F5 Stream Reach Summary

Study Reach: F5, Fraser River - Town of Fraser at Meadow Ridge Road downstream to the Consolidated Wastewater Treatment facility downstream of County Road 8.

Reach Description: Approximate channel length: 1 ¼ miles, approximate channel slope 1.1%.

This short reach begins in the Town of Fraser at Meadow Ridge Road and extends through Town to the Consolidated Treatment Plant approximately ¾ mile downstream of County Road 8. The upstream ½ mile through town is relatively confined with development encroaching on the overbanks. Downstream of County Road 8 the overbanks are undeveloped, unconfined and well vegetated with shrubs and willows. Elk Creek and St. Louis River both confluence with the Fraser River upstream of County Road 8. The Hammond ditch is also in this reach, located immediately downstream of County Road 8.

Fraser River Culverts at South Wapiti Drive

Fraser River in the Town of Fraser

Flow Recommendations:

***Environmental Flow Methodology*:** A study site was not established within this reach. Only CWCB flow recommendations are available.

Water Users:

- Irrigators, municipalities and industry flow-related issues: The Hammond Ditch is located in F5, immediately downstream of County Road 8. This Ditch has recently been acquired by Grand County.
- Recreational flows: Angling is the predominant recreational use. Float boating is possible in F5, however, not common due to low flows and limited accessibility.

Summary of Flows:

CWCB flows

- 17 cfs summer (05/15 – 09/15)
- 11 cfs for winter (09/16 – 5/14)

Water Users

- Irrigators, municipalities and industry: The local diversions in this reach could potentially divert up to approximately 5 cfs at anytime.
- Recreational flows: Angling:60-200 cfs

Stream Assessments: In August 2008 Tetra Tech conducted two stream assessments in F5. These included Stream Reach Inventory/Channel Stability Evaluation (SRI/CSE), and the EPA Habitat Quality Assessment (HQA). The SRI/CSE evaluation scored in the 'good" category and the EPA HQA evaluation scored in the 'suboptimal" range. Overall, the stream assessments did not reveal any issues of significant concern. Results of both assessments are summarized in the following table. Details and methodology are presented in Appendix A.

Reach F5 Stream Assessments					
Stream Reach Inventory/Channel Stability Evaluation			**EPA Habitat Quality Assessment**		
Attribute			**Attribute**		**Score**
Upper Banks			**Channel**		
1	Landform Slope	2	1	Aquatic Habitat Barriers/ Diversion	17
2	Mass wasting hazard	3	2	Aquatic Structure as Cover	17
3	Debris Jam Potential	4	3	Velocity/ Depth Regimes	19
4	Vegetation Cover	7	4	Channel Flow Status	16
	Upper Bank Score:	**16**	5	Channel Alteration	15
Lower Banks			6	Frequency of Riffles	17
5	Channel Capacity	2	7	Channel Sinuosity	10
6	Bank Rock Content	5		**Channel Score**	**111**
7	Flow obstructors & Deflectors	3	**Banks**		
8	Cutting	4	8	Bank Stability	18
9	Deposition	6	9	Riparian Vegetation Cover and Disturbance	14
	Lower Bank Score:	**20**	10	Riparian Vegetation zone width	10
Channel Bottom				**Bank Score**	42
10	Rock Angularity	2		**Total Score**	**153**
11	Brightness	2	**Notes**		
12	Consolidation/Particle Packing	4			
13	Bottom size distribution	6			
14	Bed Scour and Deposition	8			
15	Clinging Aquatic Veg	2			
	Channel Bottom Score:	**24**			
	Total Score:	**60**			

Spawning Observations: A trout spawning survey was conducted throughout F5, on October 28, 2008. Four likely brown trout redds were identified and measured.

Hydrologic Records: No streamflow records are available for this reach.

Water Temperature: F5 is a Tier II stream reach as designated by CDPHE with a chronic temperature standard of 18.2°C MWAT and an acute temperature standard of 23.8°C DM. Temperature data reviewed for reach F5 are generally below standards. However, some exceedences have occurred and resulted in placement of F5 (below Hammond Ditch) on the 303 (d) list of impaired waters for temperature, with a low priority.

Water Quality: Ammonia values exceeded standard values in the early nineties; however, a new consolidated wastewater treatment plant went on line in the early 2000s, which includes ammonia treatment. As of April 2010 this reach of the Fraser River has been placed by the State of Colorado on the 303(d) list for monitoring and evaluation for copper. The upstream end of the listed river segment is bound by the Hammond Ditch.

Water Supply Issues (UPCO): UPCO reports that flows in this reach are generally adequate under current conditions, with occasional shortages under future conditions. Grand County recently purchased water rights in Hammond Ditch, located on the downstream end of this reach, with the goal to use the water to improve low flow conditions.

Summary of Results and Additional Remarks:

1. No streamflow records are available for this reach. However, daily streamflow exceedence plots for F3 indicate the CWCB flow recommendations have been commonly equaled or exceeded throughout much of the entire period-of-record. The environmental flows recommended for upstream reaches should be supportive of the Fraser River through reach F5.
2. Temperatures and water quality appear supportive of a cold-water fishery.
3. Flows for water users including recreation are generally adequate.
4. 2007 electrofishing data collected by GEI Consultants indicate brown, brook, and rainbow trout occur within this reach, comprising 54, 24, and 22 percent of the game fish catch, respectively (GEI 2007).
5. Flow rates in this reach could be impacted by a proposed pump-back plan which is contemplated to recapture Fraser River return flows below the Towns of Fraser and Winter Park. A reconnaissance-level study was completed by GEI in June 2005 addressing several alternatives and associated costs. Preliminary indications are that the pump-back plan could compensate for flow shortages, but the environmental impacts are yet unknown.
6. Review of future flow conditions as depicted by Denver Water's PACSM model indicates that the late summer flows, flushing flows and winter base flows, without flow enhancements or restoration, may be occasionally lower than target ranges in this reach.

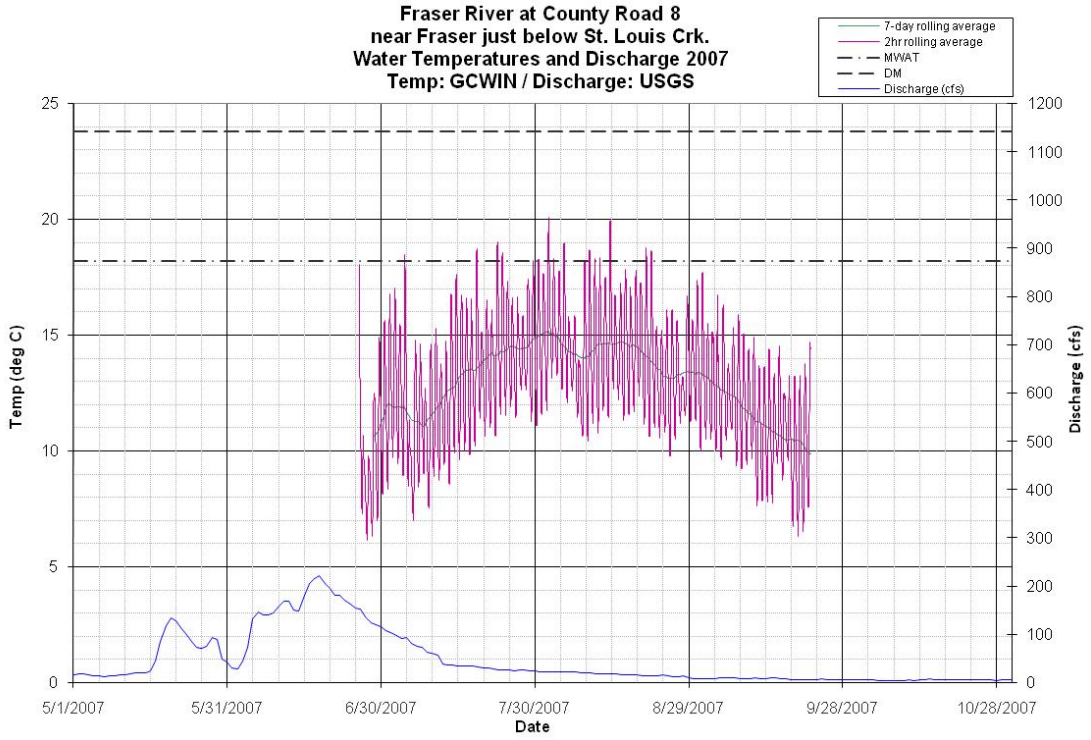
Restoration Opportunities: The proposed sediment pond, flushing flow recommendations and application of flow enhancements made for upstream reaches on the Fraser should provide direct benefits in F5 as well. Additional opportunities include the following:

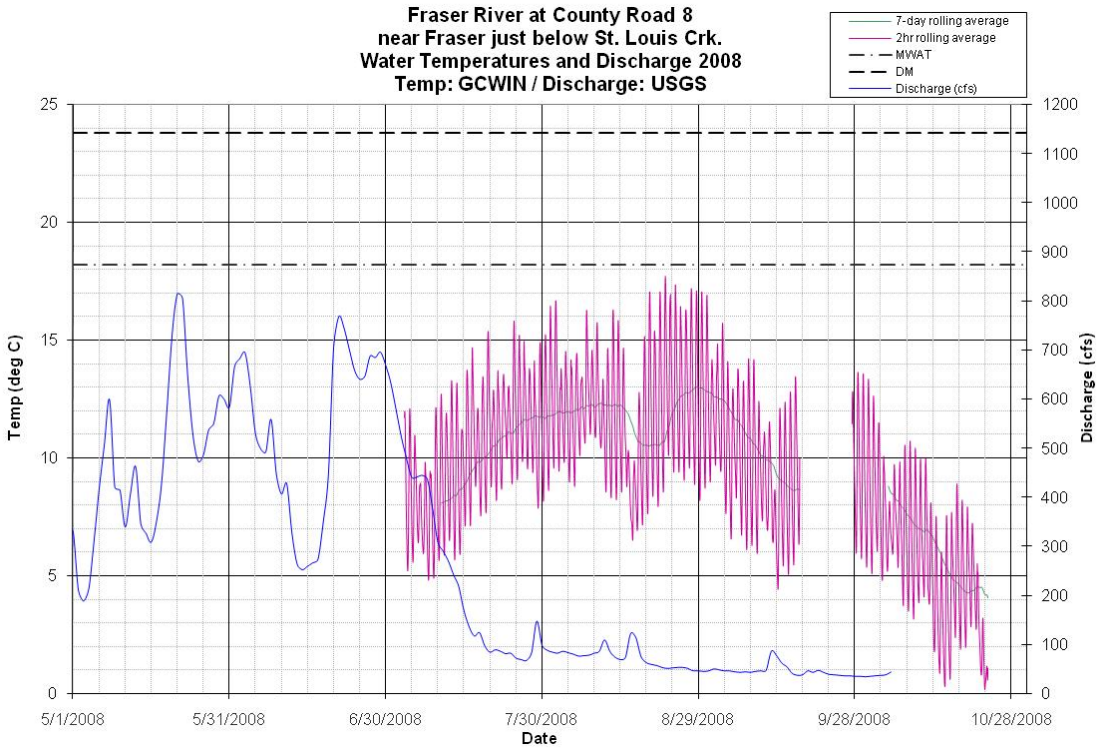
- ✓ Practice and enforce effective Best Management Practices (BMPs) associated with local construction for the control of sediment runoff.

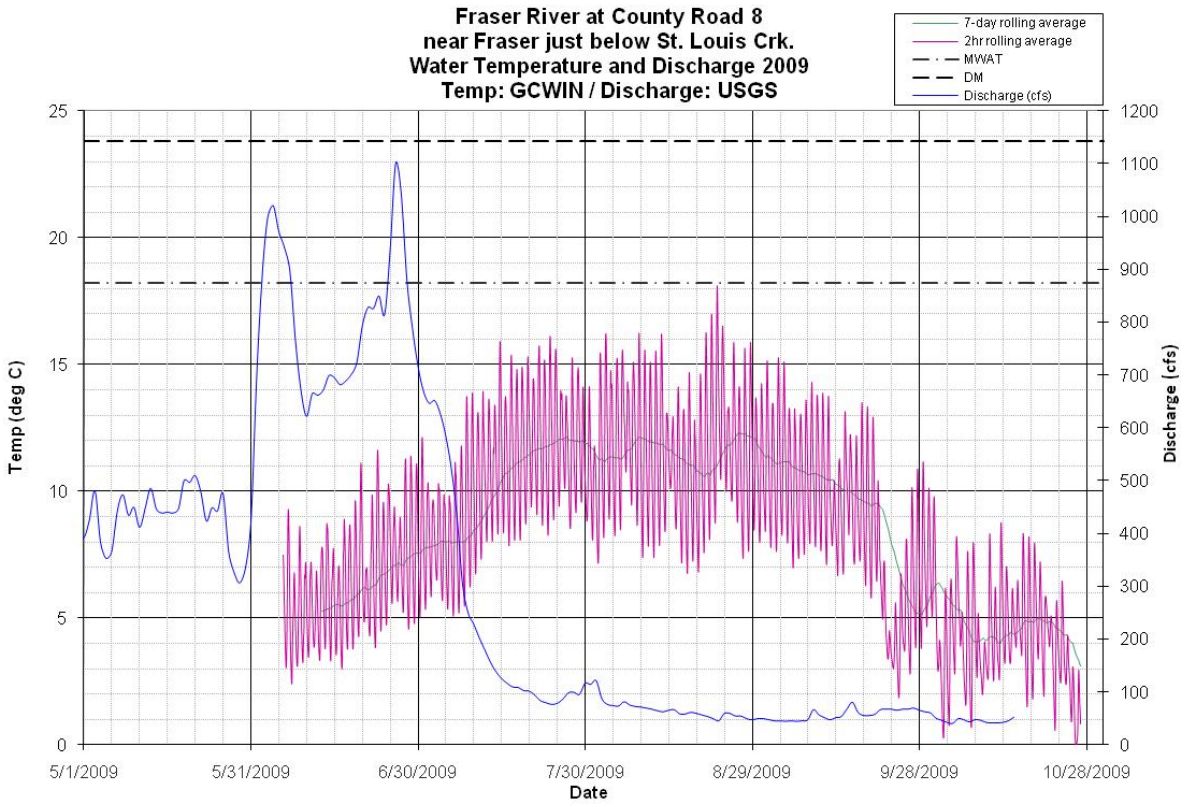
Monitoring: No recommendations are made at this time.

Support Data

Surface Water Temperature Plots






Fraser River at County Road 8
near Fraser just below St. Louis Crk.
Water Temperature and Discharge 2009
Temp: GCWIN / Discharge: USGS
7-day rolling average
2hr rolling average
MWAT
DM
Discharge (cfs)
Temp (deg C)
Discharge (cfs)
Date
5/1/2009
5/31/2009
6/30/2009
7/30/2009
8/29/2009
9/28/2009
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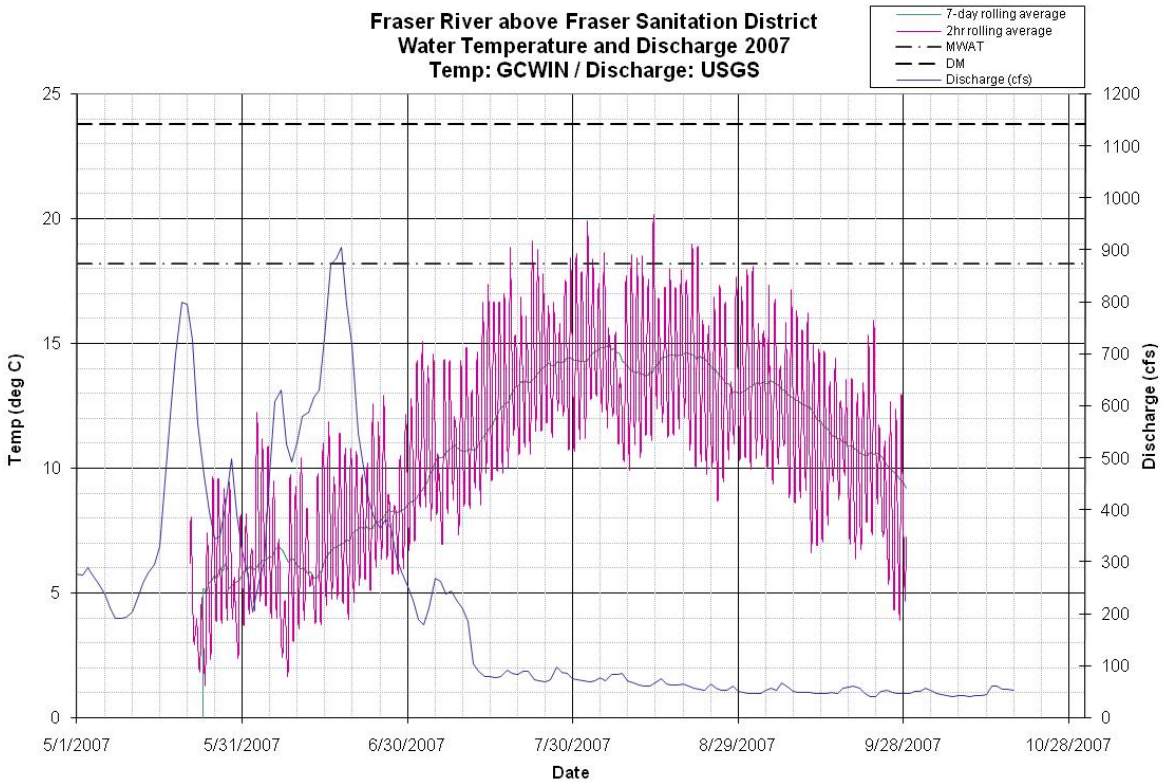
Fraser River above Fraser Sanitation District
Water Temperature and Discharge 2007
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7-day rolling average
2hr rolling average
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Discharge (cfs)
Temp (deg C)
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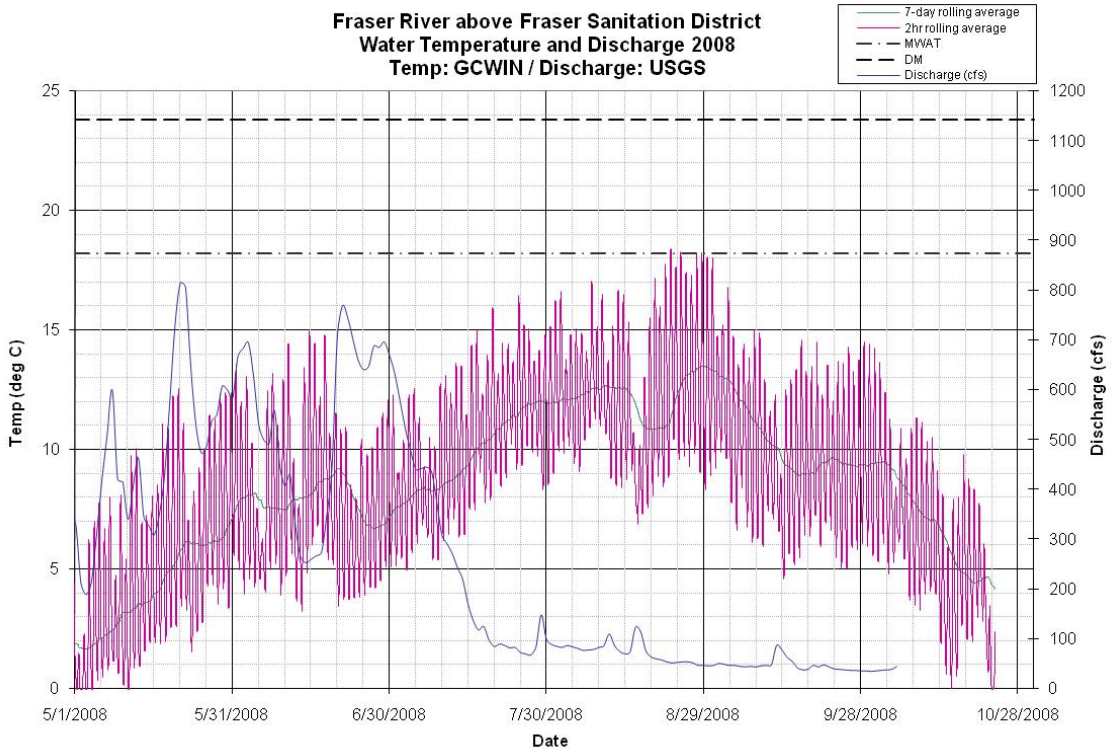
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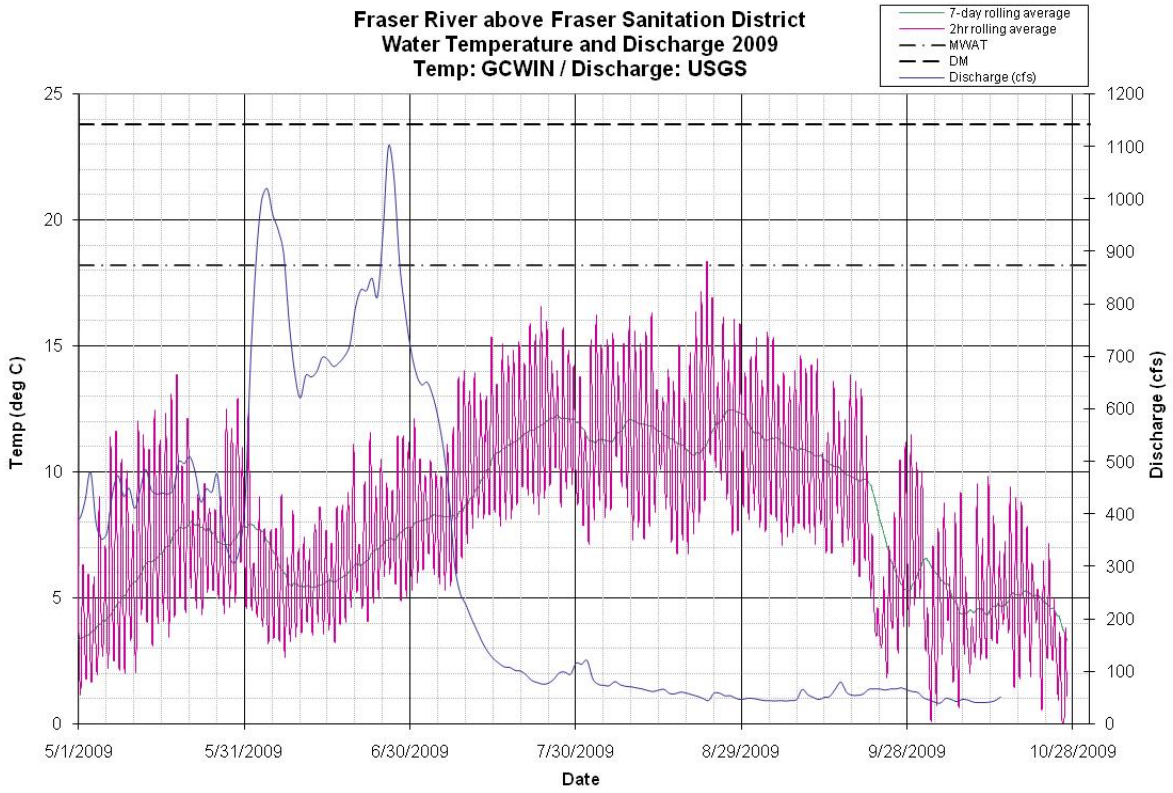
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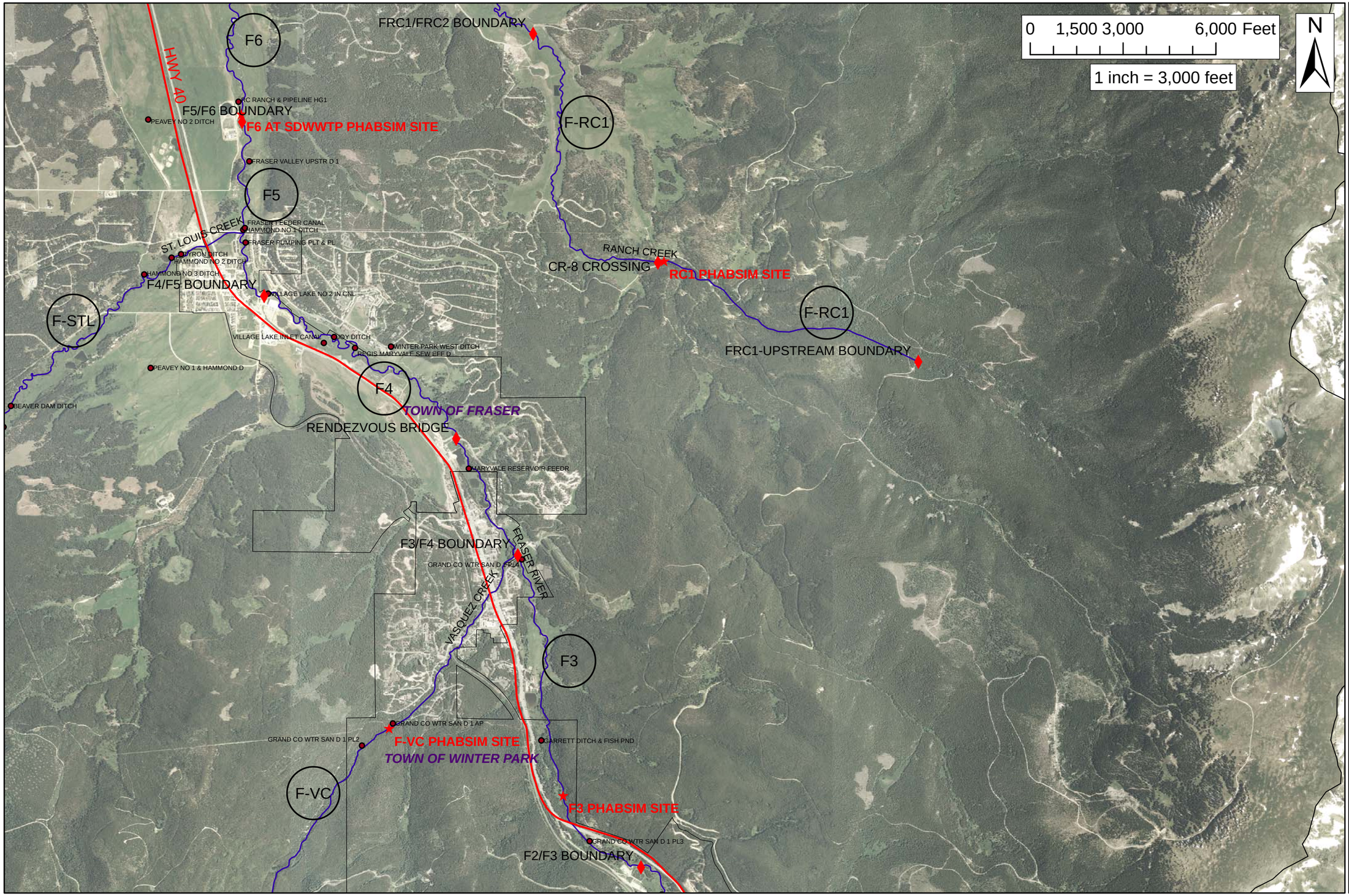

GRAND COUNTY STREAM MANAGEMENT PLAN REACHES

Legend

- REACH BOUNDARY
- PHABSIM SITES
- DIVERSIONS

REACH: F5

SHEET # :
1 OF 1

GRAND COUNTY Colorado · Est 1874

TETRA TECH