APPENDIX C

WATER QUALITY MONITORING REPORT (2014-15 and 2015-16)

Appendix C
Malibu Creek and Dominguez Channel Watersheds – Earth-Bottom Channels
Water Quality Monitoring Report
2014-15 and 2015-16 Maintenance Activities

Pursuant to Condition 49 of the Waste Discharge Requirements Order No. R4-2010-0021 (WDR), the Los Angeles County Flood Control District (LACFCD) conducted water quality monitoring during the 2015 clearance season within the Malibu Creek Watershed at all earth-bottom channels cleared during that season. As set forth in the Study Workplan approved by the Regional Board, the results of the monitoring events are set forth in the table below, which reflects the reaches analyzed; sampling dates; sampling parameters; results from upstream, within the project work area, and downstream monitoring stations; and observations and comments.

In the 2014-15 maintenance clearing, water quality monitoring and sampling were conducted at the following SBC Reaches:

Reach 26 – Project 74
Reach 34 – Medea Creek (PD T1005)
Reach 35 – Medea Creek (Under Route 101)
Reach 37 – Medea Creek (d/s of Agoura Road)
Reach 38 – Lindero Creek

In the 2014-15 maintenance clearing, water quality monitoring and sampling were conducted at the following SBC Reaches:

Reach 26 – Project 74
Reach 38 – Lindero Creek

General Observations and Comments

In evaluating the results of the monitoring events, the LACFCD has the following general observations and comments:

- BMPs used included fiber rolls placed perpendicular to and across the creek downstream from active clearing activities. Steps were also taken to minimize contact with water flowing within the reaches and to reduce unnecessary sediment disturbance. BMPs were generally effective in addressing the impacts of maintenance activities in the earth-bottom channel reaches. Additionally, upon noticing elevated turbidity levels, monitoring personnel notified Flood

Maintenance Division (FMD) field personnel who acted to modify BMPs and rectify the identified exceedances. However, BMPs were not always sufficient to achieve attainment of the water quality limits set forth in the WDR.

- Sampling was conducted once within seven days prior to work (preconstruction sampling), daily during the first week of maintenance activities, weekly following the first week of maintenance activities (if applicable), and once within seven days after project completion (post-construction sampling).

Specific Reach Observations and Comments

Reach 26 (2014-15): Preconstruction sampling was conducted within seven days prior to the start of maintenance activities. Turbidity ranged from 5.22 NTU upstream of the work site to 8.68 NTU for the preconstruction upstream and midpoint samples, respectively. A downstream sample was not collected during preconstruction sampling and four of the five construction days as no water was not present downstream of the work site. No downstream turbidity or TSS exceedances occurred during the five days of maintenance activities. After construction, the work area was returned to its pre-maintenance condition and BMPs were removed. Post-construction sampling results were generally consistent with preconstruction baseline sampling levels; midpoint turbidity levels were higher than upstream turbidity levels and TSS thresholds were exceeded at both the upstream and midpoint sampling locations. No exceedances were recorded at the downstream location; therefore, water quality was not being adversely impacted downstream, and no actions were taken.

Reach 26 (2015-16): Pre-construction downstream turbidity (27.7 NTU) exceeded the upstream turbidity threshold (3.64 NTU) prior to any vegetation clearing activities taking place. Due to this initial exceedance, it was advised to the FMD staff to implement some construction BMPs to reduce turbidity measurements throughout the reach. A construction boom was placed at the upstream location, another boom at the midpoint location, and two sets of sand bags and a fiber roll at the downstream location. With all these BMPs in place, there was still a turbidity exceedance on September 30, 2015 at the downstream sampling location (48.8 NTU) compared to the upstream turbidity (21.6 NTU). On October 1, 2015, there was another turbidity exceedance of 42.6 NTU at the downstream compared to 13.9 NTU at the upstream. On October 2, 2015, a final turbidity exceedance of 48.7 NTU at the downstream compared to 13.3 NTU at the upstream occurred. Two additional fiber rolls were implemented at the downstream sampling location.

After all BMPs were in place, there were no additional downstream turbidity exceedances. It is likely that the high turbidity measurements are due to natural conditions of the creek. As shown by the pre-construction baseline result, natural turbidity levels at the downstream were higher than turbidity levels at the upstream. Parts of the reach were polluted with garbage and debris, with lots of floating plants, leaves, and film. The water was very murky and mostly stagnant throughout. The turbidity measurements throughout the reach were irregularly high on various sampling days, so it was difficult to attribute the high turbidity to one cause. It is likely, however, that the high turbidity measurements were not attributable to the construction activities taking place in the reach.

The downstream TSS value of 29 mg/L taken during the pre-construction sampling event was used as the baseline threshold value for TSS threshold exceedances. There occurred one TSS exceedance at the downstream location on October 21, 2015 where the downstream TSS was 150 mg/L. This TSS measurement was taken after two fiber rolls and two sets of sand bags had been implemented a couple weeks before due to turbidity exceedances. The multiple construction BMPs in place at the downstream significantly hindered the flow of water, causing most of the water to puddle up before the fiber rolls and collect lots of sediment, and only allowing a small flow of water to trickle through into a thin stream. Water after the downstream BMPs had high amounts of floating film and algae in the thin stream. Since the sampling stream was so small, most of this film and algae was inadvertently collected in the sample and is likely the cause of the TSS exceedance as no construction activities were taking place at the time of sampling.

Reach 34: Downstream TSS levels exceeded maximum receiving level thresholds (> 10 mg/L) during preconstruction, both days of construction and post-construction sampling. On all of these days, downstream TSS levels were higher than midpoint and upstream levels, suggesting the source of the exceedance was attributed to maintenance activities occurring at the construction site (midpoint sample location). However, during pre-construction, downstream TSS levels were 770 mg/L, which is 77 times higher than the acceptable maximum limit and indicates a baseline TSS level exceedance. Further, the TSS level during post-construction was 730 mg/L, which is 40 mg/L less than the downstream measurement recorded during pre-construction. This suggests a return back to baseline TSS exceedance conditions. During the November 10, 2014 follow-up site visit, downstream TSS levels had dropped to 13 mg/L, which although still exceeds maximum receiving levels, is 50 times less than preconstruction TSS levels. TSS exceedances were recorded upon receipt of the analytical results from the lab and reported to FMD staff in the sampling results memo prepared for this reach.

Midpoint and downstream turbidity exceeded upstream turbidity during preconstruction sampling and was recorded as a baseline condition. During the first day of construction, a turbidity exceedance occurred and was reported to FMD field personnel. It was conveyed that the exceedance was consistent with the preconstruction exceedance for the downstream location; therefore, it would be safe to assume that this is a natural variability that occurs in that reach of the creek. The downstream turbidity level (7.45 NTU) was also lower than the midpoint (9.05 NTU), indicating the fiber roll downstream was effectively reducing turbidity. This downstream turbidity level (7.45 NTU) was also lower than the downstream turbidity level measured during pre-construction activities (9.22 NTU). No turbidity exceedance occurred on the second day of construction. Turbidity thresholds were also exceeded during post-construction sampling; both midpoint and downstream activities (25.2 NTU; 21.9 NTU) were higher than upstream turbidity levels (6.01 NTU) and preconstruction levels. On the November 10, 2014 post-construction follow-up site visit, no downstream turbidity exceedances occurred.

Reach 35: Both days of construction resulted in downstream TSS exceedances; upstream TSS levels were below threshold levels. However, these TSS measurements were 14 mg/L and 19 mg/L, which are relatively close in comparison with the maximum allowable receiving levels (10 mg/L or greater is considered an exceedance). Further, upstream TSS levels during preconstruction measurements showed a level of 14 mg/L at the upstream sampling point, suggesting natural TSS level variation in the stream. TSS exceedances were reported to FMD staff in writing upon receipt of the analytical results from the lab. No turbidity threshold exceedances occurred at Reach 35.

Reach 37: During preconstruction sampling, although baseline TSS levels exceeded the maximum receiving level of 10 mg/L or higher for the upstream and midpoint locations, the baseline downstream TSS levels did not exceed the maximum receiving level. During the first two days of construction, downstream TSS levels were 45 mg/L and 18 mg/L, respectively. Comparing this to midpoint levels those same days (660 mg/L and 110 mg/L, respectively) indicates that BMPs were effectively reducing TSS levels downstream, however, these downstream TSS levels still exceeded the upstream reference sample which was <10 mg/L. During post-construction, the downstream exceedance was 10 mg/L, which is barely above the TSS threshold. TSS exceedances were reported to FMD staff in writing upon receipt of the analytical results from the lab.
Turbidity thresholds were exceeded during both construction days and post-construction. It is important to note that during the first day of construction, the midpoint turbidity level was measured at 74.4 NTU and the downstream turbidity level was measured at 19.5 NTU, indicating that downstream BMPs were effectively reducing turbidity by approximately 74 percent. The turbidity exceedance was reported to FMD field staff. On the second day of construction, midpoint and downstream turbidity levels

improved significantly, and downstream turbidity exceeded upstream levels but only by an increase of less than 2 NTU, which is considered relatively minor. The case is the same for post-construction (0.94 NTU compared to 2.47 NTU).

Reach 38 (2014-15): No downstream TSS exceedances occurred during construction; therefore, BMPs were effectively reducing TSS levels downstream. A turbidity threshold exceedance (20 percent increase of upstream measurement) occurred downstream during construction (2.76 NTU). However, the upstream turbidity measurement was very low (1.34 NTU); therefore, this exceedance was of a relatively low magnitude and not likely detrimental to channel health. Measures to reduce turbidity in response to the exceedance included installation of two fiber rolls placed perpendicular to and across the stream. Downstream turbidity levels during post-construction sampling were comparable to upstream and preconstruction levels.

Reach 38 (2015-16): Baseline TSS measurements were taken within seven days before construction began in the reach. All baseline TSS values were below 10 mg/L throughout the stream. No downstream TSS exceedances occurred during or after construction; therefore, construction fiber rolls were effectively reducing TSS levels before reaching the downstream. Turbidity measurements remained relatively low at the downstream sampling location. A turbidity threshold exceedance occurred on the pre-construction sampling event where the downstream turbidity (2.26 NTU) was greater than a 20% increase of the upstream turbidity (1.46 NTU). This turbidity exceedance only minimally exceeded the allowable threshold and was likely due to natural variability since construction had not begun at the time of sampling. The exceedance was noted and was used as a baseline reference for future turbidity measurements. In addition, the FMD staff was notified of the turbidity exceedance and two fiber rolls were implemented in the stream to reduce any flowing solids. As a result, no further turbidity exceedances occurred at the downstream during any of the other sampling events.

2014-15 Maintenance Activities

Reach 26 (Project 74) Sampling Results

Sampler	Date	Time	Type of Sampling Visit	Sampling Location	Altitude (ft)	GPS Points		Water Temp (F)	DO	pH	Turbidity (NTU)	Exceed Turbdity Thresholds?	TSS (mg/L)	Exceed TSS thresholds?	Visual Observations	Summary/Notes
						Latitude	Longitude									
Paige Anderson	9/15/2014	10:30AM	Pre C	US	30	33º 52' 27" N	118º 17' 26" W	75.05	8.45	8.84	5.22	Reference	38	Yes	Shaded. Little water present, much litter in water and on bank slopes. Small fish in water. Heron present futher downstream	A turbidity exceedance did not occur; as no water was present downstream, a downstream sample could not be taken. Midpoint turbidity was higher than upstream turbidity. Both upstream and midpoint TSS levels exceeded the threshold. No action was necessary; this data was collected to establish a baseline of water quality parameters in the creek.
Paige Anderson	9/15/2014	10:45AM	Pre C	MP	33	33º 52' 23" N	118º 17' 26" W	72.65	2.3	7.05	8.68	N/A	13	Yes	Shaded. Deep, mostly standing water present. Litter on bank slopes.	
Paige Anderson	9/15/2014	11:10AM	Pre C	DS	25	33º 52' 17" N	118º 17' 25" W	No water present	No water present	No water present	No water present	No water present	No water present	N/A	Unshaded; near pilar. Dry; no water present.	
Andrew Paden	9/16/2014	2:40PM	DC	US	30	33º 52' 28" N	118º 17' 24" W	91.8	2.08	8.21	8.33	Reference	340	Yes	Very shallow, standing puddles from very slowly flowing box culvert in direct sunlight. Highly disturbed/turbid water from construction activity upstream.	A turbidity exceedance did not occur; as no water was present downstream, a downstream sample could not be taken. Upstream turbidity was higher than midpoint turbidity. TSS thresholds were exceeded upstream. No action was necessary.
Andrew Paden	9/16/2014	3:00PM	DC	MP	33	33º 52' 23" N	118º 17' 26" W	77.3	9.7	7.37	7.57	N/A	<10	No	Deep, shaded standing pool of water in soft bottom channel.	
Andrew Paden	9/16/2014	3:17PM	DC	DS	25	33º 52' 17" N	118º 17' 25" W	No water present	No water present	No water present	No water present	No water present	No water present	N/A	Unshaded; near pilar. Dry; no water present.	
Andrew Paden	9/17/2014	11:26AM	DC	US	30	33º 52' 28" N	118º 17' 25" W	84.48	3.85	7.98	6.27	Reference	1200	Yes	Very shallow, semi-shaded standing puddles from very slowly flowing box culvert.	A turbidity exceedance did not occur; as no water was present downstream, a downstream sample could not be taken. Turbidity was higher at the midpoint than upstream. TSS thresholds were excceeded upstream. No action was necessary.
Andrew Paden	9/17/2014	12:03PM	DC	MP	33	33º 52' 23" N	118º 17' 26" W	78.21	2.19	7.7	11	N/A	<10	No	Deep, shaded standing pool of water in soft bottom channel.	
Andrew Paden	9/17/2014	12:33PM	DC	DS	25	33º 52' 17" N	118º 17' 25" W	No water present	No water present	No water present	No water present	No water present	No water present	N/A	Unshaded; near pilar. Dry; no water present.	
Andrew Paden	9/18/2014	10:48AM	DC	US	30	33º 52' 28" N	118º 17' 25" W	72.07	6.3	8.34	1.78	Reference	550	Yes	Very shallow, semi-shaded standing puddles from very slowly flowing box culvert.	A turbidity exceedance did not occur; as no water was present downstream, a downstream sample could not be taken. Turbidity was higher at the midpoint than upstream. TSS thresholds were exceeded upstream. No action was necessary.
Andrew Paden	9/18/2014	11:10AM	DC	MP	33	33º 52' 23" N	118º 17' 26" W	73.21	4.26	7.4	31.5	N/A	<10	No	Deep, shaded standing pool of water in soft bottom channel.	
Andrew Paden	9/18/2014	11:25AM	DC	DS	25	33º 52' 17" N	118º 17' 25" W	No water present	No water present	No water present	No water present	No water present	No water present	N/A	Unshaded; near pilar. Dry; no water present.	
Andrew Paden	9/25/2014	12:30PM	DC	US	30	33º 52' 28" N	118º 17' 26" W	73.45	8.71	8.8	5.99	Reference	18	Yes	Fast, shallow flow in SBC, directly below box channel. Visually clear water with small plant debris floating on surface.	A turbidity exceedance did not occur. TSS thresholds were exceeded minorly upstream. No action was necessary.
Andrew Paden	9/25/2014	12:55PM	DC	MP	23	33º 52' 23" N	118º 17' 26" W	70.9	3.47	7.31	1.67	N/A	<10	No	Deep, shaded standing pool of water in soft bottom channel.	
Andrew Paden	9/25/2014	1:16PM	DC	DS	12	33º 52' 17" N	118º 17' 25" W	86.9	7.86	9.89	5.82	No	<10	No	Concrete-lined channel with drainages and weep holes feeding into flow. No observed flow out of project.	
Andrew Paden	9/30/2014	11:30AM	DC	US	20	33º 52' 27" N	118º 17' 26" W	71.19	9.12	8.75	3.26	Reference	54	Yes	Fast, shallow flow in SBC, directly below box channel. Visually clear water with small plant debris floating on surface.	A turbidity exceedance did not occur; as no water was present downstream, a downstream sample could not be taken. Midpoint turbidity level was higher than upstream turbidity; however, this does not qualify as an exceedance. TSS thresholds were exceeded at upstream and midpoint locations. No action was necessary.
Andrew Paden	9/30/2014	12:25PM	DC	MP	27	33º 52' 21" N	118º 17' 26" W	68.15	3.5	6.97	20.7	N/A	18	Yes	Deep, shaded standing pool of water in soft bottom channel.	
Andrew Paden	9/30/2014	1:15PM	DC	DS	12	33º 52' 17" N	118º 17' 25" W	No water present	No water present	No water present	No water present	No water present	No water present	N/A	Concrete-lined channel with drainages and weep holes feeding into flow. No observed flow out of project.	
Andrew Paden	10/7/2014	2:30PM	Post C	US	26	33º 52' 27" N	118º 17' 25" W	84.44	12.51	10.08	4.73	Reference	56	Yes	Very shallow, semi-shaded standing puddles from very slowly flowing box culvert.	A turbidity exceedance did not occur; downstream turbidity was lower than upstream turbidity. TSS thresholds were exceeded at the upstream and midpoint locations; however, downstream TSS levels were below the threshold, and therefore, site conditions were not resulting in degradation of downstream water quality. No action was necessary.
Andrew Paden	10/7/2014	2:54PM	Post C	MP	38	33º 52' 23" N	118º 17' 26" W	70.19	8.64	7.58	12.1	N/A	17	Yes	Deep, shaded standing pool of water in soft bottom channel.	
Andrew Paden	10/7/2014	3:28PM	Post C	DS	34	33º 52' 17" N	118º 17' 24" W	83.69	9.84	8.3	2.66	No	<10	No	Concrete-lined channel with drainages and weep holes feeding into flow. Currently flowing.	

Legend: US: Upstream; MP: Midpoint; DS: Downstream; Pre C: Pre-Construction; DC: During Construction; Post C: Post-Construction

Water Temp WQO: Never an increase of 5 degrees or above 80	**DO WQO:** Never less than 5.0 mg/L	**pH WQO:** Between 6.5 and 8.5; can't raise more than 0.5 degrees	**Turbidity WQO:** Increases shall not exceed 20% if upstream is between 0 and 50, and shall not exceed 10% if ambient is greater than 50	**TSS Threshold:** No greater than 10 mg/L

Reach 34 (Chumash Park) Sampling Data

Sampler	Date	Time	Type of Sampling Visit	Sampling Location	Altitude (ft)	GPS Points		Water Temp (F)	DO	pH	Turbidity (NTU)	Exceed Turbdity Thresholds?	TSS (mg/L)	Exceed TSS thresholds?	Visual Observations						Summary/Notes
						Latitude	Longitude								Water clarity	Flow	Stream depth est	Stream width est	Banks	Wildlife Observed	
Andrew Paden	10/15/2014	14:57	Pre C	US	847	34º 08' 59" N	118º 45' 28" W	73.10	7.79	7.1	1.89	Reference	<10	No	relatively clear	medium	4 inches	2 feet	cement	none	Midpoint and downstream turbidity levels were higher than upstream turbidity, and a baseline turbidity exceedance was noted. Midpoint and downstream TSS levels exceeded TSS thresholds. No action was necessary; this data was collected to establish a baseline of water quality parameters in the creek.
Andrew Paden	10/15/2014	15:17	Pre C	MP	859	34º 08' 58" N	118º 45' 28" W	72.20	9.3	7.74	3.1	N/A	61	Yes	murky	slow	2.5 feet	20 feet	rocky	mosquito fish	
Andrew Paden	10/15/2014	15:30	Pre C	DS	851	34º 08' 58" N	118º 45' 27" W	72.23	5.75	7.76	9.22	Yes	770	Yes	algae, duckweed	slow	2 feet	6 feet	grassy/dirty	mosquito fish	
Paige Anderson	10/16/2014	14:23	DC	US	867	34º 09' 00" N	118º 45' 28" W	80.50	10	8.25	5.01	Reference	39	Yes	relatively clear	medium	5 inches	1 foot	concrete	mosquito fish	A turbidity exceedance occurred and was reported to FMD staff. However, the downstream turbidity level measured during construction (7.45 NTU) was lower than the downstream turbidity level measured during pre-construction activities (9.22 NTU). Therefore, this exceedance can be attrbuted to natural variation in the creek. Upstream, midpoint and downstream TSS levels exceeded thresholds. Downstream TSS levels were higher than midpoint and upstream levels, suggesting the source of the exceedance was not solely attributed to construction activities occurring at the midpoint location.
Paige Anderson	10/16/2014	14:36	DC	MP	848	34º 08' 58" N	118º 45' 28" W	80.01	6.77	7.95	9.05	N/A	82	Yes	algae on top, somewhat clear	slow	2.5 feet	20 feet	rocky	mosquito fish	
Paige Anderson	10/16/2014	14:45	DC	DS	861	34º 08' 58" N	118º 45' 28" W	79.50	6.25	7.92	7.45	Yes	170	Yes	no algae, somewhat clear	slow	2.5 feet	7 feet	grassy/muddy	mosquito fish	
Paige Anderson	10/17/2014	10:15	DC	US	863	34º 09' 00" N	118º 45' 29" W	73.29	8.3	8.11	4.18	Reference	19	Yes	relatively clear	medium	4 inches	2 feet	cement	mosquito fish	A turbidity exceedance did not occur. TSS thresholds were exceeded upstream, midpoint and downstream; and were lowest at the midpoint location. Therefore, it's not likely that the downstream TSS exceedance is attributed to construction activities. No action was necessary.
Paige Anderson	10/17/2014	10:32	DC	MP	844	34º 08' 58" N	118º 45' 28" W	70.98	9.86	8.04	6.42	N/A	11	Yes	murky	slow	2.5 feet	20 feet	rocky	mosquito fish	
Paige Anderson	10/17/2014	10:40	DC	DS	866	34º 08' 57" N	118º 45' 28" W	69.01	8.86	8	4.18	No	27	Yes	somewhat clear	slow/medium	2 feet	6 feet	grassy/dirty	none	
Andrew Paden	10/24/2014	15:00	Post-C	US	837	34º 08' 59" N	118º 45' 28" W	74.01	11.03	7.71	6.01	Reference	25	Yes	clear with scattered surface debris	medium	4 inches	15 feet	cement	none	A turbidity exceedance occurred. Downstream turbidity, although lower than midpoint turbidity, was significantly higher than upstream turbidity. However, this downstream turbidity exceedance could be attributed to the natural increase in turbidity levels from the upstream to downstream locations, as exemplified by the preconstruction turbidity levels. TSS thresholds were exceeded upstream, midpoint and downstream. Downstream TSS levels were higher than midpoint and upstream levels, suggesting the source of the exceedance was not solely attributed to construction activities occurring at the midpoint location. A follow-up visit was scheduled to determine whether the turbidity exceedance persisted.
Andrew Paden	10/24/2014	15:15	Post-C	MP	858	34º 08' 59" N	118º 45' 28" W	73.02	3.16	7.66	25.2	N/A	17	Yes	apparently clear; some small plant debris	nearly still	2 feet	23 feet	dirt/grass	none	
Andrew Paden	10/24/2014	15:25	Post-C	DS	858	34º 08' 58" N	118º 45' 27" W	75.36	6.86	7.65	21.9	Yes	730	Yes	apparently clear; some small plant debris	nearly still	1.5 foot	8 feet	dirt/grass	none	
Paige Anderson	11/10/2014	9:57	Post-C	US	845	34º 08' 59" N	118º 45' 29" W	66.75	13	8.26	3.13	Reference	54	Yes	somewhat clear	slow moving	8 inches	15 feet	concrete	mosquito fish	A turbidity exceedance did not occur. TSS exceedances occurred upstream, at the midpoint, and downstream. However, TSS exceedances downstream were lower than midpoint and upstream levels; therefore, the TSS exceedance cannot be attributed to construction activities. Post-construction downstream turbidity and TSS levels were below preconstruction levels. No action was necessary.
Paige Anderson	11/10/2014	10:09	Post-C	MP	841	34º 08' 59" N	118º 45' 28" W	could not reach sufficient depth for probe to obtain sample without slipping	could not reach sufficient depth for probe to obtain sample without slipping	could not reach sufficient depth for probe to obtain sample without slipping	3.68	N/A	120	Yes	somewhat murky	slow moving (almost ponded)	1 foot	13 feet	silty	none	
Paige Anderson	11/10/2014	10:20	Post-C	DS	835	34º 08' 58" N	118º 45' 28" W	65.5	13.08	8.04	4.04	No	13	Yes	somewhat murky/oily	ponded	10 inches	7 feet	silty/grassy	none	

Legend: US: Upstream; MP: Midpoint; DS: Downstream; Pre C: Pre-Construction; DC: During Construction; Post C: Post-Construction

Water Temp WQO: Never an increase of 5 degrees or above 80	**DO WQO:** Never less than 5.0 mg/L	**pH WQO:** Between 6.5 and 8.5; can't raise more than 0.5 degrees	**Turbidity WQO:** Increases shall not exceed 20% if upstream is between 0 and 50, and shall not exceed 10% if ambient is greater than 50	**TSS Threshold:** No greater than 10 mg/L

Reach 35 (Medea Creek - Main) Sampling Results

Sampler	Date	Time	Type of Sampling Visit	Sampling Location	Altitude (ft)	GPS Points		Water Temp (F)	DO	pH	Turbidity (NTU)	Exceed Turbdity Thresholds?	TSS (mg/L)	Exceed TSS thresholds?	Visual Observations						Summary/Notes
						Latitude	Longitude								Water clarity	Flow	Stream depth est	Stream width est	Banks	Wildlife Observed	
Paige Anderson	10/17/2014	11:08	Pre C	US	912	34º 08' 59" N	118º 45' 28" W	66.03	4.04	7.74	3.06	Reference	14	Yes	somewhat murky	slow, pooled	1.5 feet	25 feet	muddy/ slippery	none	A turbidity exceedance did not occur. TSS thresholds were exceeded upstream. No action was necessary; this data was collected to establish a baseline of water quality parameters in the creek.
Paige Anderson	10/17/2014	11:24	Pre C	MP	858	34º 08' 58" N	118º 45' 28" W	72.2	9.3	7.74	1.76	N/A	<10	No	somewhat clear	slow, pooled	1.5 feet	12 feet	rock	crawdads	
Paige Anderson	10/17/2014	11:35	Pre C	DS	858	34º 08' 58" N	118º 45' 27" W	72.23	5.75	7.76	2.01	No	<10	No	somewhat clear	medium	6 inches	20 feet	cement	none	
Andrew Paden	10/20/2014	13:59	DC	US	853	34º 08' 42" N	118º 45' 27" W	65.47	5.45	7.23	2.87	Reference	<10	No	murky	slow, pooled	2 feet	30 feet	muddy	a few unidentified fish (ca. 1 ft long)	A turbidity exceedance did not occur. TSS thresholds were exceeded slightly downstream. No action was necessary.
Andrew Paden	10/20/2014	14:10	DC	MP	860	34º 08' 43" N	118º 45' 28" W	65.65	5.77	7.55	1.9	N/A	<10	No	somewhat clear	slow, pooled	2 feet	20 feet	rock	none	
Andrew Paden	10/20/2014	14:25	DC	DS	848	34º 08' 42" N	118º 45' 28" W	67.47	8.16	7.79	2.85	No	14	Yes	somewhat clear	medium	6 inches	20 feet	cement	none	
Paige Anderson	10/21/2014	10:58	DC	US	867	34º 08' 45" N	118º 45' 29" W	65.25	4.2	7.85	2.58	Reference	<10	No	murky	slow/ stagnant	1.5 feet	15 feet	muddy	none	A turbidity exceedance did not occur. TSS thresholds were exceeded slightly downstream. No action was necessary.
Paige Anderson	10/21/2014	10:44	DC	MP	862	34º 08' 43" N	118º 45' 28" W	64.74	5.9	7.51	1.92	N/A	<10	No	somewhat murky	slow/ stagnant	1 foot	10 feet	rocky	crawdads	
Paige Anderson	10/21/2014	10:32	DC	DS	842	34º 08' 41" N	118º 45' 29" W	65	5.93	7.87	1.71	No	19	Yes	relatively clear	medium	9 inches	15 feet	concrete	none	
Andrew Paden	10/28/2014	14:20	Post-C	US	858	34º 08' 42" N	118º 45' 27" W	62.11	3.93	7.4	3.15	Reference	<10	No	murky	slow/ stagnant	1.5 feet	15 feet	muddy	none	A turbidity exceedance did not occur. No TSS exceedances occurred. Post-construction downstream turbidity and TSS levels were comparable to or below preconstruction levels. No action was necessary.
Andrew Paden	10/28/2014	14:35	Post-C	MP	850	34º 08' 43" N	118º 45' 28" W	62.59	6.69	7.54	1.84	N/A	<10	No	somewhat murky	slow/ stagnant	1 foot	10 feet	rocky	none	
Andrew Paden	10/28/2014	14:55	Post-C	DS	848	34º 08' 42" N	118º 45' 28" W	63.28	8.22	7.63	1.33	No	<10	No	relatively clear	medium	9 inches	15 feet	concrete	none	

Legend: US: Upstream; MP: Midpoint; DS: Downstream; Pre C: Pre-Construction; DC: During Construction; Post C: Post-Construction

Water Temp WQO:	**DO WQO:**	**pH WQO:**	**Turbidity WQO:**	**TSS Threshold:**
Never an increase of 5 degrees or above 80 degrees	Never less than 5 mg/L	Between 6.5 and 8.5; can't raise more than 0.5	Increases shall not exceed 20% if upstream is between 0 and 50 NTU, and shall not exceed 10% if ambient is greater than 50 NTU	Less than 10 mg/L

Reach 37 (Medea Creek and Cheseboro Outlet) Sampling Results

Sampler	Date	Time	Type of Sampling Visit	Sampling Location	Altitude (ft)	GPS Points		Water Temp (F)	DO	pH	Turbidity (NTU)	Exceed Turbdity Thresholds?	TSS (mg/L)	Exceed TSS thresholds?	Visual Observations						Summary/Notes
						Latitude	Longitude								Water clarity	Flow	Stream depth est	Stream width est	Banks	Wildlife Observed	
Paige Anderson	10/21/2014	11:18	Pre C	US	776	34º 08' 31" N	118º 45' 32" W	66.27	9.37	8.07	12.2	Reference	47	Yes	somewhat clear (algae chunks)	medium	7 inches	15 feet	cement	none	A turbidity exceedance did not occur. TSS exceedances occurred at upstream and midpoint locations. No action was necessary; this data was collected to establish a baseline of water quality parameters in the creek.
Paige Anderson	10/21/2014	11:23	Pre C	MP	814	34º 08' 31" N	118º 45' 33" W	65.97	9.63	7.99	2.69	N/A	18	Yes	somewhat murky	slow	1.5 feet	23 feet	rubble rock	mosquito fish	
Paige Anderson	10/21/2014	11:36	Pre C	DS	818	34º 08' 31" N	118º 45' 35" W	64.94	8.12	7.99	2.93	No	<10	No	somewhat murky	medium	1 foot	8 feet	dirt/grass	mosquito fish	
Andrew Paden	10/23/2014	13:00	DC	US	812	34º 08' 31" N	118º 45' 32" W	76.25	9.29	7.95	4.7	Reference	<10	No	clear with scattered surface debris	medium	7 inches	15 feet	cement	none	A turbidity exceedance occurred. TSS exceedances occurred at midpoint and downstream locations. However, downstream turbidity levels were over four times lower than midpoint turbidity levels (19.5 NTU versus 74.4 NTU). Further, downstream TSS levels were over 14 times lower than midpoint levels (14 mg/L versus 660 mg/L). This data indicates that BMPs were effectively reducing turbidity and TSS by significant amounts. The exceedances were reported to FMD staff.
Andrew Paden	10/23/2014	13:10	DC	MP	812	34º 08' 31" N	118º 45' 33" W	76.88	7.05	7.96	74.4	N/A	660	Yes	high amounts of sediment and debris	slow	1.5 feet	23 feet	rubble rock	crawdad	
Andrew Paden	10/23/2014	13:15	DC	DS	807	34º 08' 31" N	118º 45' 35" W	75.7	5.73	7.9	19.5	Yes	45	Yes	somewhat murky	medium	1 foot	8 feet	dirt/grass	none	
Andrew Paden	10/24/2014	14:00	DC	US	812	34º 08' 31" N	118º 45' 32" W	74.3	9.01	7.96	2.14	Reference	<10	No	clear with scattered surface debris	medium	6 inches	15 feet	cement	none	A turbidity exceedance occurred, but only by an increase of less than 2 NTU (from 2.14 NTU upstream to 4.02 NTU downstream), which is considered a relatively minor exceedance. TSS levels were over 6 times lower than midpoint levels (18 mg/L versus 110 mg/L). This data indicates that downstream BMPs were effectively reducing turbidity and TSS. No action was necessary.
Andrew Paden	10/24/2014	14:15	DC	MP	812	34º 08' 31" N	118º 45' 33" W	75.03	7.83	8.02	5.09	N/A	110	Yes	apparently clear; some small plant debris	nearly still	6 inches	23 feet	rubble rock	none	
Andrew Paden	10/24/2014	14:20	DC	DS	805	34º 08' 31" N	118º 45' 35" W	74.03	6.96	7.94	4.02	Yes	18	Yes	apparently clear; some small plant debris	medium	1 foot	8 feet	dirt/grass	none	
Andrew Paden	10/28/2014	13:00	Post-C	US	812	34º 08' 31" N	118º 45' 32" W	76.05	12.28	8.13	0.97	Reference	<10	No	clear with scattered surface debris	medium	6 inches	15 feet	cement	none	A turbidity exceedance occurred, but only by an increase of less than 2 NTU (from 0.97 to 2.47 upstream), which is considered a relatively minor exceedance. Further, downstream turbidity was higher than midpoint turbidity, indicating its increase could at least partially be attributed to existing variation in the stream. A TSS exceedance occurred downstream at 10 mg/L, which barely exceeds the TSS threshold and the reference sample. Post-construction downstream turbidity and TSS levels were comparable to preconstruction levels. No action was necessary.
Andrew Paden	10/28/2014	13:10	Post-C	MP	812	34º 08' 31" N	118º 45' 33" W	76.42	11.26	8.16	1.27	N/A	<10	No	apparently clear; some small plant debris	medium	6 inches	23 feet	rubble rock	none	
Andrew Paden	10/28/2014	13:20	Post-C	DS	805	34º 08' 31" N	118º 45' 35" W	74.8	8.01	8.09	2.47	Yes	10	Yes	apparently clear; some small plant debris	medium	1 foot	8 feet	dirt/grass	none	

Legend: US: Upstream Pre C: Pre-Construction
MP: Midpoint DC: During Construction
DS: Downstream Post C: Post-Construction

Water Temp WQO:	**DO WQO:**	**pH WQO:**	**Turbidity WQO:**	**TSS Threshold:**
Never an increase of 5 degrees or above 80 degrees	Never less than 5 mg/L	Between 6.5 and 8.5; can't raise more than 0.5	Increases shall not exceed 20% if upstream is between 0 and 50 NTU, and shall not exceed 10% if ambient is greater than 50 NTU	Less than 10 mg/L

Reach 38 (Lindero Canyon Outlet) Sampling Results

Sampler	Date	Time	Type of Sampling Visit	Sampling Location	Altitude (ft)	GPS Points		Water Temp (F)	DO	pH	Turbidity (NTU)	Exceed Turbdity Thresholds?	TSS (mg/L)	Exceed TSS Thresholds?	Visual Observations	Summary/Notes
						Latitude	Longitude									
Paige Anderson	9/25/2014	10:28 AM	Pre C	US	837	34º 08' 34" N	118º 45' 52" W	64.5	13.2	8.29	1.68	Reference	<10	No	Lots of algae on water surface; deep cold water.	A turbidity exceedance did not occur. TSS thresholds were not exceeded. No action was necessary; this data was collected to establish a baseline of water quality parameters in the creek.
Paige Anderson	9/25/2014	10:41 AM	Pre C	MP	847	34º 08' 35" N	118º 45' 51" W	63.4	9.5	8.36	0.99	N/A	<10	No	Algae lining banks and rooted to base of channel; narrow flow.	
Paige Anderson	9/25/2014	10:59 AM	Pre C	DS	852	34º 08' 33" N	118º 45' 51" W	62.8	6.78	8.19	0.96	No	<10	No	Shaded; clear water; banks lined with reeds and leaf litter; no algae.	
Nicolle Steiner	9/29/2014	1:11 AM	DC	US	837	34º 8' 35" N	118º 45' 50" W	64.20	7.85	8.15	1.34	Reference	74	Yes	Standing pool of water in soft bottom channel.	Downstream turbidity exceeded upstream turbidity; however, both values were very low and the downstream exceedance was not determined to be detrimental to channel health. Measures to reduce turbidity in response to the exceedance included installation of two fiber rolls placed across the stream. TSS levels at the upstream and midpoint locations exceeded the TSS threshold; however, downstream TSS was below the threshold. No further action was necessary.
Nicolle Steiner	9/29/2014	1:15 AM	DC	MP	835	34º 8' 35" N	118º 45' 50" W	65.54	7.60	8.02	1.87	N/A	22	Yes	Slow flowing water in soft bottom channel.	
Nicolle Steiner	9/29/2014	1:28 AM	DC	DS	846	34º 58' 33" N	118º 45' 50" W	62.92	7.49	8.03	2.76	Yes	<10	No	Flowing water in soft bottom channel. Two fiber rolls placed on stream. Sample taken downstream of rolls.	
Paige Anderson	10/3/2014	10:20 AM	Post C	US	846	34º 08' 35" N	118º 45' 50" W	61.51	10.82	8.33	1.12	Reference	<10	No	Algae on surface; slow flow.	A turbidity exceedance did not occur. TSS thresholds were not exceeded. No action was necessary.
Paige Anderson	10/3/2014	10:31 AM	Post C	MP	838	34º 08' 35" N	118º 45' 50" W	61.32	9.71	8.1	1.4	N/A	<10	No	Water flowing faster than upstream; narrow channe; algae along banks and within stream.	
Paige Anderson	10/3/2014	10:55 AM	Post C	DS	861	34º 08' 33" N	118º 45' 52" W	60.01	6.79	8.13	1.32	No	<10	No	Narrow flow; shaded; leaf litter along banks; appeared less deep than midpoint; fiber rolls present adjacent to creek	

Legend: US: Upstream; MP: Midpoint; DS: Downstream; Pre C: Pre-Construction; DC: During Construction; Post C: Post-Construction

Water Temp WQO: Never an increase of 5 degrees or above 80	**DO WQO:** Never less than 5.0 mg/L	**pH WQO:** Between 6.5 and 8.5; can't raise more than 0.5 degrees	**Turbidity WQO:** Increases shall not exceed 20% if upstream is between 0 and 50, and shall not exceed 10% if ambient is greater than 50	**TSS Threshold:** No greater than 10 mg/L

2015-16 Maintenance Activities

Dominguez Channel Watershed

Water Quality Monitoring Results (2015-16)

Reach No. and Name	DATE	Sampling Parameters	Sample Location			COMMENT
			Upstream of Project (u/s)	Within Project	Downstream of Project (d/s)	
Reach 26 - Project 74	9/24/2015	TIME	10:25 AM	10:38 AM	10:58 AM	**Baseline/Pre-Work**
		SAMPLE NO.	26-1	26-2	26-3	
		TEMP (°C)	23.38	22.71	23.74	
		pH	7.95	7.1	7	
		Turbidity (NTUs)	3.64	11.1	27.7	
		Dissolved O2 (mg/L)	8.82	0.97	3.3	Debris in and around water at upstream location. Also a lot of plants/leaves in water. The midpoint location has very dark soils on the banks and had a lot of mosquitoes.
		Total Suspended Solids (mg/L)	22	27	29	
Reach 26 - Project 74	9/25/2015	TIME	10:43	11:00	11:20	**During Work**
		SAMPLE NO.	26-1-925	26-2-925	26-3-925	
		TEMP (°C)	22.93	23.02	24.96	
		pH	7.21	7.3	6.94	
		Turbidity (NTUs)	35.3	17.8	33.2	
		Dissolved O2 (mg/L)	4.34	5.06	3.43	
		Total Suspended Solids (mg/L)	19	10	14	
Reach 26 - Project 74	9/29/2015	TIME	10:37	10:59	11:29	**During Work**
		SAMPLE NO.	26-1-929	26-2-929	26-3-929	
		TEMP (°C)	21.59	22.01	25.37	The upstream sampling location had a construction BMP fiber roll in place. Water had some dirt and floating film layer just in front of the fiber roll. many mosquito fish at this location. The midpoint sampling location had a construction BMP fiber roll in place, and the water was stagnant, not flowing, very murky and had no transparency. The downstream sampling location had construction BMPs in place (two sets of sand bags and a fiber roll) and we sampled about 3 feet in front of the roll. These BMPs were implemented after last week's high turbidity level at the downstream. Due to consistent high levels of turbidity at the up and downstream, we assume that the high turbidity is not due to construction and more likely due to natural conditions.
		pH	7.69	6.78	6.83	
		Turbidity (NTUs)	38.1	13.3	44.3	
		Dissolved O2 (mg/L)	8.16	2.6	3.44	
		Total Suspended Solids (mg/L)	67	18	20	
Reach 26 - Project 74	09/30/2015	TIME	9:11	9:37	10:01	**During Work**
		SAMPLE NO.	26-1-930	26-2-930	26-3-930	Turbidity exceedance at downstream again, even with BMPs in place Similar water and flow conditions to yesterday. High turbidity throughout the reach, at each sampling location. Turbidity exceedance was reported to field supervisor. Advised more BMPs to be implemented. Retaken sample still showed turbidity exceedance, despite BMPs. Tubidity exceedance likely due to natural conditions and construction related activity.
		TEMP (°C)	20.86	21.65	22.86	
		pH	7.6	6.64	6.73	
		Turbidity (NTUs)	21.6	30.8	48.8	
		Dissolved O2 (mg/L)	4.77	5.2	8.61	
		Total Suspended Solids (mg/L)	33	11	<10	
Reach 26 - Project 74	01/10/2015	TIME	8:43	9:00	9:42	**During Work**
		SAMPLE NO.	26-1-101	26-2-101	26-3-101	Turbidity exceedance at downstream again, even with BMPs in place Similar water and flow conditions to yesterday. High turbidity throughout the reach, at each sampling location. Turbidity exceedance was reported to field supervisor. Advised more BMPs to be implemented. Retaken sample still showed turbidity exceedance, despite BMPs. Tubidity exceedance likely due to natural conditions and construction related activity.
		TEMP (°C)	20.44	21.52	23.31	
		pH	7.31	6.76	6.75	
		Turbidity (NTUs)	13.9	29.8	42.6	
		Dissolved O2 (mg/L)	5.04	1.15	3.12	
		Total Suspended Solids (mg/L)	10	32	11	
Reach 26 - Project 74	10/02/2015	TIME	8:24	8:36	9:05	**During Work**
		SAMPLE NO.	26-1-102	26-2-102	26-3-102	Turbidity exceedance at downstream again, even with BMPs in place Similar water and flow conditions to yesterday. High turbidity throughout the reach, at each sampling location. Turbidity exceedance was reported to field supervisor. Advised more BMPs to be implemented. Retaken sample still showed turbidity exceedance, despite BMPs. Tubidity exceedance likely due to natural conditions and construction related activity.
		TEMP (°C)	19.43	21.12	21.78	
		pH	7.35	6.78	6.83	
		Turbidity (NTUs)	13.3	47.2	48.7	
		Dissolved O2 (mg/L)	4.45	0.68	2.82	
		Total Suspended Solids (mg/L)	49	12	29	
Reach 26 - Project 74	10/05/2015	TIME	12:25	12:35	12:47	**During Work**
		SAMPLE NO.	26-1-105	26-2-105	26-3-105	
		TEMP (°C)	19.73	18.2	19.2	
		pH	7.2	6.15	6.74	
		Turbidity (NTUs)	36.6	30	24.6	
		Dissolved O2 (mg/L)	4.47	0.72	1.61	
		Total Suspended Solids (mg/L)	21	20	12	High turbidity throughout the reach, at each sampling location. Two sets of sand bags and two fiber rolls in place for BMPs.
Reach 26 - Project 74	10/13/2015	TIME	12:26	12:37	12:58	**During Work**
		SAMPLE NO.	26-1-1013	26-2-1013	26-3-1013	
		TEMP (°C)	74.48	71.03	86.34	
		pH	8.21	7.61	8.9	
		Turbidity (NTUs)	19.8	6.48	11.1	
		Dissolved O2 (mg/L)	7.43	2.25	10.26	
		Total Suspended Solids (mg/L)	35	12	29	Two sets of sand bags and two fiber rolls in place for BMPs.
Reach 26 - Project 74	10/21/2015	TIME	12:53	1:05	1:22	**Post Work**
		SAMPLE NO.	26-1-1021	26-2-1021	26-3-1021	
		TEMP (°C)	70.77	68.65	89.27	
		pH	8.46	7.01	9.53	
		Turbidity (NTUs)	46.7	9.33	7.99	
		Dissolved O2 (mg/L)	8.65	0.66	14.13	Water was mostly stagnant throughout the reach. Lots of floating film and debris at all sampling locations. Algae and floating film layer at downstream.
		Total Suspended Solids (mg/L)	190	69	150	

Malibu Creek Watershed

Water Quality Monitoring Results (2015-16)

Reach No. and Name	DATE	Sampling Parameters	Sample Location			COMMENT
			Upstream of Project (u/s)	Within Project	Downstream of Project (d/s)	
Reach 38 Lindero Creek	18/09/2015	TIME	9:25 AM	9:40 AM	9:50 AM	**Baseline/Pre-Work**
		SAMPLE NO.	38-1 US	38-2 W	38-3 DS	
		TEMP (°C)	65.0 F	64.5 F	63.4 F	
		pH	7.16	7.82	7.69	
		Turbidity (NTUs)	1.46	1.99	2.26	
		Dissolved O2 (mg/L)	8.57	5.35	1.86	
		Total Suspended Solids (mg/L)	< 10 mg/L	< 10 mg/L	< 10 mg/L	Baseline (pre-clearing); no BMPs placed downstream
Reach 38 Lindero Creek	9/23/2015	TIME	8:45 AM	8:52 AM	9:03 AM	**During Work/Last Day of Work**
		SAMPLE NO.	38-1-923	38-2-923	38-3-923	
		TEMP (°C)	64.4 F	64.3 F	64.7 F	
		pH	6.58	6.99	7.25	
		Turbidity (NTUs)	11	1.33	1.37	
		Dissolved O2 (mg/L)	4.5	5.1	1.46	
		Total Suspended Solids (mg/L)	< 10	30	< 10	Construction crew started working. BMP in place at the time of sampling. Very low turbidity at the downstream. Steady flow throughout the reach.
Reach 38 Lindero Creek	9/24/2015	TIME	9:05 AM	9:12 AM	9:19 AM	**Post Work**
		SAMPLE NO.	38-1-924	38-2-924	38-3-924	
		TEMP (°C)	63.48 F	63.89 F	64.12 F	
		pH	6.7	7.12	7.51	
		Turbidity (NTUs)	1.77	1.27	1.43	
		Dissolved O2 (mg/L)	5.78	6.15	2.73	Post-work monitoring; all BMPs removed; u/s and internal turbidity readings were below the respective baseline turbidity levesl; d/s turbidity was within the acceptable 20% limit of the basieline turbidity level.
		Total Suspended Solids (mg/L)	<10	<10	<10	