

Technical Memo

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Date: July 6, 2017
From: Hans R. Hadley, P.E.
Senior Hydraulic Engineer
Subject: MEM-07 Monitoring Report – June 28, 2017 Field Reconnaissance



Expires 12/5/18

WEST Consultants conducted the seventh annual field reconnaissance of the East Fork Lewis River in the vicinity of the Daybreak Mine as required under MEM-07 of the Habitat Conservation Plan. The reconnaissance was conducted by Hans R. Hadley P.E. and Thomas R. Grindeland P.E. on June 28, 2017. Observations of the river and floodplain were made to determine the likelihood of the river avulsing into the existing Daybreak ponds. This memo documents the results of that field reconnaissance. The highest discharge that occurred prior to the site visit for winter 2016/2017 was 9,360 cfs which occurred on March, 15 2017. This is slightly greater than a 2-year recurrence interval peak discharge. Photographs of current conditions were taken at identical locations to those taken in November 2011, March 2013, February 2014, March 2015, and February 2016 utilizing the same location number and photo number. The photograph locations are shown on an aerial photo base map (Appendix A) from June 2015. Arrows are depicted on the map to indicate the direction in which each photo was taken. A corresponding photographic log is provided in Appendix B.

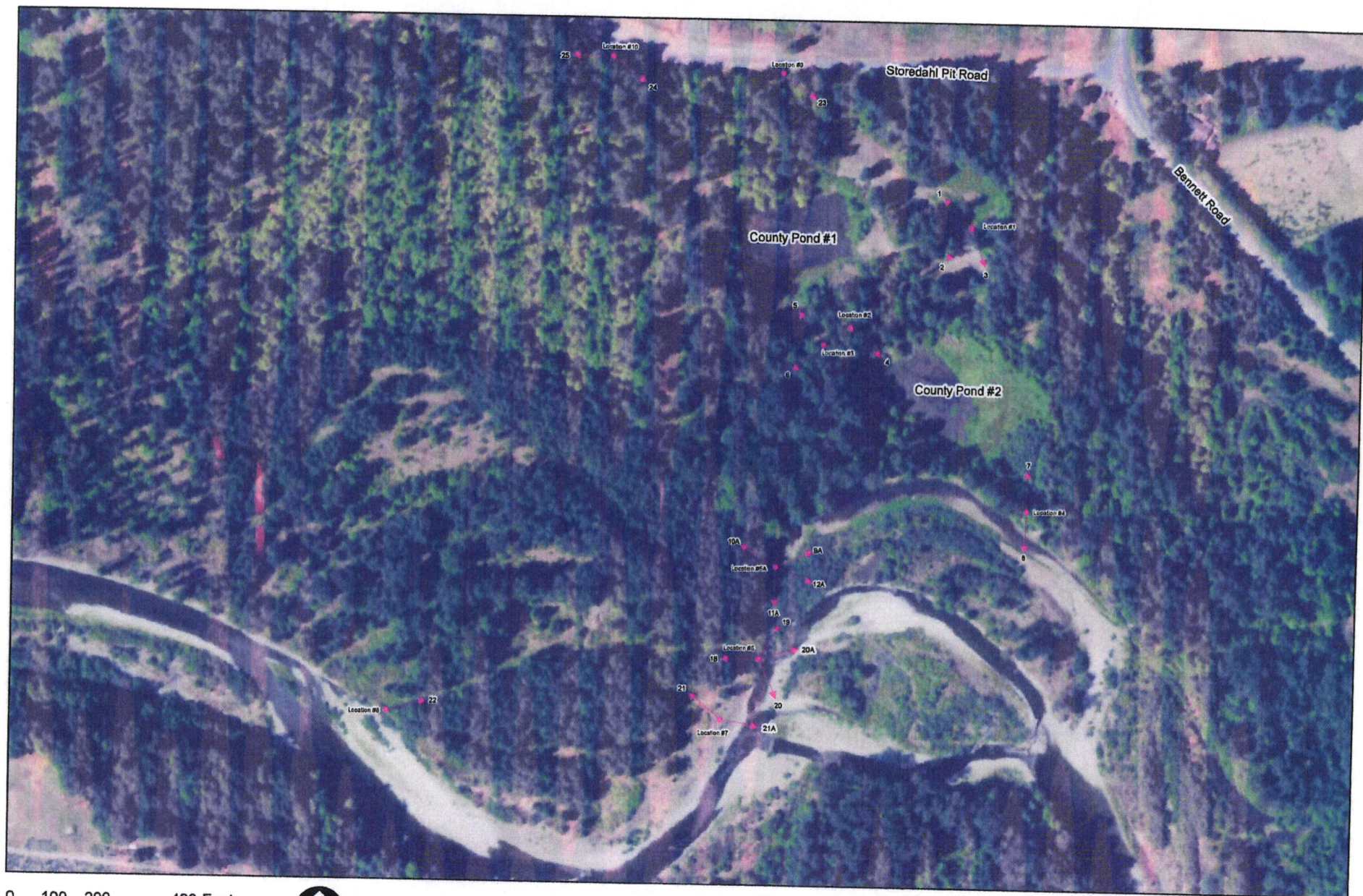
Currently, there are no indications to suggest that the East Fork Lewis River poses an imminent avulsion threat to the Daybreak Ponds. The main channel continues to be generally located along the southern portion of the valley with large areas of floodplain separating the channel from the Daybreak Ponds. However, observations continue to suggest that several small secondary channels are intermittently active within the floodplain between the main channel and Storedahl Pit Road.

At Location #1, the existing headcut does not appear to have changed significantly since the observation in February 2016 (see Photo 3). The secondary channel that parallels Storedahl Pit

Road was not conveying water at the time of the reconnaissance (see Photos 24-28 & 38-39). The flow in the East Fork Lewis River at Heisson was about 250 cfs during this time. The connectivity of this secondary channel with the main channel will continue to be monitored during subsequent field reconnaissance efforts.

It should be noted that, according to an article on The Reflector website (http://www.thereflector.com/news/article_344154b8-4572-11e7-b57e-63ffa95701ac.html), a meander cutoff avulsion occurred along the East Fork Lewis River in February 2017 at a location approximately 2.3 miles upstream from the Daybreak Mine site. Although this site is too far away to have any impact on the project site, it does highlight the active nature of the East Fork Lewis River.

Appendix A: Base Map



0 100 200 400 Feet



Photographic Log Base Map (June 2015) - February 26, 2016 Reconnaissance

Sheet 1 of 3



0 100 200 400 Feet



Photographic Log Base Map (June 2015) - February 26, 2016 Reconnaissance

Sheet 2 of 3



0 100 200 400 Feet



Photographic Log Base Map (June 2015) - February 26, 2016 Reconnaissance

Sheet 3 of 3

Appendix B. Photographic Log



Photo 1. Looking northwest from Location #1 along secondary floodplain channel.



Photo 2. Looking southwest from Location #1 at headcut nick point located at upstream end of secondary floodplain channel.



Photo 3. Looking south southeast from Location #1 toward County Pond #2.



Photo 4. Looking southeast from Location #2 at overflow path from County Pond #2.



Photo 5. Looking northwest from Location #3 at overflow channel into County Pond #1.



Photo 6. Looking southwest from Location #3 at headcut nick point located at upstream end of overflow channel into County Pond #1.



Photo 7. Looking north from Location #4 at overflow channel from E.F. Lewis River into County Pond #2.



Photo 8. Looking south from Location #4 at upstream end of overflow channel from E.F. Lewis River into County Pond #2. Recently abandoned E.F. Lewis River channel in background.



Photo 9A. Looking northeast northeast from Location #5A at right bank of recently abandoned section of E.F. Lewis River at location of overflow channel that leads to County Pond #2.



Photo 10A. Looking northwest from Location #5A at upstream end of secondary channel.



Photo 11A. Looking south from Location #5A at downstream end of recently abandoned section of E.F. Lewis River.



Photo 12A. Looking east southeast from Location #5A at downstream end of second E.F. Lewis meander cutoff channel.



Photo 18. Looking west from Location #6 at upstream end of secondary floodplain channel.



Photo 19. Looking north northeast from Location #6 at rock vane located along the right bank of recently abandoned section of E.F. Lewis River.



Photo 20. Looking southeast from Location #6 at downstream end of recently abandoned section of E.F. Lewis River. Note first cutoff channel at left side of photo.



Photo 20A. Looking east northeast from Location #6 at downstream end of second E.F. Lewis River meander cutoff channel.



Photo 21. Looking northwest from Location #7 at upstream end of secondary floodplain channel.



Photo 21A. Looking east southeast from Location #7 at downstream end of first E.F. Lewis River meander cutoff channel.



Photo 22. Looking east northeast from Location #8 at downstream end of secondary floodplain channel.



Photo 23. Looking southeast from Location #9 in direction of floodplain overflow channel shown in Photo 1.



Photo 24. Looking southeast from Location #10 at floodplain adjacent to Storedahl Pit Road. Historic location of E.F. Lewis River channel.



Photo 25. Looking west from Location #10 at floodplain adjacent to Storedahl Pit Road. Historic location of E.F. Lewis River channel.



Photo 26. Looking southeast from Location #11 at floodplain adjacent to Storedahl Pit Road. Historic location of E.F. Lewis River channel.



Photo 27. Looking south from Location #11 at floodplain adjacent to Storedahl Pit Road. Historic location of E.F. Lewis River channel.



Photo 28. Looking west southwest from Location #11 at floodplain adjacent to Storedahl Pit Road. Historic location of E.F. Lewis River channel.



Photo 29. Looking northwest from Location #12 at Daybreak Pond #5 overflow into E.F. Lewis River floodplain.



Photo 30. Looking northeast from Location # 12 at Daybreak Pond #5.



Photo 31. Looking west northwest from Location #12 at E.F. Lewis River floodplain.



Photo 32. Looking west from Location #13 at E.F. Lewis River floodplain.



Photo 33. Looking southeast from Location #13 at E.F. Lewis River floodplain.



Photo 34. Looking south southeast from Location #14 at historic E.F. Lewis River channel.



Photo 35. Looking west from Location #14 at historic E.F. Lewis River channel.



Photo 36. Looking north northeast from Location # 15 along alignment of historic E.F. Lewis River channel.



Photo 37. Looking south southwest from Location #15 along alignment of historic E.F. Lewis River channel.



Photo 28. Looking west southwest from Location #11 at floodplain adjacent to Storedahl Pit Road. Historic location of E.F. Lewis River channel.



Photo 29. Looking northwest from Location #12 at Daybreak Pond #5 overflow into E.F. Lewis River floodplain.