



June 22, 2015

Ms. Rita Miller
City of Santa Rosa
Utilities Department
4300 Llano Road
Santa Rosa, California 95407

Re: 2014-2015 Annual Monitoring and Reporting for Pepperwood Preserve Sediment Reduction Project SRNO-2H

Dear Ms. Miller,

The following constitutes the annual monitoring and reporting for Pepperwood Preserve per the Sonoma Resource Conservation District (SRCD) contract with the City of Santa Rosa SRNO Task 2H. Crediting options and associated credits for the Pepperwood Preserve Sediment Reduction Project were approved as part of the City of Santa Rosa's Nutrient Offset Program by the Regional Water Quality Control Board (RWQCB), North Coast Region. This report outlines annual monitoring of the installed BMPs.

BMP Inspection

On May 15, 2015, RCD staff inspected all installed BMPs at Pepperwood Preserve and made the following observations:

- All BMPs were found to be operating properly with some needing maintenance as follows:
 - Site 7.2: Landslide should be monitored for further movement. Recommendation to exclude cattle activity from site.
 - Site 6: Additional rock armor on the right bank outboard fill has been knocked out of place but no active erosion. Pacific Watershed Associates recommendation to address site is to remove all rip rap (up to 20 yd³) on right side from culvert outlet to bay tree downstream and grade hillslope to a 2:1 slope angle.
 - Site 8.1: A 3' deep by 2' wide headcut (as mentioned in Site 6.2) has developed. Recommendation to key in 0.5-1.0' rock at each of the headcuts to prevent further erosion and migration of the headcut.
 - Bechtel House Road 44+50: Recommendation to clean both inlet and outlet to reduce plugging.
 - Site 9: Recommendation to monitor gully.

ATTACHMENT 1

Please see field sheets included in Appendix A and associated Photo Plates included in Appendix B.

Credit Verification

Based on annual site monitoring and proper operation of all installed BMPs, the SRCD verifies the mass of P and N controlled to be the same as last year:

- Mass of P controlled and credits eligible during the previous 12 months (July 1, 2014- June 30, 2015) = 543.3 lbs
- Mass of N controlled and credits eligible during the previous 12 months (July 1, 2014- June 30, 2015) = 11,882.1 lbs

Please refer to Table 1 below for a breakdown of crediting options and annual credits verified.

Table 1: As-Built Credits

Crediting Option	As Built ¹			
	# of sites or length	Estimated Sediment reduction	Annual Credits	
			lbs TP/yr	Lbs TN/yr
BMP#1: Currently Eroding stream crossings	23 sites	815 cy	168.3	1,893.4
BMP #2: Other Sites (future potential erosion sites)	13 sites	150cy	37.2	418.3
BMP #3: Currently eroding road surfaces/ditches	2.28 miles	2,230cy	337.5	9,570.4
Totals	-	3,195cy	543.3	11,882.1

¹ Information taken from Pacific Watershed Associates Dec 2013 Report

Conclusions

The Pepperwood Preserve Sediment Reduction Project installed BMPs were found to be functional and operating. Several areas for maintenance were identified and information will be forwarded to Pepperwood Preserve regarding maintenance needs.

If you have any questions, please contact me at 707-569-1448 ext. 101 or at kwester@sonomarc.org.

Thank you,

Kari Wester
Project Manager
Sonoma Resource Conservation District

ATTACHMENT 1

Appendix A: BMP Monitoring Field Sheets

Appendix B: Photo Plates

References:

Pacific Watershed Associates, Inc. *Pepperwood Preserve Sediment Reduction Implementation Project, Sonoma County, California*. December 2013.

Pepperwood Preserve Sediment Reduction Implementation Project
Appendix B- Photo Plates 2014-2015 Annual Monitoring Report



PWA Site #1 (May 2014)



PWA Site #1 (May 2015)

Pepperwood Preserve Sediment Reduction Implementation Project
Appendix A- BMP Monitoring Field Sheets

Date: 5/18/15 RCD Staff: Kevin Cullinen (SRCD)
Observation date: 5/15/15

By signing this form, I attest that this information is true and complete to the best of my abilities.

Staff Signature: Kevin Cull

Bechtel House Road (upgrade):

Abbreviations: CCD = Clean and cute ditch; CD = Critical dip; EOS = End of survey/road log; GCS = Grade control structure; DRC = Ditch relief culvert; OSR-FD = Outslope road and fill the ditch; OSR-KD = Outslope road and keep the ditch; RD = Rolling dip; RSP = Rock slope protection; SOS = Start of survey/road log. Sediment source site numbers and original problem description in bold.

<i>Distance on road (feet)</i>	<i>PWA site#</i>	<i>Road treatment</i>	<i>Site / treatment description</i>	<i>Observations (Note any deficiencies)</i>	<i>Is BMP operating properly?</i>	<i>Photo taken? (Check box)</i>
Road description and general road log notes: Bechtel House road is a year-round use, rock-surfaced road driven by a variety of individuals and groups visiting the Preserve. All disturbed road surfaces were re-rocked with a 10' wide road width using rock estimates associated with each treatment. Sediment source site numbers and original problem description in bold.						
00+00		SOS	Start road log near northern property boundary at intersection with sign to Three Tree Hill and Wiemar Falls nearly 1.9 mi from Franz Valley Road.		N/A	
05+30			Road surface drainage divide		N/A	
06+45		RD 46	1. Installed a type 3 rolling dip. 2. Re-rocked the road surface.	RD functioning well with no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/>
08+30		RD 46.1	1. Installed a type 1 rolling dip. 2. Re-rocked the road surface. 3. No treatments at existing 12" ditch relief culvert.	RD functioning well. A small rill has developed just downslope of the RD, due to hillside runoff, but exits the road immediately and is a non-issue. 12" DRC in good condition and functioning well	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
09+50		RD 47	1. Installed a type 3 rolling dip. 2. Re-rocked the road surface.	RD functioning well with no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	

Pepperwood Preserve Sediment Reduction Implementation Project
Appendix A- BMP Monitoring Field Sheets

Bechtel House Road (upgrade):

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<i>Distance on road (feet)</i>	<i>PWA site#</i>	<i>Road treatment</i>	<i>Site / treatment description</i>	<i>Observations (Note any deficiencies)</i>	<i>Is BMP operating properly?</i>	<i>Photo taken? (Check box)</i>
11+50		RD 48	1. Installed a type 3 rolling dip. 2. Re-rocked the road surface.	RD functioning well with no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
13+25		RD 48.1	1. Installed a type 1 rolling dip. 2. Re-rocked the road surface. 3. No treatments at existing 18" ditch relief culvert.	RD functioning well with no erosion, 18" DRC still functioning well	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
15+35		RD 49	1. Installed a type 1 rolling dip. 2. Re-rocked the road surface. 3. No treatments at existing 18" ditch relief culvert.	RD functioning well with no erosion, 18" DRC in good condition	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
16+20	7.2	Start RSP 1	Site 7.2: Large creeping hillslope landslide. 1. Started rock slope protection for 70' along cutbank where active slumping was occupying ditch and roadway. 2. Excavated slumping hillslope and a 70' wide x 3' deep x 10' tall trench and placed 50 yd ³ of 0.5'-3' riprap. 3. Spoils placed below road and along road surface. 3. Re-rocked the road surface.	The mobilized sediment lobe from March 2014 is more or less in the same spot as last year as is the 1 to 2ft head scarp at the top of the slump. Some finer sediments have reached the rock armor at the bottom of the slope, but are not yet affecting the drainage ditch. The majority of the mobilized material is still 20 ft from the bottom of the slope. Vegetation is slowly re-establishing, so cattle activity should be excluded from this site. Site should be monitored for further movement.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/>
16+90		End RSP 1	Ended rock slope protection treatment.	The rock armor is still functioning, but should be monitored for future slumping	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	

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Bechtel House Road (upgrade):

Abbreviations: CCD = Clean and cute ditch; CD = Critical dip; EOS = End of survey/road log; GCS = Grade control structure; DRC = Ditch relief culvert; OSR-FD = Outslope road and fill the ditch; OSR-KD = Outslope road and keep the ditch; RD = Rolling dip; RSP = Rock slope protection; SOS = Start of survey/road log. Sediment source site numbers and original problem description in bold.

<i>Distance on road (feet)</i>	<i>PWA site#</i>	<i>Road treatment</i>	<i>Site / treatment description</i>	<i>Observations (Note any deficiencies)</i>	<i>Is BMP operating properly?</i>	<i>Photo taken? (Check box)</i>
17+80		RD 50	1. Installed a type 1 rolling dip. 2. Re-rocked the road surface. 3. No treatments at existing 18" ditch relief culvert.	RD functioning well with no erosion, 18" DRC still functioning well	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
19+80	8	RD 51	Site 8: Existing 18" ditch relief culvert at spring. 1. No treatment at site. 2. Installed a type 1 rolling dip. 3. Re-rocked the road surface.	RD functioning well with no erosion, 18" DRC still functioning well	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
20+25			Corral / McCann Homestead		N/A	
21+20	7.1	GCS 1	Site 7.1: Existing 12" ditch relief culvert draining springs with 5' active headcut ~15' below culvert. 1. Installed a grade control structure at headcut using 20 yd ³ of 0.5'-1.5' mixed riprap with u-shape. 2. Spoiled locally on hillslope and road.	Grade control rock armor is still in place and functioning well. No erosion observed and 12" DRC still in good condition.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/>
21+70		RD 52	1. Installed a type 1 rolling dip. 2. Re-rocked the road surface.	RD functioning well with no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
23+80			Added 3 yd ³ of 1'-2' riprap to inlet area of existing 18" ditch relief culvert.	Rock armor intact and functioning well	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
23+90		RD 1	1. Installed a type 1 rolling dip. 2. Re-rocked the road surface.	RD functioning well with no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	

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Abbreviations: CCD = Clean and cute ditch; CD = Critical dip; EOS = End of survey/road log; GCS = Grade control structure; DRC = Ditch relief culvert; OSR-FD = Outslope road and fill the ditch; OSR-KD = Outslope road and keep the ditch; RD = Rolling dip; RSP = Rock slope protection; SOS = Start of survey/road log. Sediment source site numbers and original problem description in bold.

<i>Distance on road (feet)</i>	<i>PWA site#</i>	<i>Road treatment</i>	<i>Site / treatment description</i>	<i>Observations (Note any deficiencies)</i>	<i>Is BMP operating properly?</i>	<i>Photo taken? (Check box)</i>
25+30	7	CD 1	Site 7: Stream crossing with 12" rusted and plugged culvert. 1. Replaced with 24" x 60' long culvert at base of fill in natural channel alignment. 2. Transitioned existing stream channel above road into new lowered inlet and added 5 yd ³ of 1'-2' rip rap at new grade change and inboard fillslope. 3. Installed 20 yd ³ of 1'-3' riprap on outboard fillslope. 4. Installed a critical dip on right hingeline to eliminate diversion potential down road. 5. Re-rocked the road surface.	24" Culvert in good condition and functioning well. Rock armor intact and functioning. Critical dip looks stable.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/>
26+55			Intersection on right to Turtle Pond and start of road log for Goodman Road.		N/A	
		Start OSR-KD 1	1. Started road outsloping and keep ditch for 880'. 2. Re-rocked all disturbed road surfaces through outslope for average 10' road width x 0.3' depth x 880' long with 100 yd ³ of 1.5" minus road rock.	Ditch looks stable, road outslope functioning well with no rilling observed	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
27+50		RD 2	1. Installed a type 1 rolling dip. 2. Re-rocked the road surface.	RD functioning well with no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
29+05	6.2		Site 6.2: Existing 30" ditch relief culvert draining hillslope. 1. No treatment at site.	Site 6 itself is still in good condition and the outlet is vegetated.	NA	

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Abbreviations: CCD = Clean and cute ditch; CD = Critical dip; EOS = End of survey/road log; GCS = Grade control structure; DRC = Ditch relief culvert; OSR-FD = Outslope road and fill the ditch; OSR-KD = Outslope road and keep the ditch; RD = Rolling dip; RSP = Rock slope protection; SOS = Start of survey/road log. Sediment source site numbers and original problem description in bold.

<i>Distance on road (feet)</i>	<i>PWA site#</i>	<i>Road treatment</i>	<i>Site / treatment description</i>	<i>Observations (Note any deficiencies)</i>	<i>Is BMP operating properly?</i>	<i>Photo taken? (Check box)</i>
29+80	6.1	DRC 1/ RD 3	Site 6.1: 10" existing ditch relief culvert that is high and dry and carries no flow. 1. Replaced with a 24" x 40' long culvert. 2. Installed 2 yd ³ of 0.5'-1.5' of riprap to inboard fillslope. 3. Installed 3 yd ³ of 0.5'-1.5' of riprap to outboard fillslope. 4. Plugged ditch on downhill side. 5. Installed a type 1 rolling dip. 6. Re-rocked the road surface.	Culvert in good condition and functioning well. Cattle activity has caused muddy area at outlet, but channel is vegetated well immediately after muddy area	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
30+65		RD 3.1	1. Installed a type 1 rolling dip. 2. Re-rocked the road surface.	RD functioning well with no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
32+15		RD 4/ Start CCD 1	1. Installed a type 2 rolling dip. 2. Started clean and cut inboard ditch for 320'. 3. Re-rocked the road surface.	RD functioning well with no erosion, ditch stable	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
33+75	6		Site 6: Stream crossing with 60" culvert and failing fillslopes. 1. Replaced with a new 60" x 40' long culvert. 2. Installed 30 yd ³ of 0.5'-2' riprap to inboard and outboard fillslopes. 3. Directed new ditches into inlet. 4. Re-rocked the road surface.	More rock armor on the right bank outboard fill has been knocked out of place during the 2014-15 winter storms and are now at the bottom of the channel near the outlet. Rock armor cannot be keyed well into the fill at this location because of the underlying bedrock. No active erosion. PWA made recommendation to remove riprap and grade hillslope.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/>
35+35			Road surface drainage divide.		N/A	

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<i>Distance on road (feet)</i>	<i>PWA site#</i>	<i>Road treatment</i>	<i>Site / treatment description</i>	<i>Observations (Note any deficiencies)</i>	<i>Is BMP operating properly?</i>	<i>Photo taken? (Check box)</i>
		End OSR-KD 1/ End CCD 1	1. Ended road outsloping. 2. Ended clean and cut ditch. 3. Re-rocked the road surface.	Ditch looks stable, road outslope functioning well with no rilling observed	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
36+40	5	CD 3	Site 5: Stream crossing with 48" culvert and failing fillslopes. 1. Replaced with a 48" x 40' long culvert. 2. Installed 20 yd ³ of 0.5'-2' riprap to inboard and outboard fillslopes. 3. Connected right inboard ditch to new inlet. 4. Installed a critical dip on left hingeline. 5. Re-rocked the road surface.	Culvert in good condition and functioning well, rock armor intact, critical dip in good condition	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/>
37+05	4	Start CCD 2	Site 4: Small stream crossing with 10" culvert. 1. Replaced with an 18" x 40' long culvert. 2. Started clean and cut ditch for 120'. 3. Re-rocked the road surface.	Culvert in good conditioning and functioning well. Cattle activity has caused muddy area at outlet, but channel is vegetated well immediately after muddy area	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
38+25		DRC 2/ End CCD 2/ RD 6	1. Installed an 18" x 40' long ditch relief 2. Plugged ditch on downhill side. 3. Ended clean and cut ditch. 4. Installed a type 1 rolling dip. 5. Re-rocked the road surface.	RD functioning well with no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
40+25		RD 7	1. Installed a type 3 rolling dip. 2. Re-rocked the road surface.	RD functioning well with no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
42+70			Road surface drainage divide		N/A	

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Bechtel House Road (upgrade):

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<i>Distance on road (feet)</i>	<i>PWA site#</i>	<i>Road treatment</i>	<i>Site / treatment description</i>	<i>Observations (Note any deficiencies)</i>	<i>Is BMP operating properly?</i>	<i>Photo taken? (Check box)</i>
44+50			Clean inlet and interior of existing 12" ditch relief culvert in low spot.	Inlet was 20% filled with road gravel. The pipe outlet has been reestablished, but is still 33% full of road gravel. Clean both inlet and outlet to reduce plugging.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
45+25	3		Site 3: Stream crossing with 10" culvert. 1. Cleaned culvert inlet.	10" Culvert functioning well and outlet is armored.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
46+25			Road surface drainage divide.		N/A	
49+40		RD 8	1. Installed a type 1 rolling dip. 2. Re-rocked the road surface.	RD functioning well with no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
50+10	2	DRC 3/ Start CCD 3	Site 2: 12" ditch relief culvert draining spring and diverted stream. 1. Replaced with a 30" x 40' long culvert. 2. Installed 25 yd ³ of 0.5'-1.5' riprap on inboard fillslope and ditch. 3. Installed 10 yd ³ of 1'-3' riprap on outboard fillslope. 4. Started clean and cut ditch for 110' to better direct flow from diverted stream crossing. 5. Re-rocked the road surface.	Culvert in good conditioning and rock armor intact at IBF and OBF. Ditch looks stable, and has revegetated well since last year.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/>

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Bechtel House Road (upgrade):

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<i>Distance on road (feet)</i>	<i>PWA site#</i>	<i>Road treatment</i>	<i>Site / treatment description</i>	<i>Observations (Note any deficiencies)</i>	<i>Is BMP operating properly?</i>	<i>Photo taken? (Check box)</i>
51+20	1	End CCD 3	Site 1: Diverted stream crossing. 1. Laid back vertical slopes where stream makes tight turn down to ditch. 2. Keyed in 5 yd ³ of 0.5'-2' riprap to base of bend. 3. Increased channel width and slope down to Site 2. 4. Ended clean and cut ditch.	Rock armor intact and functioning well, no sign of erosion and ditch stable	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/>
51+30			Roller coaster ridge trail on left.		N/A	
51+50			Locked metal gate.		N/A	
53+15		EOS	End road log at road surface drainage divide and intersection to Bechtel House on left.		N/A	

Pepperwood Preserve Sediment Reduction Implementation Project
Appendix A- BMP Monitoring Field Sheets

Goodman Road (upgrade):

Abbreviations: CD = Critical dip; EOS = End of survey/road log; DRC = Ditch relief culvert; GCS = Grade control structure; OSR-FD = Outslope road and fill the ditch; OSR-KD = Outslope road and keep the ditch; RD = Rolling dip; SOS = Start of survey/road log.

<i>Distance on road (feet)</i>	<i>PWA site#</i>	<i>Road treatment</i>	<i>Site / treatment description</i>	<i>Observations (Note any deficiencies/maintenance needs)</i>	<i>Is BMP operating properly?</i>	<i>Photo taken? (Check box)</i>
<p>Road description and general treatment notes: Goodman Road road log extends from Bechtel House Road near corral for over 1.7 mi where it terminates at Rogers Creek. It is rocked and regularly used by the public for the first 0.3 mi from Bechtel House Road to ridge top. From the ridge down the other side the road network is primarily used by the Preserve staff. All disturbed road surfaces that were rocked were re-rocked with a 10' wide road width using rock estimates associated with each treatment in the road log below. Sediment source site numbers and original problem description in bold.</p>						
00+00		SOS	Start road log at intersection with Bechtel House Road with sign to Turtle Pond and Rogers Canyon. No treatments to ditch relief culvert under road at intersection.		N/A	
01+30		RD 9	1. Installed a type 1 rolling dip. 2. Re-rocked the road surface.	RD functioning well with no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
01+35	8.1	GCS 1.1/ GCS 1.2/ GCS 1.3/ Start OSR-KD 3	<p>Site 8.1: Existing 18" ditch relief culvert with outlet erosion gully.</p> <p>1. Installed a grade control structure (GCS 1.1) at ditch relief culvert outlet using 10 yd³ of 0.5'-1' ripap. 2. Installed a grade control structure (GCS 1.2) 75' long 10' below GCS 1.1 using 30 yd³ of 0.5'-1' ripap. 3. Installed a grade control structure (GCS 1.3) at 2' headcut in inboard ditch 50' up from inlet using 5 yd³ of 0.5'-1' ripap to armor the headcut, protect the inboard fillslope and contain ditch flow. 4. Started road outsloping and keep ditch for 445'. 5. Re-rocked all disturbed road surfaces for average 10' road width x 0.3' depth x 445' long with 50 yd³ of 1.5" minus road rock.</p>	<p>All grade control structures look intact and the culvert is in good condition, but a 3' deep x 2' wide head cut has developed at the bottom of this site, 20 feet upstream of Site 6.2. There is also a small headcut above GCS 1.3, which will likely stop when it hits GCS 1.2</p> <p>Key in 0.5-1' rock at each of the headcuts to prevent further erosion and migration of the headcut.</p>	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/>
02+80		RD 10	1. Installed a type 1 rolling dip. 2. Re-rocked the road surface.	RD functioning well with no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	

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<i>Distance on road (feet)</i>	<i>PWA site#</i>	<i>Road treatment</i>	<i>Site / treatment description</i>	<i>Observations (Note any deficiencies/maintenance needs)</i>	<i>Is BMP operating properly?</i>	<i>Photo taken? (Check box)</i>
04+05		RD 11	1. Installed a type 1 rolling dip at existing 18" ditch relief culvert. 2. Re-rocked the road surface.	RD functioning well with no erosion, culvert in good condition	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
05+80		RD 12/ End OSR-KD 3 /Start OSR-FD 1	1. Installed a type 1 rolling dip. 2. Ended road outsloping with a ditch. 3. Started road outsloping with no ditch for 670'. 4. Re-rock all disturbed road surfaces through outslope for average 10' road width x 0.3' depth x 670' long with 75 yd ³ of 1.5" minus road rock.	Road outslope functioning well with no rilling observed, RD functioning well with no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
07+80		RD 13	1. Installed a type 1 rolling dip. 2. Re-rocked the road surface.	RD functioning well with no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
09+95		Enhanced outslope bend	1. Installed an enhanced outslope around bend in road 2. Re-rocked the road surface.	Enhanced outslope around bend is functioning well, no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
12+50		RD 15/ End OSR-FD 1	1. Installed a type 2 rolling dip. 2. Ended road outsloping and fill ditch at RD 15. 3. Re-rocked the road surface.	RD functioning well with no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
13+05		RD 16	1. Installed a type 2 rolling dip. 2. Re-rocked the road surface.	RD functioning well with no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
15+90			Road surface drainage divide with "road closed" sign on post in middle of road. No project specific treatments from this location to Site 9 located 2,500' (0.5 mi) below.		N/A	
21+70			Green unlocked gate-livestock present, keep closed.		N/A	
36+50			Intersection with Goodman Spur on the right.		N/A	

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<i>Distance on road (feet)</i>	<i>PWA site#</i>	<i>Road treatment</i>	<i>Site / treatment description</i>	<i>Observations (Note any deficiencies/maintenance needs)</i>	<i>Is BMP operating properly?</i>	<i>Photo taken? (Check box)</i>
39+70	9		Site 9: Ditch relief culvert with very large outlet gully. 1. No treatments at site.	N/A	N/A	
40+20	10	Start OSR-FD 2	Site 10: Diverted Class III stream. 1. Installed an armored fill crossing using 20 yd ³ of 0.5'-1.5' riprap. 2. Added 3 yd ³ of 0.5'-1.5' riprap above inboard road to stabilize grade change. 3. Started road outsloping and fill ditch for 2,480' to Site 16.	Rock armor looks stable and functioning well. May want to monitor gully at Site 9, which shouldn't be receiving any more drainage from site 10	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
42+95	11	CD 4/ GCS 2	Site 11: Stream crossing with 24" culvert and active 8' tall headcut below culvert. 1. Replaced with a 24" x 60' long culvert. 2. Installed a critical dip on right hingeline. 3. Defined inboard ditch on left for 20' and directed flow into new inlet. 4. Installed a total of 30 yd ³ of 0.5'-2' riprap to inboard and outboard fillslopes. 5. Installed a grade control structure to headcut in channel below outlet 30 yd ³ of 0.5'-2' riprap.	Culvert in good condition. Rock armor intact and stable, no erosion observed, critical dip in good condition and well vegetated	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/>
43+80			Steel unlocked gate-livestock present, keep closed.		N/A	
44+80			Road surface drainage divide.		N/A	
46+70		RD 18	1. Installed a type 1 rolling dip.	RD functioning well with no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
50+45		RD 20	1. Installed a type 1 rolling dip.	RD functioning well with no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	

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Goodman Road (upgrade):

Abbreviations: CD = Critical dip; EOS = End of survey/road log; DRC = Ditch relief culvert; GCS = Grade control structure; OSR-FD = Outslope road and fill the ditch; OSR-KD = Outslope road and keep the ditch; RD = Rolling dip; SOS = Start of survey/road log.

<i>Distance on road (feet)</i>	<i>PWA site#</i>	<i>Road treatment</i>	<i>Site / treatment description</i>	<i>Observations (Note any deficiencies/maintenance needs)</i>	<i>Is BMP operating properly?</i>	<i>Photo taken? (Check box)</i>
51+80	12	RD 20.1	Site 12: Small gully or possible overflow from Turtle pond. 1. Created a wide and broad dip to drain concentrated flow and create better drivability.	Dip functioning well with no erosion observed	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
52+95		RD 21	1. Installed a type 2 rolling dip.	RD functioning well with no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
54+55		RD 22	1. Installed a type 1 rolling dip.	RD functioning well with no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/>
55+35			Intersection with Skovie Road on left.		N/A	
56+10	13		Site 13: Existing 12" ditch relief culvert. 1. No treatment at site.	No erosion observed, but culvert is 40% plugged with wood and debris. Clean out inlet to prevent plugging	N/A	
57+00		RD 24	1. Installed a type 1 rolling dip. 2. Added 10 yd ³ of 0.5'-2' riprap to outboard road.	RD functioning well with no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
58+35	14	RD 25	Site 14: Multiple road surface discharge points with gully development. 1. Installed a type 1 rolling dip. 2. Added 3 yd ³ of 0.5' riprap to outboard road.	RD functioning well with no erosion, rock armor intact	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
59+95			Road surface drainage divide.		N/A	
60+75		RD 26	1. Installed a type 2 rolling dip.	RD functioning well. The small ruts from last year have been vegetated with grasses and look stable.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
61+70	15	RD 27	Site 15: Road surface discharge point into Class III stream 20' above. 1. Installed a type 1 rolling dip.	RD functioning well, The small ruts from last year have been vegetated with grasses and look stable.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	

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Goodman Road (upgrade):

Abbreviations: CD = Critical dip; EOS = End of survey/road log; DRC = Ditch relief culvert; GCS = Grade control structure; OSR-FD = Outslope road and fill the ditch; OSR-KD = Outslope road and keep the ditch; RD = Rolling dip; SOS = Start of survey/road log.

<i>Distance on road (feet)</i>	<i>PWA site#</i>	<i>Road treatment</i>	<i>Site / treatment description</i>	<i>Observations (Note any deficiencies/maintenance needs)</i>	<i>Is BMP operating properly?</i>	<i>Photo taken? (Check box)</i>
64+00		RD 28	1. Installed a type 1 rolling dip.	RD functioning well with no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
65+00	16	CD 6/ End OSR-FD 2	Site 16: Ford crossing on grassy road. 1. Enhanced dip to eliminate diversion potential down road and make better drivability. 2. Ended road outslipping.	Ford in good condition and well vegetated. No tire ruts and dip functioning well	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
68+05			Road surface drainage divide		N/A	
69+20		RD 29	1. Installed a type 1 rolling dip.	RD functioning well with no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
70+45		RD 30	1. Installed a type 1 rolling dip.	RD functioning well with no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
71+25	18	CD 7	Site 18: Very small ford crossing with waterbar. 1. Enhanced dip to eliminate diversion potential down road and make better drivability.	Dip functioning well and draining to landing	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
83+05		RD 31	1. Installed a type 3 rolling dip.	RD functioning well w/ no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
83+60	19		Site 19: Fill crossing. 1. Installed an armored fill crossing using 15 yd ³ of 0.5'-1.5' riprap.	Rock armor intact and crossing looks stable with no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/>
85+00		RD 32	1. Installed a type 1 rolling dip.	RD functioning well w/ no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
85+90		RD 33	1. Installed a type 1 rolling dip.	RD functioning well w/ no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
86+90		RD 34	1. Installed a type 1 rolling dip.	RD functioning well w/ no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	

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Goodman Road (upgrade):

Abbreviations: CD = Critical dip; EOS = End of survey/road log; DRC = Ditch relief culvert; GCS = Grade control structure; OSR-FD = Outslope road and fill the ditch; OSR-KD = Outslope road and keep the ditch; RD = Rolling dip; SOS = Start of survey/road log.						
<i>Distance on road (feet)</i>	<i>PWA site#</i>	<i>Road treatment</i>	<i>Site / treatment description</i>	<i>Observations (Note any deficiencies/maintenance needs)</i>	<i>Is BMP operating properly?</i>	<i>Photo taken? (Check box)</i>
87+40	20		Site 20: Fill crossing with outboard fillslope gully and debris torrented channel. 1. Installed an armored fill crossing using 20 yd ³ of 0.5'-1.5' riprap.	Armored fill in good condition, no movement or erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/>
88+20		RD 34.1	1. Installed a type 3 rolling dip.	RD functioning well w/ no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
89+80	21		Site 21: Oblique fill crossing with small gully across road. 1. Installed an armored fill crossing using 10 yd ³ of 0.5'-1.5' riprap.	Armored fill in good condition, rock armor intact and no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
91+85			Road surface drainage divide.		N/A	
92+30		RD 34.2	1. Installed a type 1 rolling dip.	RD fully vegetated and functioning well w/ no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
93+15		RD 34.3	1. Installed a type 2 rolling dip.	RD fully vegetated and functioning well w/ no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
93+90	22		Site 22: Diverted stream crossing. 1. Defined ditch for 50' up road and connected to new armored fill. 2. Install an armored fill crossing using 15 yd ³ of 0.5'-1.5' riprap.	Rock armor intact and ditch looks stable and vegetated	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
94+75	23		Site 23: Ditch with gully delivering to main channel. 1. Enhanced berm along ditch and created a turnaround and a parking area with spoils from decommissioning on Rogers Canyon Road.	Ditch and berm intact and appear stable. Big leaf maple trees have started growing in the ditch.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
95+45		EOS	End road log at Site 24 (Site 24 detailed in the road log for Rogers Canyon Road).		N/A	

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 Appendix A- BMP Monitoring Field Sheets

Goodman Spur Road (upgrade):

<i>Distance on road (feet)</i>	<i>PWA site#</i>	<i>Road treatment</i>	<i>Site / treatment description</i>	<i>Observations (Note any deficiencies)</i>	<i>Is BMP operating/ maintained properly?</i>	<i>Photo taken? (Check box)</i>
Road description and general treatment notes: Goodman Spur Road extends from Goodman Road near "The Goodman Homestead" to a lower flat lying area with loop access back up to the ridge for ranch vehicles. This road log details treatment only for the first 1,345' from Goodman Spur Road. The road is currently grassed over and used for tending cattle. Sediment source site numbers and original problem description in bold.						
00+00		SOS	Start road log at intersection with Goodman Road near Goodman homestead.		N/A	
06+00	32		Site 32: Ford crossing. 1. No treatments at site.	Ford looks good, but there is some minor bank erosion up and downstream from crossing 1 to 2 foot banks	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
07+65			No treatments at newly installed ditch relief culvert.		N/A	
9+60			Road surface drainage divide.		N/A	
11+60		RD 34.4	1. Installed a type 1 rolling dip.	RD functioning well w/ no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
12+20	33		Site 33: Stream crossing with 18" culvert with scour at outlet and plugged inlet. 1. Installed an armored fill crossing using 25 yd ³ of 0.5'-1.5' riprap.	The 1 ft deep tire ruts from 2014 have been re-graded and filled in with native stream gravels. Site looks stable.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/>
13+45		EOS	End road log at road surface drainage divide.		N/A	

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Skovie Road (upgrade):

Abbreviations: CD = Critical dip; EOS = End of survey/road log; ISR = Inslope road; RD = Rolling dip; SOS = Start of survey/road log.						
<i>Distance on road (feet)</i>	<i>PWA site#</i>	<i>Road treatment</i>	<i>Site / treatment description</i>	<i>Observations (Note any deficiencies)</i>	<i>Is BMP operating/maintained properly?</i>	<i>Photo taken? (Check box)</i>
Road description and general road log notes: Skovie Road extends from Goodman Road near hairpin turn and Site 13 down to middle southern area of property. It is unsurfaced and used seasonally for ranch and power line maintenance. Sediment source site numbers and original problem description in bold.						
00+00		SOS	Start road log at intersection with Goodman Road near sign for Horse Hill and Skovie Basin.		N/A	
00+40		RD 35	1. Installed a type 2 rolling dip.	RD functioning well w/ no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
01+15		RD 36	1. Installed a type 1 rolling dip.	There is no reverse grade on this rolling dip, only a more aggressive outslope, which seems to be functioning ok.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
02+50	34		Site 34: Existing ditch relief culvert in good condition. 1. No treatment at site.	Culvert in good condition, slight rust at inlet, but functioning well	N/A	
05+70			Existing 12" ditch relief culvert in good condition.	Pipe still in good condition	N/A	
07+75			Road surface drainage divide.		N/A	
09+70			Intersection on left, road log continues to right with no gate.		N/A	
10+90		RD 36.1	1. Installed a type 1 rolling dip.	RD functioning well	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
12+10		RD 37	1. Installed a type 1 rolling dip.	RD functioning ok. Small rill from 2014 has vegetated somewhat with grasses.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/>
13+85		RD 38	1. Installed a type 1 rolling dip.	RD functioning well w/ no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	

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Appendix A- BMP Monitoring Field Sheets

Skovie Road (upgrade):

Abbreviations: CD = Critical dip; EOS = End of survey/road log; ISR = Inslope road; RD = Rolling dip; SOS = Start of survey/road log.						
Distance on road (feet)	PWA site#	Road treatment	Site / treatment description	Observations (Note any deficiencies)	Is BMP operating/maintained properly?	Photo taken? (Check box)
14+80		RD 39	1. Installed a type 1 rolling dip.	RD functioning well w/ no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
15+75	35	CD 8/ Start ISR 1	Site 35: Poorly defined ephemeral stream diverted down road. 1. Installed a critical dip on lower left hinge to prevent diversion potential down road. 2. Started inslope road to drain hillslope and road towards spring and historic alignment for 100'.	Dip functioning well	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
16+75		End ISR 1	Ended inslope road.	Road in good condition	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
18+00		RD 40	1. Installed a type 1 rolling dip.	RD functioning well w/ no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
19+00	36		Site 36: Diverted ephemeral stream crossing. 1. Installed an armored fill crossing using 5 yd ³ of 0.5'-1.5' riprap.	Armor fill in good condition, but very springy area makes road surface wet and soft.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
20+10	37		Site 37: 5' x 1' stream crossing with eroding fill. 1. Installed an armored fill crossing with 20 yd ³ of 0.5'-2.0' riprap.	Armored fill appears stable	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
20+60			Road surface drainage divide.		N/A	
24+40		RD 41	1. Installed a type 1 rolling dip.	RD functioning well w/ no erosion	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
25+40	38	EOS	Site 38: Washed out crossing with foot bridge. 1. Decommissioned crossing by excavating sideslopes to natural grade or minimum 2:1 grade. 2. End road log at Site 38.	Everything looks stable. There is historical bank erosion downstream of the crossing.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/>

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Appendix A- BMP Monitoring Field Sheets

Rogers Canyon Road (decommission):

<i>Distance on road (feet)</i>	<i>PWA site#</i>	<i>Road treatment</i>	<i>Site / treatment description</i>	<i>Observations (Note any deficiencies)</i>	<i>Is BMP operating/ maintained properly?</i>	<i>Photo taken? (Check box)</i>
Road description and general road log notes: Rogers Canyon Road travels alongside Rogers Creek and is impassable by vehicle traffic from Goodman Road. Sediment source site numbers and original problem description in bold.						
		SOS	Start road log at the new terminus of Goodman Road and Site 24 on Rogers Creek.		N/A	
00+00	24	Start IPOS 1	Site 24: (2) 48" metal culverts with gabion walls. 1. Decommissioned crossing by removing all fill, culverts, gabions and any other foreign material. 2. Cobbles from gabions were placed along right bank to protect slight bend in Rogers Creek during first winter. 3. Started road ripping and in-place outsloping with a 4' wide foot trail along base of cutbank for 435'.	All rock armor intact and site looks stable. Above the crossing there is some unrelated bank erosion with 3 to 4 foot near vertical sections on the right bank.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/>
01+20	25		Site 25: Washed out stream crossing with 9' x 2' channel and large gully in alluvial fan setting. 1. Decommissioned crossing by laying back vertical sideslopes of gully with minimum 2:1 slopes over 70' long to Rogers Creek. 2. Spoiled locally along cutbanks away from streams and on native hillslope above crossing.	Banks are stable and revegetating.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/>

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Rogers Canyon Road (decommission):

<i>Distance on road (feet)</i>	<i>PWA site#</i>	<i>Road treatment</i>	<i>Site / treatment description</i>	<i>Observations (Note any deficiencies)</i>	<i>Is BMP operating/maintained properly?</i>	<i>Photo taken? (Check box)</i>
03+50	26		Site 26: 95% washed out stream crossing with 10' tall vertical scour banks. 1. Decommissioned crossing by excavating for 90' around vertical face and laying back 2:1 where possible or natural slope. 2. Spoiled locally along cutbanks away from streams and incorporated within in-place outslope.	Site looks good and banks are stable with mulch and vegetation	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
04+35		End IPOS 1/ EOS	1. Ended ripping and in-place outsloping at road surface drainage divide. 2. End all 2013 construction and road log (historic road is washed out or unstable in most locations, and continues to property boundary nearly 0.29 mi to gate and property boundary).	Ripped road looks stable and revegetating	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	

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PWA Site #2 (May 2014)



PWA Site #2 (May 2015)

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PWA Site #5 inlet (May 2014)



PWA Site #5 inlet (May 2015)

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PWA Site #5 outlet (May 2014)



PWA Site #5 outlet (May 2015)

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PWA Site #6 inlet (May 2014)



PWA Site #6 inlet (May 2015)

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PWA Site #6 outlet (May 2014)



PWA Site #6 outlet (May 2015)

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Headcut above PWA Site #6.2, below PWA Site #8.1 (May 2015)



Additional view of headcut above PWA Site #6.2, below PWA Site #8.1 (May 2015)

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PWA Site #7 (May 2014)



PWA Site #7 (May 2015)

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PWA Site 7.2 landslide (May 2014)



PWA Site 7.2 (May 2015)

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PWA Site 7.2 (May 2015)



PWA Site # 8.1 (May 2014)

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PWA Site #8.1 (May 2015)



PWA Site #8.1 Grade Control Structure Headcut (May 2015)

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PWA Site # 11 (May 2014)



PWA Site #11 (May 2015)

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PWA Site # 19 (May 2014)



PWA Site #19 (May 2015)

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PWA Site # 20 (May 2014)



PWA Site #20 (May 2015)

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PWA Site #24 (May 2014)



PWA Site #24 (May 2015)

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PWA Site # 25 (May 2014)



PWA Site #25 (May 2015)

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PWA Site #33 uphill (May 2014)



PWA Site #33 uphill (May 2015)

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PWA Site # 33 – Tire ruts in road (May 2014)



PWA Site #33 (May 2015)

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PWA #RD37 (May 2014)



PWA #RD37 (May 2015)