERENCE: M.D. OF FOOTHILLS NO. 31, 2012

SCALE
1:10 000
0 100 200m

THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED (i.e. 1:1000 etc.) ARE BASED ON 22" X 34" FORMAT DRAWINGS

amec foster wheeler

CLIENT:
M.D.OF FOOTHILLS NO. 31

PROJECT: **DESKTOP REVIEW OF FLOOD ISSUES ON PEKISKO AND STIMSON CREEK**

TITLE: **COMPARATIVE AIR PHOTOS OF PEKISKO CREEK**

DATE:	JOB No.:	CAD FILE:	FIGURE No.:	REV.
JULY 2015	CW216703	216703-F03.dwg	FIGURE 7	A

*PLOT 1:1=B (L)

I:\CW\216703\216703-F03.dwg — Figure 7 — Jul. 23, 2015 11:39am — corey.fernets

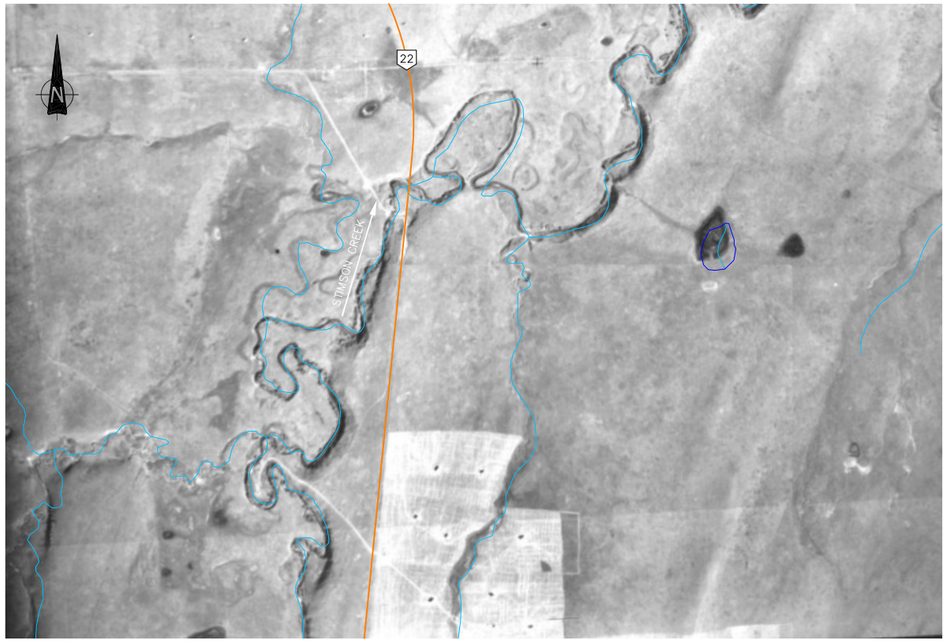


PHOTO 1: STIMSON CREEK 1948
SCALE 1:10000

IMAGE REFERENCE: NATIONAL AIRPHOTO LIBRARY, 1948

PHOTO 2: STIMSON CREEK 2014
SCALE 1:10000

IMAGE REFERENCE: GOOGLE EARTH, 2014

PHOTO 2: STIMSON CREEK 2012
SCALE 1:10000

IMAGE REFERENCE: M.D. OF FOOTHILLS NO. 31, 2012

SCALE
1:10 000
0 100 200m

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DATE:	JOB No.:	CAD FILE:	FIGURE No.:	REV.
JULY 2015	CW216703	2167-F04.dwg	FIGURE 8	A