DOMAIN 13 AQUATIC INSTRUMENT SYSTEM (AIS) SITE CHARACTERIZATION REPORT

PREPARED BY	ORGANIZATION	DATE
Keli Goodman	AQU	08/1/2011
Stephanie Parker	AQU	10/21/2014
Jesse Vance	AQU	10/26/2015
Michael Fitzgerald	AQU	09/29/2015

APPROVALS (Name)	ORGANIZATION	APPROVAL DATE
Andrea Thorpe	SCI	11/13/2015
Dave Tazik	SCI	11/05/2015
Hanne Buur	PSE	11/05/2015

RELEASED BY (Name)	ORGANIZATION	RELEASE DATE
Jennifer DeNicholas	CM	11/20/2015

See Configuration Management System for approval history

Change Record

REVISION	DATE	ECO #	DESCRIPTION OF CHANGE
A	06/18/2015	ECO-01905	Initial Release
B	11/20/2015	ECO-03282	Update due to moving S1 and Met station sensor locations at COMO and moving entire AQU reach upstream at WSTL.

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1 DESCRIPTION

1.1 Purpose

Information collected and described here is used to inform the site design activities for the NEON project Aquatic Instrument System (AIS). This report includes information gathered by the Aquatic (AQU)/STREON (STR) and Environmental, Health, & Safety (EHS) teams. The purpose of this report is for the science team to outline what is desired at each site within a domain in order to obtain the best scientific data possible to help answer NEON's Grand Challenge Questions; therefore, this is not a design document, but a report that is an input to the design process.

This report takes precedence over other documents and reports that may repeat the information contained herein.

The Appendices include summary tables for the convenience of the multiple audiences of this report; some of the information in the tables is repeated from the body of this report while other information is exclusive to the summary tables.

1.2 Scope

AQU site characterization information presented in this document is for the Domain 13 aquatic locations: Como Creek (core), West St. Louis Creek (relocatable). Issues and concerns for each site that need further review are also addressed in this document according to our best knowledge. Unless otherwise noted, the information contained herein takes precedence over the same information repeated elsewhere; thereby, this document contains the official change-controlled information pertinent to these sites.

Disclaimer: All latitude and longitude coordinates are subject to the variation inherent in our GPS equipment and the conditions at the site. Some of the Aquatic sites are in narrow canyons with limited satellite coverage; resulting in coordinates that are not accurate to within 50 cm.

2 RELATED DOCUMENTS AND ACRONYMS

2.1 Applicable Documents

AD[01]	
AD[02]	
AD[03]	
AD[04]	

2.2 Reference Documents

RD[01]	NEON.NPR.000008 NEON Acronym List
RD[02]	NEON.NPR.000243 NEON Glossary of Terms
RD[03]	[Reference to photos]
RD[04]	[Reference to map(s)]

2.3 Verb Convention

"Shall" is used whenever a specification expresses a provision that is binding. The verbs "should" and "may" express non-mandatory provisions. "Will" is used to express a declaration of purpose on the part of the design activity.

3 DOMAIN 13 AIS SITE CHARACTERIZATION REPORT

3.1 Como Creek

The Como Creek site is a wadeable stream. It is a high-elevation mountain stream at ~10,000 ft in elevation, just east of the Continental Divide. The site has remained relatively undisturbed for the past 50 years, with no development, logging or fire in the watershed. Snowmelt dominates the hydrologic and nutrient flux in this system.

3.1.1 Aquatic Auxiliary and Aquatic Portal Locations for Construction

The initial estimated location for the Aquatic Auxiliary Portal is:

Table 1 Aquatic Auxiliary Portal Location

Aquatic Auxiliary Portal	Latitude	Longitude
Location	40.036084	-105.543574

The initial estimated location for the Aquatic Portal is:

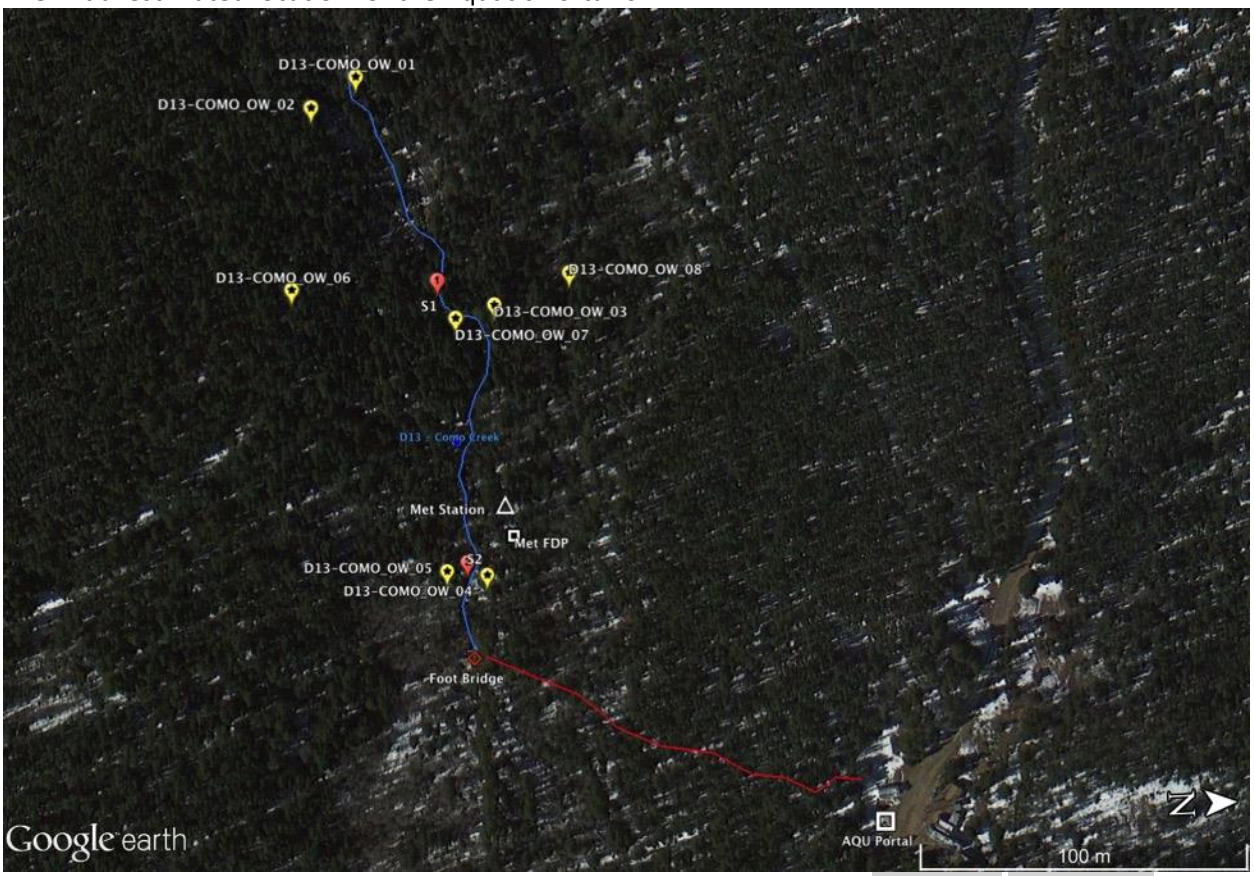

Figure 1 A Google-Earth-Derived Image of Aquatic Auxiliary Portal for Domain 13 Como Creek with existing footpath shown in red.

Table 2 Aquatic Portal Location

Aquatic Portal	Latitude	Longitude
Location	40.036084	-105.543574

3.1.2 Sensor Locations for Construction

AQU, with support from EHS, has the following field GPS coordinates for S1 and S2 and micromet station locations. Many aquatic sites are in narrow canyons or covered by dense canopy, which reduces satellite availability. In these situations, AQU will provide a description of the location and an approximate GPS location (e.g. not accurate to within <1m). This description will suffice for the planning stages, but sites will likely need to be physically marked prior to construction.

These coordinates are to be used for the input to the AIS design:

Table 3 Sensor 1 & Sensor 2 Locations

Sensor	Latitude	Longitude
S1	40.034940°	-105.545333°
S2	40.034965°	-105.544380°

Table 4 Micromet & Discharge Sensor Locations

Sensor	Latitude	Longitude
Micromet	40.035078°	-105.544642°
Met FDP	40.035098°	-105.544536°

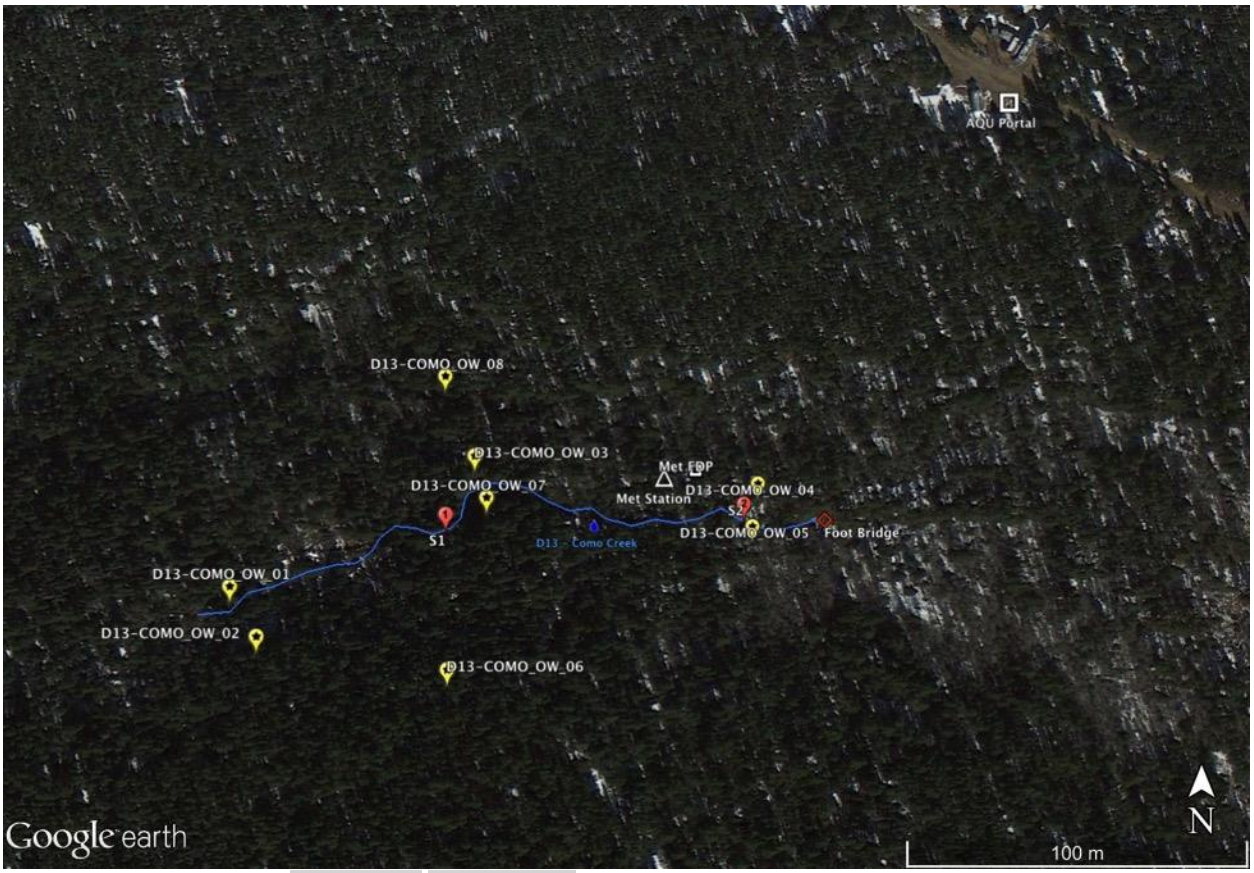

Figure 2 Kmz File of Domain 13 Como Creek Denoting Locations of S1, S2, and Micromet Station

S1 is located just downstream some braiding in the stream.

Figure 3 Photo of S1 Location at Domain 13 Como Creek

S2 occurs at a constricted channel within the stream, followed by a large flow-through pool.

Figure 4 Photo of S2 Location at Domain 13 Como Creek

Figure 5 Photo of Micromet Station Location at Domain 13 Como Creek.

A handful of small trees will need to be removed to accommodate the met station installation. These are shown in Figure 6.

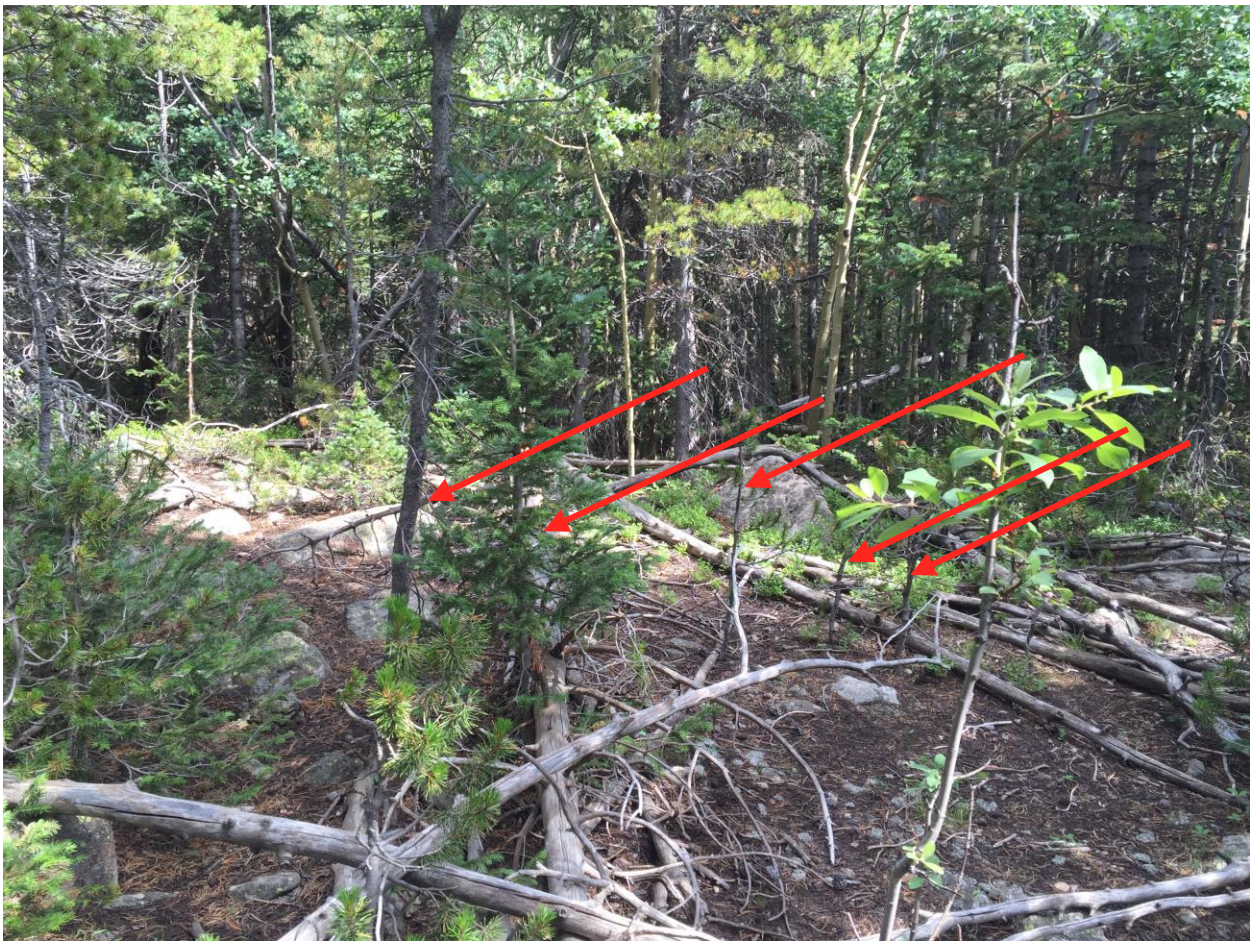

Figure 6. Red arrows show small trees that need to be removed to accommodate met station installation.

3.1.3 Groundwater Wells

The network of shallow groundwater observation wells will be drilled in the vicinity of the stream with 6 wells set near the stream (within 5-10m of the stream edge) and 2 wells set a distance away (~20-50m) from the streams edge to observe the difference between near stream and far from stream hydrologic and geochemical parameters. The position and orientation of the wells is selected to allow for hyporheic studies of the near stream environment and to facilitate measurement of the hydraulic gradient at the site. The wells will be constructed in accordance with State guideline, and will be constructed using either a small track mounted rig (e.g. Geoprobe LT54) or 2-person powered hand auger.

Table 5 GPS coordinates of Groundwater Wells at Domain 13 Como Creek

GW Well	Lat	Long
D13-COMO-OW-01	40.034879°	-105.545328°
D13-COMO-OW-02	40.035003°	-105.545334°

D13-COMO-OW-03	40.035201°	-105.545102°
D13-COMO-OW-04	40.034958°	-105.544819°
D13-COMO-OW-05	40.035062°	-105.544810°
D13-COMO-OW-06	40.034732°	-105.544600°
D13-COMO-OW-07	40.034909°	-105.544352°
D13-COMO-OW-08	40.035016°	-105.544334°

Figure 7 Initial Groundwater Well Locations Based on EMS kmz File at Domain 13 Como Creek

3.1.4 Riparian Vegetation Cover

During 2010-2011 site visits, the following plant density and type were observed by the AQU team:

Canopy cover is 20-30% at sensor location, however, can be quite high in this subalpine forest (>80%). Canopy consists of aspen, spruce and lodgepole pine. Willows line stream bank.

Figure 8 The Riparian Canopy at Domain 13 Como Creek

3.1.5 Bank Morphology

The bank angle is estimated from the top of the bank, where one might stand to observe the stream, to the top of the water. The estimated angle is from the water to the bank, as illustrated in the figure below.

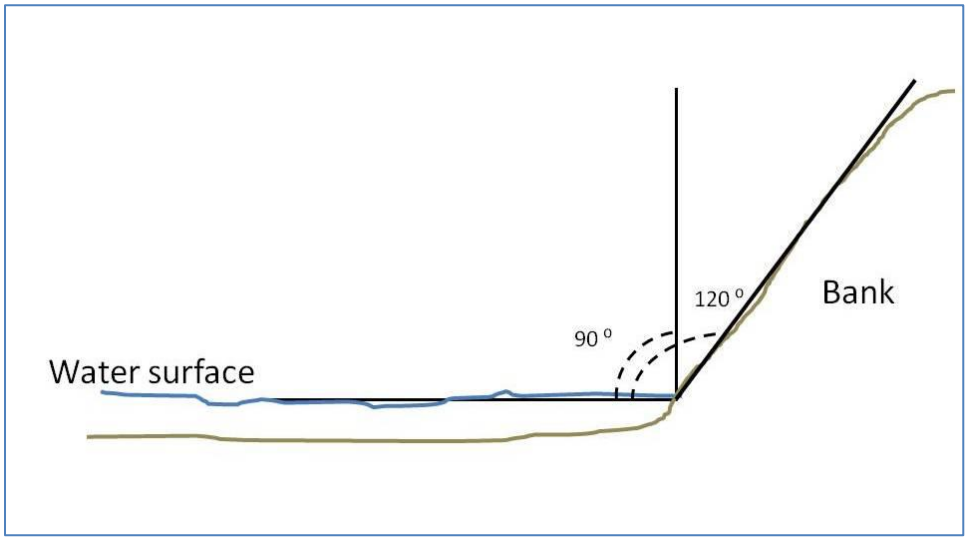

Figure 9 How Bank Angle is Measured

During 2011 site visits, AQU observed the following bank conditions at S1 and S2:

Table 6 Bank Conditions At Domain 13 Como Creek In 2011

Morphology Type	S1	S2
RB* angle	180	110

LB* angle	180	110
Maximum water height	38 cm above water	110 cm from stream bottom
Bankfull width	3.1 m	4.8 m
Substrate composition	Boulder (70) cobble (15), sand (15)	Boulder 980) organic matter and roots (20)

* RB (right bank) and LB (left bank) are determined by facing downstream.

Figure 10 Looking upstream from S2.

3.1.6 Site Photos

The following photos of are representative of the site.

Figure 11 Typical Substrate in Domain 13 Como Creek are mostly boulder, cobbles and sand. Lots of willows and other vegetation in and near stream.

Figure 12 Under water moss on substrate at S2.

Figure 13 Picture illustrating typical substrate and surrounding vegetation of Como Creek.

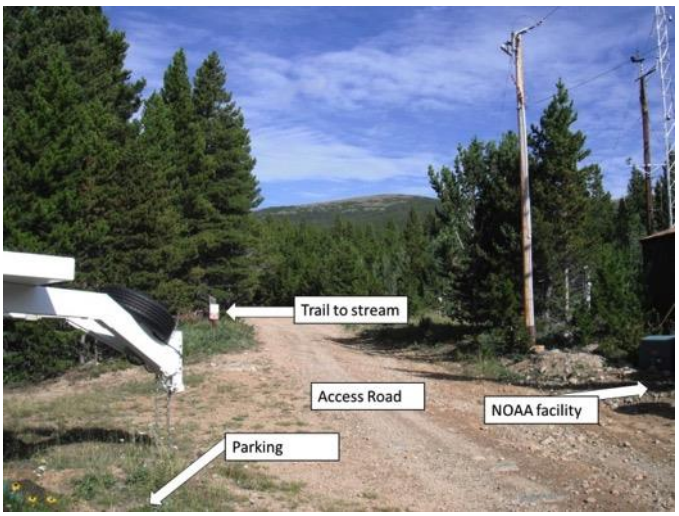

Figure 14 Access road to Como Creek

Figure 15 Large amounts of downed wood in stream. Note wire pulled downstream by woody debris.

3.1.7 Site Access Needs

No pathways, boardwalks, stairs, or ladders are needed at Domain 13 Como Creek for Science purposes.

3.1.8 Communications at the Site

The local communications company is.

ALL - See table in Appendix C for additional IT info

3.1.9 Power at the Site

The local power utility company is The University of Colorado.

3.1.10 Site Science Construction Constraints and Limitations

Site-specific issues to consider at Domain 13 Como Creek are:

- Sensors installs may need to be an overhead design (pending PER negotiations with host). This is due to the sensors potentially being placed in sensitive spawning grounds for protected species.

Driving and access constraints for Domain 13 Como Creek are:

- There is a threatened fish (greenback cutthroat trout) that spawns in the creek and thus walking in the stream is prohibited during certain times of the year.
- There is a NOAA facility located along the road and near the parking area for the stream. Sensor calibration occurs on some Thursdays and Fridays and cars can not be driven near that facility. Thus, cars should be parked facing downhill so they can drift away from the site.
- Road is not drivable during winter months and will require use of a snowmobile or snowcat.

3.1.11 Other Issues

No other science issues are identified at this time.

3.2 West St. Louis Creek

The West St. Louis Creek site is a wadeable stream within the Frasier Experimental Forest near Winter Park, Colorado. It is a high elevation mountain stream at ~2920 m just west of the Continental Divide. The site is in a portion of the experimental forest that has undergone experimental clear cuts, although the clear cuts are well-vegetated as of 2014 and do not appear to significantly influence the watershed of the AQU site. The hydrology of the site is dominated by snowmelt.

The West St. Louis Creek AQU site should be permitted entirely upstream (south) of the water diversion system that is located where the access road crosses the stream at 39.890619°N, -105.909397°W. This water diversion system is managed by Denver Water.

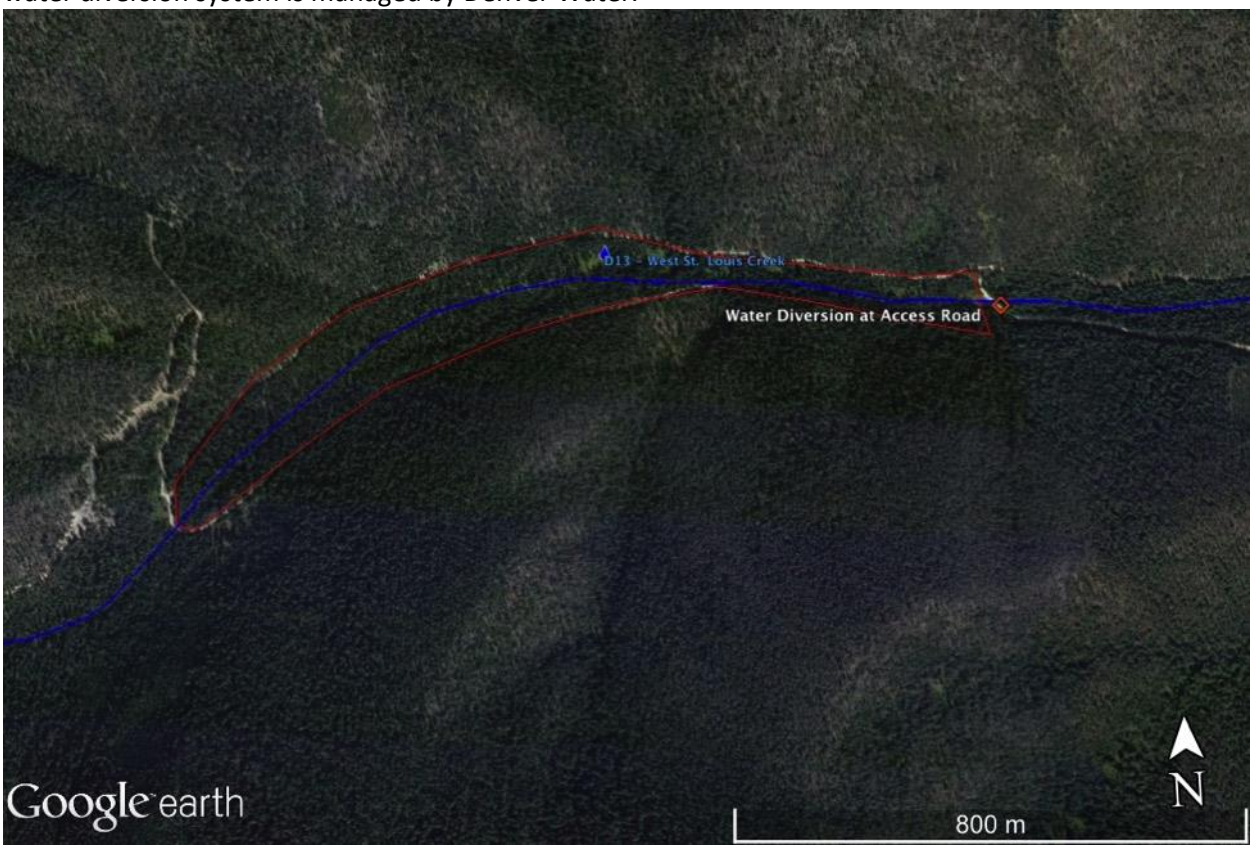

Figure 16. Map showing the requested permittable area (red) and the water diversion at the access road (orange diamond).

3.2.1 Aquatic Auxiliary and Aquatic Portal Locations for Construction

The initial estimated location for the Aquatic Auxiliary Portal is:

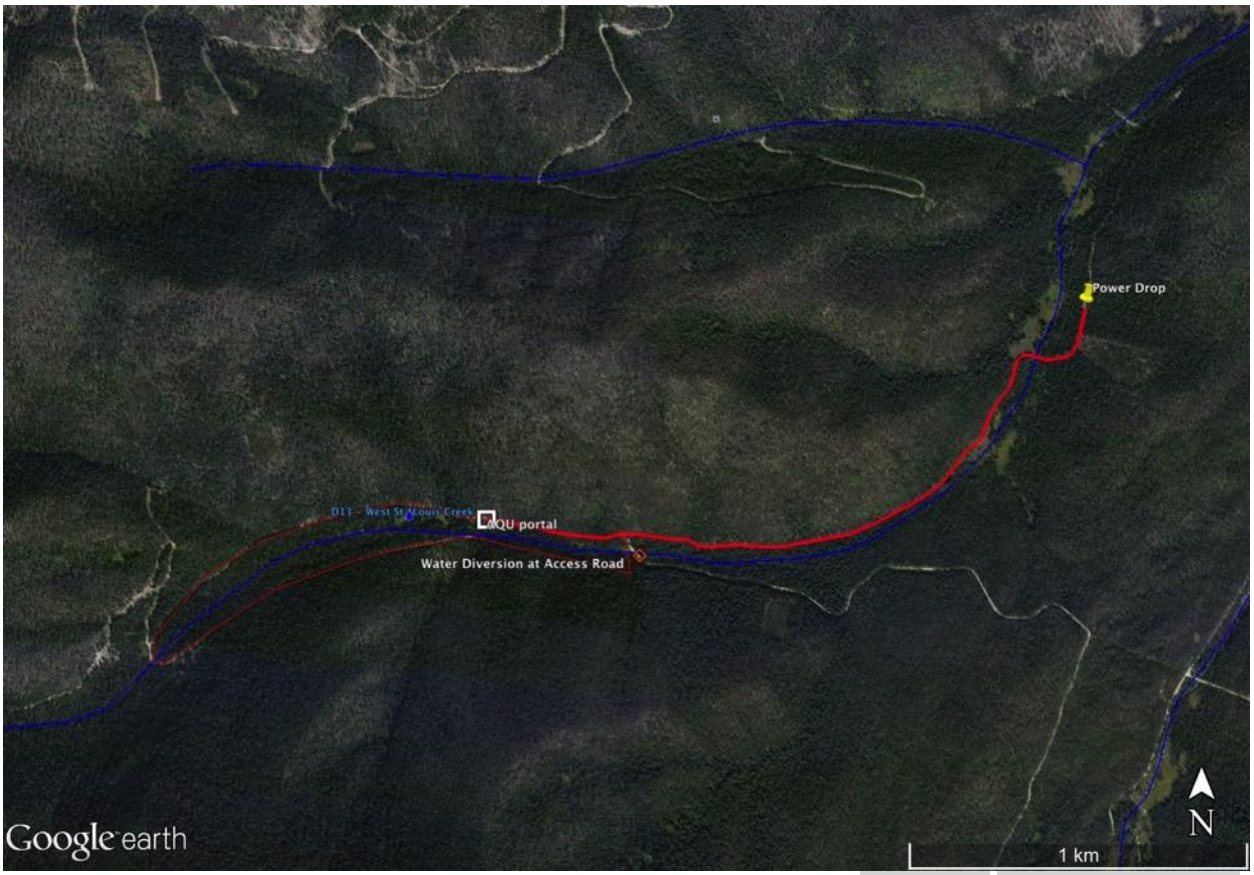

Figure 17 A Google-Earth-Derived Image of Aquatic Auxiliary Portal for Domain 13 West St. Louis Creek

Table 7 Aquatic Auxiliary Portal Location

Aquatic Auxiliary Portal	Latitude	Longitude
Location	39.891569°	-105.914509°

The Aquatic Portal will be located near the Auxillary Portal.

Table 8 Aquatic Portal Location

Aquatic Portal	Latitude	Longitude
Location	39.891569°	-105.914501°

Figure 18. Picture of Portal Location next to road sign at the Parking Area.

3.2.2 Sensor Locations for Construction

AQU, with support from EHS, has the following field GPS coordinates for S1 and S2 and micromet station locations. Many aquatic sites are in narrow canyons or covered by dense canopy, which reduces satellite availability. In these situations, AQU will provide a description of the location and an approximate GPS location (e.g. not accurate to within <1m). This description will suffice for the planning stages, but sites will likely need to be physically marked prior to construction.

These coordinates are to be used for the input to the AIS design:

Table 9 Sensor 1 & Sensor 2 Locations

Sensor	Latitude	Longitude
S1	39.891329°	-105.914424°
S1 FDP	39.891306°	-105.914659°
S2	39.890682°	-105.911327°
S2 FDP	39.890996°	-105.911289°

Table 10 Micromet & Discharge Sensor Locations

Sensor	Latitude	Longitude
Micromet	39.891521°	-105.914668°
Met FDP	39.891565°	-105.914509°
Secondary Precipitation Gauge	39.891568°	-105.914578°

Figure 19 Kmz File of Domain 13 West St. Louis Creek Denoting Locations of S1, S2, and Micromet Station

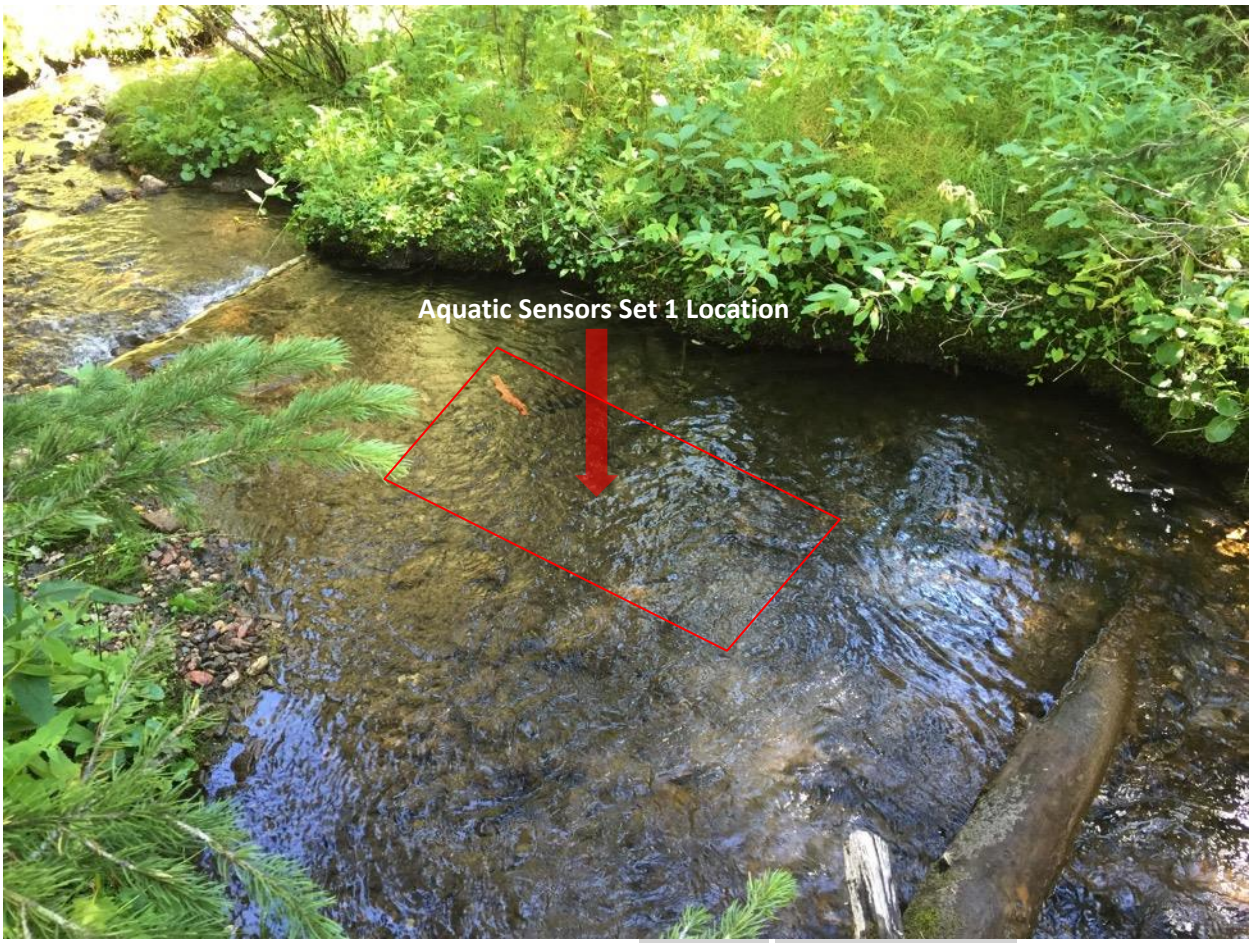

Figure 20 Photo of S1 Location at Domain 13 West St. Louis Creek

Figure 21 Photo of S2 Location at Domain 13 West St. Louis Creek

Figure 22 Photo of Micromet Station Location at Domain 13 West St. Louis Creek.

Figure 23. Photo of Secondary Precipitation Gauge (tipping bucket) Location at Domain 13 West St. Louis Creek.

3.2.3 Groundwater Wells

Groundwater well locations are shown in Figure 26 below. The well locations are tentative and included here to illustrate approximate locations where the wells will be installed. This section will be revised once the NEON Hydrologist makes it to the site to make on-the-ground selections for the groundwater well locations. Details about drilling method, access pathways, and potential issues with installation will be identified at that time and this section will be updated to include that information. Coordinates for the wells are specifically not included in this version of the report to limit potential confusion between initially selected locations and actually proposed locations.

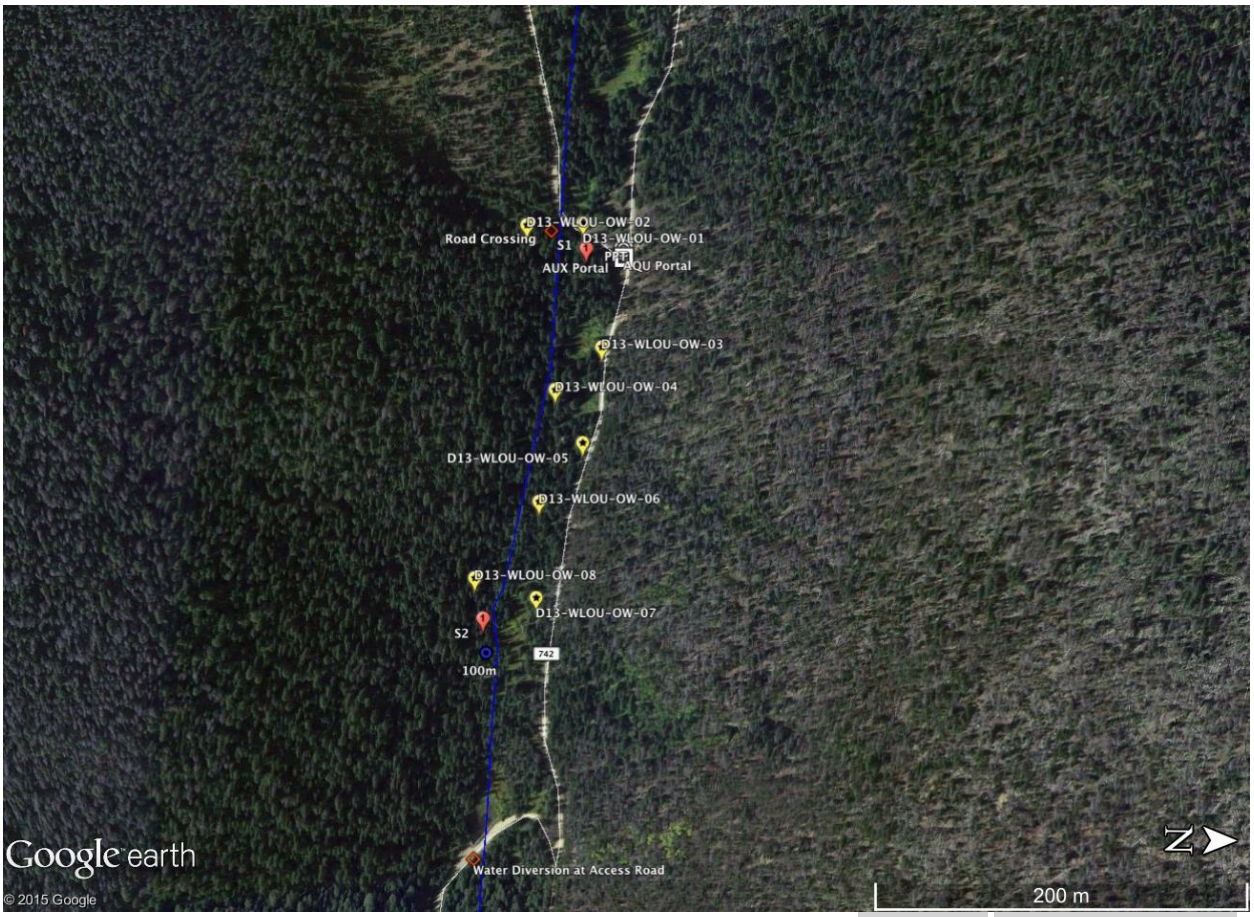

Figure 24 Initial Groundwater Well Locations Based on EMS kmz File at Domain 13 West St. Louis Creek.

Table 11. Name and proposed locations of groundwater wells at Domain 13 West St. Louis Creek.

.GW Well	Lat	Long
D13-WLOU-OW-01	39.891307°	-105.914632°
D13-WLOU-OW-02	39.890960°	-105.914574°
D13-WLOU-OW-03	39.891434°	-105.913599°
D13-WLOU-OW-04	39.891142°	-105.913239°
D13-WLOU-OW-05	39.891316°	-105.912805°
D13-WLOU-OW-06	39.891040°	-105.912311°
D13-WLOU-OW-07	39.891021°	-105.911497°
D13-WLOU-OW-08	39.890636°	-105.911674°

3.2.4 Riparian Vegetation Cover

During 2014 site visit, the following plant density and type were observed by the AQU team:

Figure 25 The Riparian Canopy at Domain 13 West St. Louis Creek is dominated by a dense spruce forest. Treefall is common due to bark beetle infestation at the Experimental Forest.

3.2.5 Geomorphology

The bank angle is estimated from the top of the bank, where one might stand to observe the stream, to the top of the water. The estimated angle is from the water to the bank, as illustrated in the figure below.

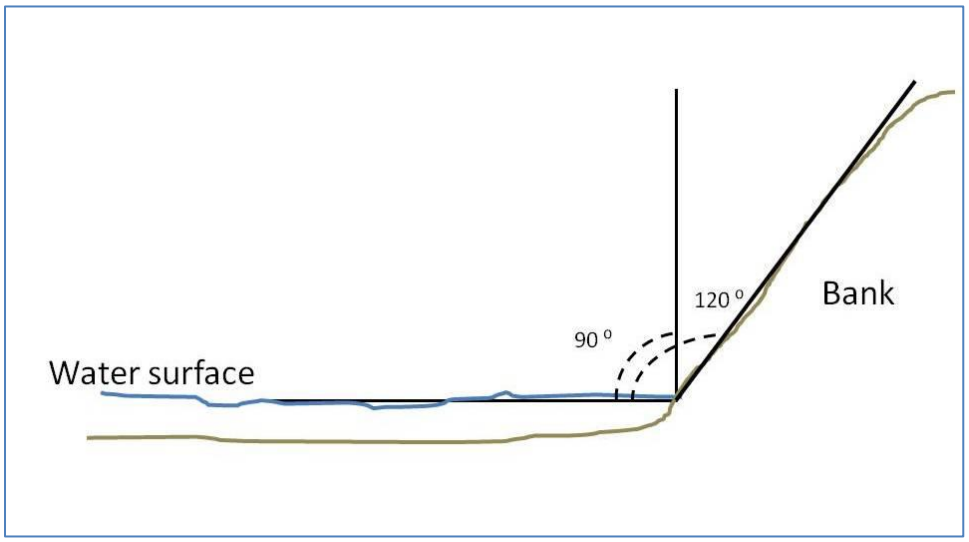

Figure 26 How Bank Angle is Measured

During 2015 site visits, AQU observed the following bank conditions at S1 and S2:

Table 12 Geomorphologic and habitat conditions at sensor locations at Domain 13 West St. Louis Creek in 2015.

Morphology Type	S1	S2
RB* angle	90	90
LB* angle	100	160
Bankful Width	2.8 m	2.3 m
Bankful Depth	1.2 m	1.0 m
Longitudinal Distance (pool)	2.0 m	1.8 m
Maximum water height	Unknown	Unknown
Baseflow water depth (max)	0.28 m	0.46 m
Substrate composition	Boulders, cobbles, pebbles, woody debris	Boulders, cobbles, pebbles, woody debris

- RB (right bank) and LB (left bank) are determined by facing downstream.

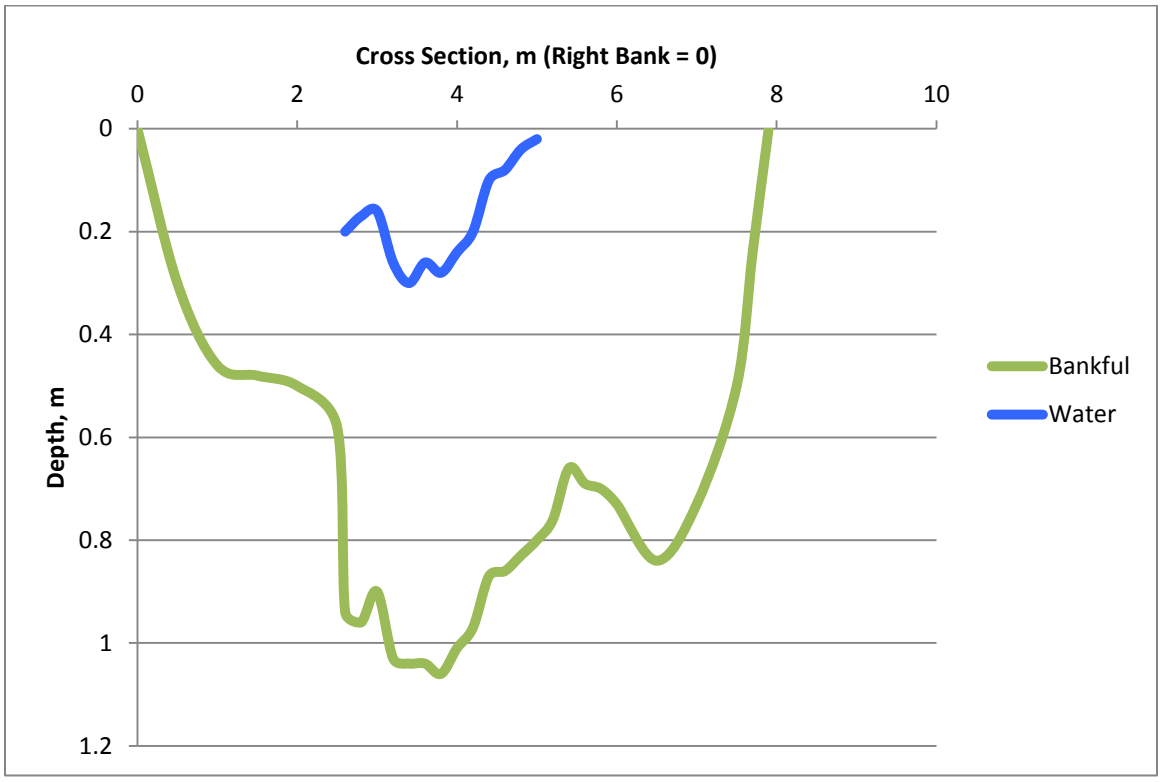

Figure 27. Graph of cross sectional survey at S1 pool.

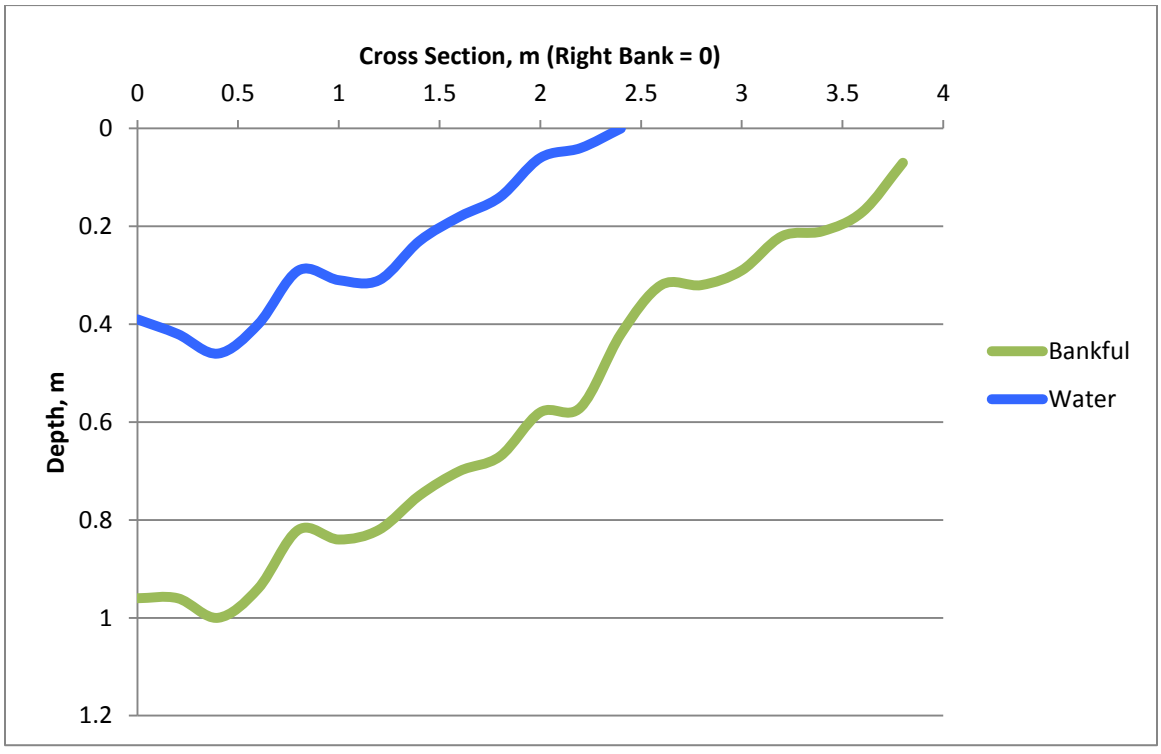

Figure 28. Graph of cross sectional survey at S2 pool.

3.2.6 Stream Flow

Discharge was measured during two site visits in September of 2015. The site was visited on September 3, 2015 during a thrunderstorm accompanied by heavy rain. At this time the stream was elevated above base flow conditions.

Discharged was measured at 232 m and was shown to be 50 liters per second (LPS) at that time. Discharge was remeasured during the next site visit on September 10, 2015. No precipitation was recorded that day. The stream appeared to be at baseflow conditions. Discharge was measured near both the S1 and S2 pools. Both measurements indicated 20 LPS. This is consistent with models run by the EPA within this watershed. This stream is not monitored by the USGS. The water rights are owned by Denver Water. It is possible that Denver Water has historical flow measurements; however, they are typically unresponsive to NEON communications.

A salt injection was used as a tracer to measure the flow and travel time between the proposed sensor set locations (S1 & S2). HOBO conductivity data loggers were initiated and placed in the S1 and S2 pools at the downstream extent of the respective pools. Initial conductivity measurements showed a background of 62 μS (Figure 28). Figure 28 shows a travel time of 50 minutes (11:43am – 12:33 pm) between the proposed sensor set locations.

An additional salt injection was performed using a handheld YSI conductivity meter on September 3, 2015 during the higher flow conditions. This injection was at approximately 232 m and the response was measured at 116m. The travel time was 10 minutes during this bout.

A travel time of 50 minutes during base flow between the sensor sets is acceptable for the measurement of metabolism. The annual variability and seasonal high flow will need to be assessed moving forward. However, we care currently constrained by the acceptable sensor deployment locations that are provided herein.

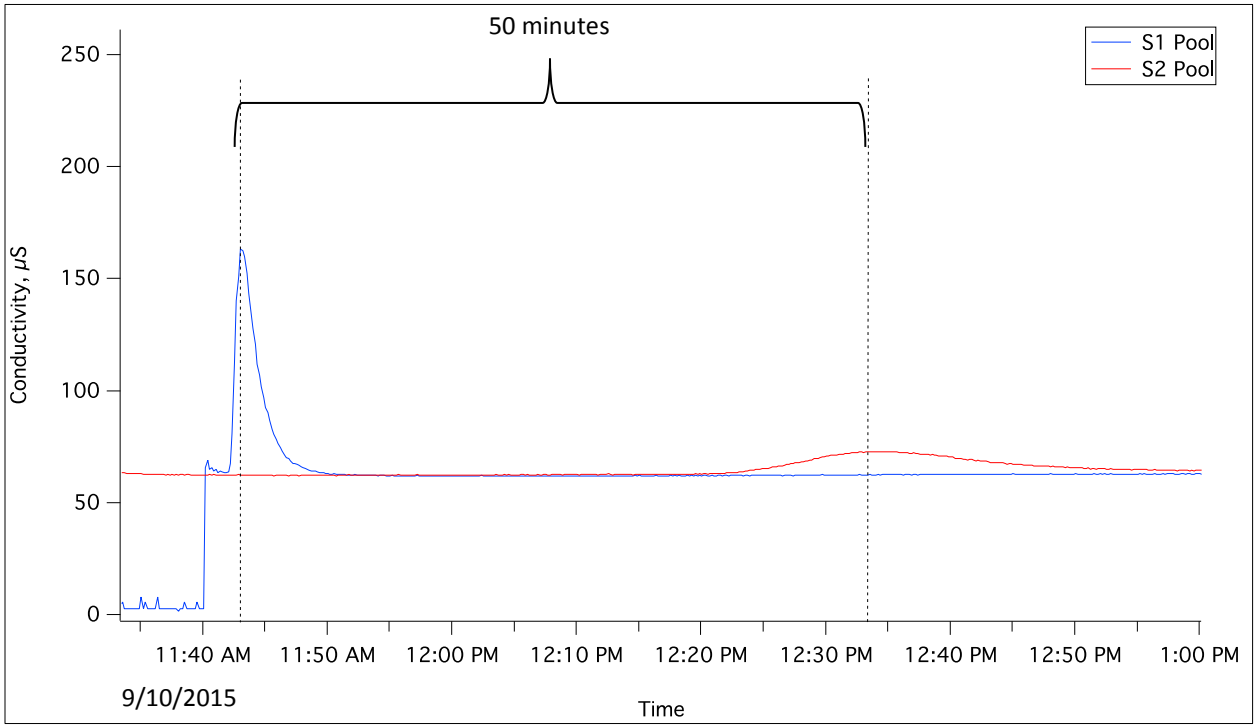

Figure 29. Graph of conductivity measured in S1 and S2 pools after salt injection to determine travel time between sensor sets.

3.2.7 Site Photos

The following photos of West St. Louis Creek are representative of the site.

3.2.7.1 Morphology

Figure 30. Picutre of meander and large woody debris typical of the stream reach.

Figure 31. Picture showing typical pebble, cobble and boulder substrate (taken at approximately 925m).

Figure 32. Picture showing a sandy substrate with areas of organic deposition and algae (taken at 850m).

Figure 33. Picture showing mix of sand and pebble substrate in a depositional zone around a bend (taken at 650m).

Figure 34. Picture showing typical step pools and riffles typical throughout reach (taken at approximately 550m).

3.2.7.2 Flora

Figure 35. Picture showing algal growth on cobble and boulders present in some areas of the reach.

Figure 36. Picture representing typical periphyton in stream.

Figure 37. Picture of aquatic plant in stream.

Figure 38. Picture of typical bank fauna showing moss and leafy plants.

3.2.7.3 Special Features

3.2.7.3.1 Water Diversion

There are a few notable features of the reach. Most notable of the watershed is the diversion that is installed just downstream of the AQU reach at the access road (see orange diamond on Figure 15). Figures 38 and 39 show the diversion and the resulting augmentation in flow downstream.

Figure 39. Picture of water diversion system installed on West St. Louis Creek downstream of the AQU reach at the access road.

Figure 40. Picture of flow downstream of water diversion.

3.2.7.3.2 Channelization

There is a large section of high channelization between 750-900m. Figures 40 – 42 show examples of the braiding in the stream. The stream splits at 750m and then the two channels split more above 800m before returning to a single channel at 900m. The right channel (facing down stream) appears to be the primary channel with the bulk of the flow. However the flow is spread across up to 5 channels within this large swatch. In addition the meadow area along the left bank has very moist soils. It is assumed that surface water mixes across a broad uncontrainted area between 750-900m.

Figure 41. Picutre of channel return at 750m (looking upstream).

Figure 42. Picture of a splitting of the left channel at approximatly 875m (looking upstream).

Figure 43. Picutre of the initial channelization at 900m (looking downstream).

3.2.7.3.3 Surface Inputs

The surface flow appears to be significant within this watershed. There are a number of small surface inputs that are the result of high gradient topography surrounding the sight and an relatively deep organic layer overlying seemingly shallow soils and rock. Meadow areas run intermittently along left bank of the reach. Many of these meadows contained saturated soils and surface water that also contain channels that deliver water to the stream.

Figure 44. Picture of an example of the surface inputs from meadow areas along left bank of stream (taken at approximately 325m).

Figure 45. Picture of small tributary upstream of S1 located immediately downstream of the culvert.

3.2.7.3.4 Road Crossings

There are three four road crossing on West St. Louis Creek (Figure 45). Not all of these affect the AQU reach. The lowest one in the watershed is 250m upstream of where the USFS has dropped power for an experimental plot (Figure 45 – yellow pin). There is a shallow culvert at this crossing that will need to be passed during the construction of the power run out to the AQU Portal. The next road crossing is at the water diversion (see Figures 38-39). This crossing is where the non-gated access road to Byers Peak passes the creek and junctions with the gated access road that the power will run down. Therefore the power will not have to cross the diversion or road crossing.

The next road crossing is between the AQU sensor reach and the upper AOS reach. A culvert that is approximately 1m in diameter carries the stream under the road. Figures 46 – 47 show the downstream and upstream photos of the culvert respectively. This road is composed of dirt and gravel and is not salted through the winter. Recreational traffic to Byers Peak is constrained by limited parking and antipated to have minimal impact on the stream. The road to the Byers Peak trailhead is a one-way loop stating at the AQU Portal. This road passes the creek at the upper extent of the requested permittable area. A slightly smaller culvert passes under the road here where the creek becomes increasingly higher gradient and is no longer approporaite for AQU sampling. The road crossings in general are not considered to negatively impact AQU scientific data or sampling activities.

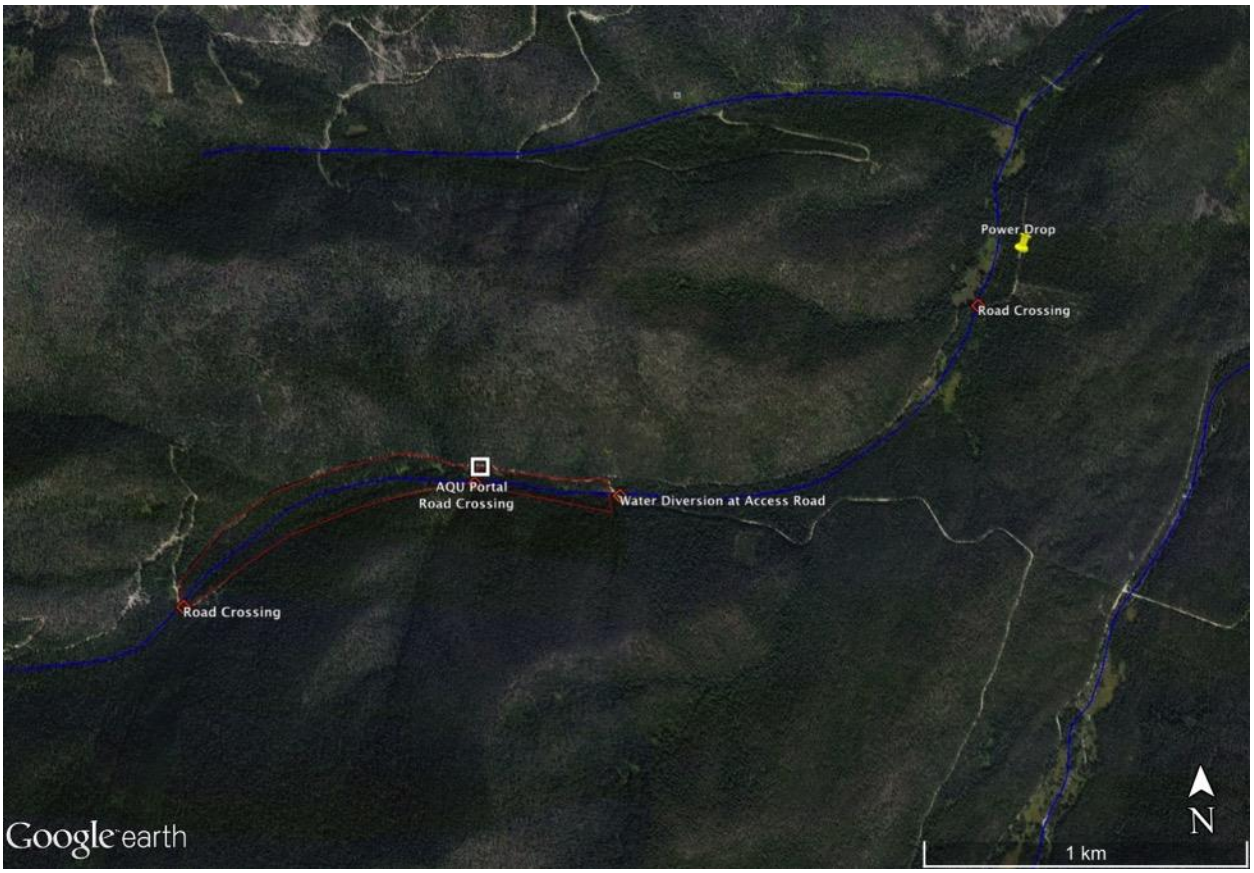

Figure 46. Map showing the road crossings on West St. Louis Creek shown as orange diamonds.

Figure 47. Picture of pool on downstream side of culvert where AQU reach passes the road to Byers Peak Trailhead.

Figure 48. Picture of pool on upstream side of culvert where AQU reach passes the road to Byers Peak Trailhead.

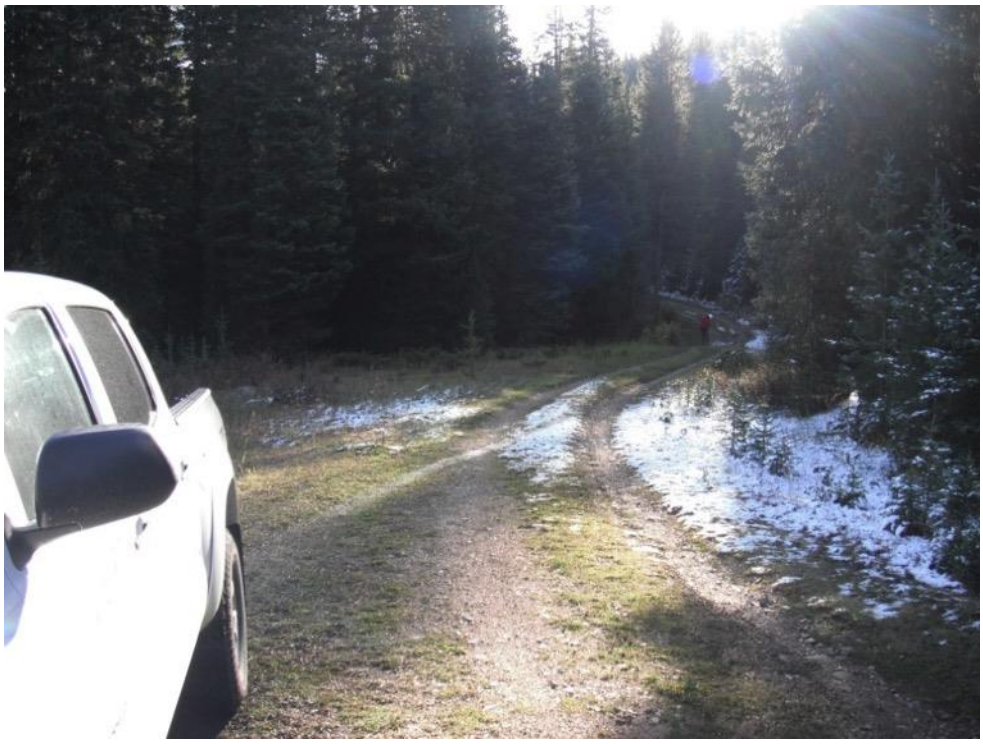

Figure 49 The gated road crosses the stream (via a culvert) upstream of the power drop where the person stands in this photo.

3.2.8 Site Access Needs

No pathways, boardwalks, stairs, or ladders are needed at Domain 13 West St. Louis Creek for Science purposes.

3.2.9 Communications at the Site

The local communications company is found in table in Appendix C for additional IT info

3.2.10 Power at the Site

The local power utility company is Mountain Parks Electric (TBD).

3.2.11 Site Science Construction Constraints and Limitations

Site-specific issues to consider at Domain 13 West St. Louis Creek are:

- No site specific issues at this time.

Driving and access constraints for Domain 13 West St. Louis Creek are:

- No Site specific access constraints at this date.

3.2.12 Other Issues

No other science issues are identified at this time.

4 APPENDIX A. FCC SUMMARY TABLES FOR AIS SITE COMPONENTS AT DOMAIN 13

4.1 Como Creek FCC Summary Table

Site Component	Latitude	Longitude	Units
Stream, Lake, or Stream+STREON	Stream		Description
Aquatic Auxiliary Power Portal location	40.036068°	-105.543455°	Lat, Long in degrees
Aquatic Portal location	40.036068°	-105.543455°	Lat, Long in degrees
Pathway needed? What is length?	NO		Yes/no, description w/ length
Pathway start location	Site1-PathStartLat	Site1-PathStartLong	Lat, Long in degrees
Pathway end location	Site1-PathEndLat	Site1-PathEndLong	Lat, Long in degrees
Stairs or ladder needed?	No		Yes/no, description
Stairs top location	Site1-StairsTopLat	Site1-StairsTopLong	Lat, Long in degrees
Stairs length	Site2-StairsLength		Meters
Ladder top location	Site1-LadderTopLat	Site1-LadderTopLong	Lat, Long in degrees
Ladder length	Site1-LadderLength		Meters
Boardwalk needed? What is length?	No		Yes/no, description w/ length
Boardwalk start location	Site1-BrdwlkStartLat	Site1-BrdwlkStartLong	Lat, Long in degrees
Boardwalk end location	Site1-BrdwlkEndLat	Site1-BrdwlkEndLong	Lat, Long in degrees
Shall stairs, boardwalk be installed during construction?	No		Yes/no, description
Fencing needs	None		Description
Site management			Description
Any additional site specific information			Description

4.2 West St. Louis Creek FCC Summary Table

Site Component	Latitude	Longitude	Units
Stream, Lake, or Stream+STREON	Stream		Description
Aquatic Auxiliary Power Portal location	39.891569°	-105.914509°	Lat, Long in degrees
Aquatic Portal location	39.891569°	-105.914501°	Lat, Long in degrees
Pathway needed? What is length?	No		Yes/no, description w/ length
Pathway start location	Site2-PathStartLat	Site2-PathStartLong	Lat, Long in degrees
Pathway end location	Site2-PathEndLat	Site2-PathEndLong	Lat, Long in degrees
Stairs or ladder needed?	No		Yes/no, description
Stairs top location	Site2-StairsTopLat	Site2-StairsTopLong	Lat, Long in degrees
Stairs length	Site2-StairsLength		Meters
Ladder top location	Site2-LadderTopLat	Site2-LadderTopLong	Lat, Long in degrees
Ladder length	Site2-LadderLength		Meters
Boardwalk needed? What is length?	No		Yes/no, description w/ length
Boardwalk start location	Site2-BrdwlkStartLat	Site2-BrdwlkStartLong	Lat, Long in degrees
Boardwalk end location	Site2-BrdwlkEndLat	Site2-BrdwlkEndLong	Lat, Long in degrees
Shall stairs, boardwalk be installed during construction?			Yes/no, description
Fencing needs	NA		Description
Site management			Description
Any additional site specific information			Description

5 APPENDIX B. EHS SUMMARY TABLES FOR AIS SITE COMPONENTS AT DOMAIN 13

5.1 Como Creek EHS Summary Table

Site Component	Latitude	Longitude	Units
Sensor 1 (S1) location	40.034940°	-105.545333°	Lat, Long in degrees
Sensor 2 (S2) location	40.034965°	-105.544380°	Lat, Long in degrees
Micromet Station location	40.035078°	-105.544642°	Lat, Long in degrees
Met FDP	40.035098°	-105.544536°	Lat, Long in degrees
Aquatic Auxiliary Power Portal location	40.036068°	-105.543455°	Lat, Long in degrees
Aquatic Portal location	40.036068°	-105.543455°	Lat, Long in degrees

5.2 West St. Louis Creek EHS Summary Table

Site Component	Latitude	Longitude	Units
Sensor 1 (S1) location	39.891329°	-105.914424°	Lat, Long in degrees
Sensor 2 (S2) location	39.890682°	-105.911327°	Lat, Long in degrees
S1 FDP	39.891306°	-105.914659°	Lat, Long in degrees
S2 FDP	39.890996°	-105.911289°	Lat, Long in degrees
Micromet Station location	39.891521°	-105.914668°	Lat, Long in degrees
Secondary Precipitaiton Guage location	39.891568°	-105.914578°	Lat, Long in degrees
Met-Precip FDP	39.891565°	-105.914509°	Lat, Long in degrees
Aquatic Auxiliary Power Portal location	39.891569°	-105.914509°	Lat, Long in degrees
Aquatic Portal location	39.891569°	-105.914501°	Lat, Long in degrees

6 APPENDIX C. IT SUMMARY TABLES FOR AIS SITE COMPONENTS AT DOMAIN 13

6.1 Como Creek IT Summary Table

Site Component	Latitude	Longitude	Units
REQUIRED			
Aquatic Auxiliary Power Portal location	40.036068°	-105.543455°	Lat, Long in degrees
Aquatic Portal location	40.036068°	-105.543455°	Lat, Long in degrees
DESIRED			
Cell tower visible from site			Yes/no
Cell phone signal at site			Yes/no, which carrier?
Strength of cell phone signal			Description
Facility on property			Yes/no
Internet connectivity at facility			Yes/no, description
Phone number at facility location			Area code & first 3 needed

6.2 West St. Louis Creek IT Summary Table

Site Component	Latitude	Longitude	Units
REQUIRED			
Aquatic Auxiliary Power Portal location	39.891569°	-105.914509°	Lat, Long in degrees
Aquatic Portal location	39.891569°	-105.914501°	Lat, Long in degrees
DESIRED			
Cell tower visible from site			Yes/no
Cell phone signal at site			Yes/no, which carrier?
Strength of cell phone signal			Description
Facility on property			Yes/no
Internet connectivity at facility			Yes/no, description
Phone number at facility location			Area code & first 3 needed