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Annual Monitoring Summary Report

2007

Freshwater Cleanup and Abatement Order R1-2006-0046

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PROJECT TITLE: FRESHWATER CAO R1-2006-0046 MONITORING PROGRAM

ORGANIZATION IMPLEMENTING THE PROJECT:

PALCO (The Pacific Lumber Company)
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Scotia, CA 95565

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

SCIENCE TEAM LEADER FOR THIS PROJECT

_____ Date _____
Kathleen Sullivan, Ph.D.

PALCO AUTHORIZED REPRESENTATIVE

_____ Date _____
Kathleen Sullivan

2006 Work Plan

A total of 10 sites were scheduled to be completed in 2006 (as per the Freshwater Monitoring QAPP 1.1). Work was scheduled from May through October 15th. The work plan summary for 2006 documents all treatment work conducted under the order and summarizes variations that occurred during the conduct of operations throughout the operating season. The work plan summary is attached in Appendix 1.

These sites included a number of road projects, including but not limited to:

- Removal of Humboldt crossings
- Culvert replacement, removal of crossing fill
- Culvert installation
- Bridge installation
- Construction of water bars

Sites are located on Map 4. Each site number for Freshwater corresponds to the distance in feet on a given road. It is consistent with the listing of sites in the ECP listing in each corresponding THP. Site numbers on this table are consistent with the sediment source inventory submitted on 11/15/2006.

Deviation from Plan

Ten sites were originally scheduled to be completed in 2006 with 2,354 cubic yards of sediment to be treated (as per the Freshwater Monitoring QAPP 1.1). As of November 15, 2006, 16 sites in Freshwater have been completed. These sites totaled 3,032 cubic yards of material saved. Six sites were added to the original Monitoring Plan. Table 1 identifies the sites completed and the monitoring studies selected for each site.

CAO Sites Monitoring Plan

The monitoring plan for the 16 sites completed in the Freshwater Watershed in 2006 is provided in Table 1. Work was scheduled from May through October 15th.

Table 1. Overview of Freshwater Creek CAO Monitoring Plan for CAO sites completed in 2006.

2006 Freshwater Creek CAO Sites Monitoring Plan						
Road #	Site ID #	Sub-basin	Site Completed	Wet Weather Inspection	Erosion Void	Photo Monitoring
N90	9200	South Fork	6/26/2006	X	X	X
N90	10700	Little Freshwater	6/24/2006	X	X	X
U86	5000	South Fork	6/26/2006	X		X
U86.41	600	Upper N. Fork Elk	6/13/2006			
X10	10341	Little Freshwater	6/8/2006		X	X
X10	17300	Little Freshwater	6/6/2006			
X10.99	90	Little Freshwater	6/12/2006	X		
X65.21	3650	Cloney Gulch	9/11/2006	X	X	X
X65.21	3914	Cloney Gulch	9/9/2006	X		
X65.50264041	700	Upper Mainstem	11/6/2006		X	X
X71	7200	Upper Freshwater	8/19/2006	X		X
X71	7850	Graham Gulch	8/31/2006			X
X71.61	2200	Graham Gulch	8/31/2006		X	X
X71.61	3100	Graham Gulch	8/29/2006	X	X	X
X75.4095	1800	Upper Mainstem	8/29/2006	X	X	X
X83	2045	Upper Mainstem	6/5/2006	X		X

Daily Rainfall

Daily rainfall for 2006/ 2007 is as follows in Table 2. Rainfall is recorded in inches and is gathered from the National Weather Service Station in Eureka (www.wrh.noaa.gov/eka).

Table 2. Daily rainfall recorded at NWS station in Eureka, California. Data is presented in inches.

NWS Station at Eureka Hydrologic Year 2006-2007												
Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	July	Aug.	Sep.
1	0.00	0.00	0.01	0.00	0.00	0.20	0.00	0.29	0.00	0.00	0.00	0.00
2	0.00	0.64	0.00	0.01	0.00	0.13	0.00	0.14	0.00	0.00	0.01	0.00
3	0.00	0.86	0.00	0.97	0.00	0.00	0.00	0.31	0.00	0.00	0.01	0.00
4	0.22	0.00	0.00	0.40	0.00	0.00	0.00	0.00	0.19	0.00	0.00	0.06
5	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
6	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
7	0.00	0.66	0.00	0.00	1.03	0.36	0.29	0.00	0.00	0.00	0.00	0.00
8	0.00	0.14	0.26	0.00	0.50	0.00	0.29	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.29	0.00	0.05	0.04	0.00	0.00	0.11	0.00	0.00	0.00
10	0.00	0.60	0.85	0.12	1.32	0.00	0.00	0.00	0.12	0.00	0.00	0.00
11	0.00	0.18	0.70	0.04	0.23	0.00	0.33	0.00	0.00	0.02	0.00	0.00
12	0.00	0.38	0.98	0.00	0.23	0.00	0.10	0.01	0.00	0.00	0.00	0.00
13	0.00	0.58	0.57	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
14	0.02	0.03	0.44	0.00	0.20	0.00	0.76	0.00	0.00	0.00	0.00	0.00
15	0.30	0.43	0.03	0.00	0.52	0.00	0.00	0.01	0.00	0.00	0.00	0.00
16	0.03	0.06	0.14	0.12	0.00	0.00	0.04	0.00	0.00	0.00	0.06	0.00
17	0.00	0.00	0.03	0.00	0.04	0.00	0.36	0.00	0.00	0.88	0.00	0.00
18	0.00	0.00	0.00	0.00	0.12	0.00	0.06	0.00	0.00	0.05	0.00	0.00
19	0.01	0.35	0.00	0.01	0.04	0.62	0.04	0.03	0.00	0.00	0.00	0.00
20	0.00	0.39	0.01	0.00	0.97	0.04	0.00	0.05	0.00	0.00	0.00	0.00
21	0.00	0.44	0.77	0.00	2.32	0.00	0.28	0.00	0.00	0.00	0.00	0.00
22	0.00	0.78	0.00	0.00	0.79	0.00	0.13	0.00	0.00	0.00	0.00	0.00
23	0.00	0.05	0.08	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.01	0.03	0.01	0.79	0.00	0.00	0.00	0.00	0.01	0.00	0.00
25	0.00	0.03	0.73	0.00	0.51	0.26	0.02	0.00	0.00	0.00	0.00	0.00
26	0.00	0.45	0.97	0.00	0.50	0.39	0.00	0.02	0.00	0.01	0.00	0.00
27	0.00	0.14	0.13	0.00	1.16	0.45	0.00	0.02	0.00	0.00	0.00	0.00
28	0.00	0.13	0.00	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.10
29	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.01		0.00	0.00	0.00	0.00	0.00	0.00	0.44
31	0.00		0.00	0.00		0.02		0.00		0.00	0.00	

Post Activity Audits

Audits were conducted on all 16 sites completed this year. All post activity audit field forms are attached in Appendix 2.

Table 3. 2006 Freshwater Creek CAO Sites Audit Results

2006 Freshwater Creek CAO Sites Audit Results					
Road #	Site ID #	Site Completed	Audit Date	Within Time Restrictions	Conforms to permits
N90	9200	6/26/2006	7/17/2006	X	Yes
N90	10700	6/24/2006	7/17/2006	X	Yes
U86	5000	6/26/2006	7/17/2006	X	Yes
U86.41	600	6/13/2006	7/17/2006	X	Yes
X10	10341	6/8/2006	7/17/2006	X	No
X10	17300	6/6/2006	7/17/2006	X	Yes
X10.99	90	6/12/2006	7/17/2006	X	Yes
X65.21	3650	9/11/2006	10/23/2006	X	Yes
X65.21	3914	9/9/2006	10/23/2006	X	Yes
X65.50264041	700	11/6/2006	11/14/2006	X	Yes
X71	7200	8/19/2006	9/22/2006	X	Yes
X71	7850	8/31/2006	9/22/2006	X	Yes
X71.61	2200	8/31/2006	9/22/2006	X	Yes
X71.61	3100	8/29/2006	9/22/2006	X	Yes
X75.4095	1800	8/29/2006	9/22/2006	X	Yes
X83	2045	6/5/2006	7/17/2006	X	Yes

Those sites that did not conform to the permit are listed in Table 4. These sites will have additional corrective actions taken in 2007 or will be monitored over the 2006-2007 winter period and re-evaluated for conformance.

Table 4. Non Conforming CAO Sites Freshwater 2006

Non Conforming CAO Sites Freshwater 2006				
Road Number	Site Number	Proposed Treatment	Variance from Specifications	Proposed Corrective Action
X10	10341	Weaver- Excavate from TOP to BOT restoring natural channel gradient. Install a 24" CMP with a 30' down spout. Make sure all flow is captured above the inlet. Install a critical dip. Ramey- Water from channel is flowing below the current 18" pipe. Clean sediment filtration devices within inside ditch. As feasible, restore channel to its natural gradient. Make sure that the old log fill in the crossing is removed before the pipe is installed.	No down spout installed. Added rock lined channel for \pm 30'	None- Maybe amend THP

Photo Monitoring

Photo Monitoring was conducted on 14 of the 16 sites completed in 2006. The date when photo monitoring has occurred at each site is listed in Table 5. Photo monitoring field forms are attached in Appendix 3.

Due to the considerable number of photographs taken at each site, the photos have been submitted on CD Freshwater CAO R1-2006-0046_1. Photos are indexed on the CD by road and site number. Photographs within each site file are in numeric order and correspond to the SCOPAC assigned file name on the corresponding field sheet for each particular site.

Table 5. Photo-monitoring activity log for 2006 Freshwater CAO sites

Photo-monitoring 2006 Freshwater Creek CAO Sites							
Road #	Site ID #	Site Completed	Post Audit Photo Monitoring	Wet Weather Inspection 1 Photo Mon.	Wet Weather Inspection 2 Photo Mon.	Wet Weather Inspection 3 Photo Mon.	Erosion Void Photo Mon.
N90	9200	6/26/2006	11/20/2006	12/13/2006	4/19/2007		9/11/07
N90	10700	6/24/2006	11/20/2006	12/13/2006	4/19/2007		9/28/07
U86	5000	6/26/2006	11/20/2006	12/13/2006	4/19/2007		N/A
U86.41	600	6/13/2006	N/A	N/A	N/A		N/A
X10	10341	6/8/2006	12/6/2006	N/A	N/A		9/10/07
X10	17300	6/6/2006	N/A	N/A	N/A		N/A
X10.99	90	6/12/2006	N/A	12/15/2006	4/19/2007		N/A
X65.21	3650	9/11/2006	11/20/2006	12/13/2006	4/19/2007		9/12/07
X65.21	3914	9/9/2006	11/20/2006	12/13/2006	4/19/2007		N/A
X65.50264041	700	11/6/2006	12/6/2006	N/A	N/A		9/28/07
X71	7200	8/19/2006	11/20/2006	12/13/2006	4/19/2007		N/A
X71	7850	8/31/2006	11/20/2006	12/13/2006	N/A		N/A
X71.61	2200	8/31/2006	12/6/2006	N/A	N/A		9/13/07
X71.61	3100	8/29/2006	12/6/2006	12/15/2006	4/19/2007		9/13/07
X75.4095	1800	8/29/2006	11/20/2006	12/13/2006	4/19/2007		9/12/07
X83	2045	6/5/2006	11/20/2006	12/13/2006	4/19/2007		N/A

Water Quality Inspections

Wet weather inspections were conducted on all sites that were selected to receive that specific monitoring treatment described in the 2006 workplan and treatment schedule.

The log of wet weather inspection activity including audits and wet weather inspections is provided in Table 6. This table will be updated in each quarterly report.

Wet Weather Inspection field forms are attached in Appendix 4.

Table 6. Monitoring activity log for audits and inspections of sites completed in 2006.

2006 Freshwater Creek CAO Site Inspection Log							
Road #	Site ID #	Site Completed	Post Activity Audit	Wet Weather Inspection 1	Wet Weather Inspection 2	Wet Weather Inspection 3	Erosion Void
N90	9200	6/26/2006	7/17/2006	12/13/2006	4/19/07		9/11/07
N90	10700	6/24/2006	7/17/2006	12/13/2006	4/19/07		9/28/07
U86	5000	6/26/2006	7/17/2006	12/13/2006	4/19/07		N/A
U86.41	600	6/13/2006	7/17/2006	N/A	N/A		N/A
X10	10341	6/8/2006	7/17/2006	N/A	N/A		9/10/07
X10	17300	6/6/2006	7/17/2006	N/A	N/A		N/A
X10.99	90	6/12/2006	7/17/2006	12/15/2006	4/19/07		N/A
X65.21	3650	9/11/2006	10/23/2006	12/13/2006	4/19/07		9/12/07
X65.21	3914	9/9/2006	10/23/2006	12/13/2006	4/19/07		N/A
X65.50264041	700	11/6/2006	11/14/2006	N/A	N/A		9/28/07
X71	7200	8/19/2006	9/22/2006	12/13/2006	4/19/07		N/A
X71	7850	8/31/2006	9/22/2006	12/13/2006	N/A		N/A
X71.61	2200	8/31/2006	9/22/2006	N/A	N/A		9/13/07
X71.61	3100	8/29/2006	9/22/2006	12/15/2006	4/19/07		9/13/07
X75.4095	1800	8/29/2006	9/22/2006	12/13/2006	4/19/07		9/12/07
X83	2045	6/5/2006	7/17/2006	12/13/2006	4/19/07		N/A

Summary of wet weather inspection results for 2006 Freshwater CAO sites

Table 8 provides the wet weather inspection findings. Erosion was observed at 7 sites during the wet weather inspections, and consisted primarily of sloughing, slope failure and exposed mineral soil. Turbidity increases greater than 20% were observed at 10 of the sites. At 5 sites, turbidity increases occurred but no erosion or discharge was visible.

Water samples were taken at all feasible sites during the wet weather inspections using a grab sampling technique. Samples were taken upstream and downstream relative to the road or where appropriate on decommissioned sites. Surveyors took great effort to minimize disturbance to the site during sample collection. In some instances samples could not be taken. The following three sites (Table 7) in Freshwater Creek did not have water samples taken due to lack of substantial flow in the crossings:

Table 7. Summary of Freshwater sites with no water samples taken

2006 Wet Weather Inspection sites with no water samples taken			
Road Number	Site Number	Date samples not taken	Reasons Samples Not Taken
N90	10700	12/13/2007 & 4/19/2007	Not Enough Flow to Take Water Samples
X10.99	90	4/19/2007	Not Enough Flow to Take Water Samples
X75.4095	1800	12/13/2007 & 4/19/2007	Not Enough Flow to Take Water Samples

Table 8. Summary of wet weather inspection results for 2006 Freshwater CAO sites

Wet Weather Inspection Results-- 2006 Freshwater Creek CAO Sites										
Road Number	Site ID Number	Wet Weather Inspection	Daily Rainfall	Date Samples Collected	Upstream NTU	Downstream NTU	NTU Difference	Percent Difference	Type of Erosion Observed	Estimated Amount
N90	9200	12/13/2006	0.57	12/13/2006	49.4	55.0	5.6	11%	No erosion observed	None
N90	10700	12/13/2006	0.57	None	X	X	X	X	No erosion observed	None
U86	5000	12/13/2006	0.57	12/13/2006	18.3	51.5	33.2	181%	Sloughing and slope failure Exposed Mineral Soil Head Cutting	< 1 yard
X10.99	90	12/15/2006	0.03	12/15/2006	114	75.2	38.8	-34%	Water at inlet flowing from Soil Pipes	< 1 yard
X65.21	3650	12/13/2006	0.57	12/13/2006	146	219.0	73.0	50%	No Erosion Observed	None
X65.21	3914	12/13/2006	0.57	12/13/2006	80.3	123.0	42.7	53%	No Erosion Observed	None
X71	7200	12/13/2006	0.57	12/13/2006	43.2	87.6	44.4	103%	Rilling Observed	< 1 yard
X71	7850	12/13/2006	0.57	12/13/2006	25	46.5	21.5	86%	Bank Erosion Exposed Mineral Soil Sloughing, Surface Erosion	1-5 yards
X71.61	3100	12/15/2006	0.03	12/15/2006	43	101.0	58.0	135%	Exposed Mineral Soil	< 1 yard
X75.4095	1800	12/13/2006	0.57	None	X	X	X	X	No Erosion Observed	None
X83	2045	12/13/2006	0.57	12/13/2006	47.3	73.2	25.9	55%	No Erosion Observed	None
N90	9200	4/19/2007	0.04	4/19/2007	7.5	9.6	2.1	28%	No Erosion Observed	None
N90	10700	4/19/2007	0.04	N/A	X	X	X	X	No Erosion Observed	None
U86	5000	4/19/2007	0.04	4/19/2007	6.2	9.5	3.3	53%	Sloughing and Slope failure Exposed Mineral Soil	< 1 yard
X10.99	90	4/19/2007	0.04	N/A	X	X	X	X	No Erosion Observed	None
X65.21	3650	4/19/2007	0.04	4/19/2007	38.5	37.8	-0.7	-1.8%	Exposed Mineral Soil	< 1 yard
X65.21	3914	4/19/2007	0.04	4/19/2007	28.7	44.8	16.1	56.1%	No Erosion Observed	None
X71	7200	4/19/2007	0.04	4/19/2007	38.7	44.2	5.5	14.2%	No Erosion Observed	None
X71.61	3100	4/19/2007	0.04	4/19/2007	26.6	27.8	1.2	4.5%	No Erosion Observed	None
X75.4095	1800	4/19/2007	0.04	N/A	X	X	X	X	No Erosion Observed	None
X83	2045	4/19/2007	0.04	4/19/2007	33	32.5	-0.5	-1.5%	No Erosion Observed	None

Notifications

Observations of sediment discharges to streams during the wet weather inspections are reported to the NCRWQCB. There are several possible outcomes of the inspections that determine when and if notifications are provided.

When the field inspector observes erosion features, such as bank slumps, rilling, etc., they complete a sediment discharge form upon returning from the field. The determination that sediment has been discharged to the stream, or may in the future, is based on observation and inspector judgment. The NCRWQCB is notified in writing, by phone and/or email within 48 hours of the observation consistent with Erosion Control Plan (ECP) reporting protocol. In cases where turbidity samples show significant turbidity increases but no erosion was visible during the inspection, the NCRWQCB is notified of a turbidity discharge via this monitoring report (Table 10).

PALCO operations managers review all types of discharges in a timely manner to determine notification status and corrective action. Table 11 lists the erosion and discharge findings and the PALCO operations follow-up if any.

As per the draft memorandum dated December 5, 2006 by the NCRWQCB, the discharge notifications are summarized in tabular form in Table 9. A map with the locations of these discharges is attached in Appendix 5.

Table 9. Log of Discharge Notifications sent to NCRWQCB for Freshwater

Water Quality Discharge Notifications- Freshwater 2006 CAO Sites							
Road Number	Site Number	Date Discharge Discovered	Amount of Sediment Discharged	Nature and Cause of Discharge	Corrective Action Taken	Date Corrective Action Taken	Corrective Action Applied to Site or Recommendation
X71	7850	1/18/07	3 yards	Culvert Failure	Yes	6/1/06	Temporary fix completed- stabilized area- sealed off inlet- water flowing through culvert. During dry season pipe will be re-installed
X75.4095	1800	5/2/06	1-5 yards	Crossing Erosion	Yes	8/29/06	Decommissioned Crossing
X65.21	3914	6/6/06	1-5 yards	Collapsed bridge stringer	Yes	9/9/06	Installed New Bridge

Table 10. Log of PALCO Notification Activities for 2006 Freshwater Creek CAO sites

Notification Log- Freshwater Creek 2006 CAO Sites							
Road Number	Site ID Number	Wet Weather Inspection	Percent Turbidity Difference	Estimated Erosion Amount	ECP Discharge Notification to NCRWQCB	Date NCRWQCB Notified of ECP Discharges	Date Turbidity Discharges Reported
N90	9200	12/13/2006	11%	None	No	N/A	No
N90	10700	12/13/2006	X	None	No	N/A	N/A
U86	5000	12/13/2006	181%	< 1 yard	No	N/A	1/15/2007
X10.99	90	12/15/2006	-34%	< 1 yard	No	N/A	No
X65.21	3650	12/13/2006	50%	None	No	N/A	1/15/2007
X65.21	3914	12/13/2006	53%	None	No	N/A	1/15/2007
X71	7200	12/13/2006	103%	< 1 yard	No	N/A	1/15/2007
X71	7850	12/13/2006	86%	1-5 yards	No	N/A	1/15/2007
X71.61	3100	12/15/2006	135%	< 1 yard	No	N/A	1/15/2007
X75.4095	1800	12/13/2006	X	None	No	N/A	N/A
X83	2045	12/13/2006	55%	None	No	N/A	1/15/2007
N90	9200	4/19/2007	28%	None	No	N/A	7/15/2007
N90	10700	4/19/2007	X	None	No	N/A	N/A
U86	5000	4/19/2007	53%	None	No	N/A	7/15/2007
X10.99	90	4/19/2007	X	None	No	N/A	N/A
X65.21	3650	4/19/2007	-1.8%	None	No	N/A	N/A
X65.21	3914	4/19/2007	56.1%	None	No	N/A	7/15/2007
X71	7200	4/19/2007	14.2%	None	No	N/A	N/A
X71.61	3100	4/19/2007	4.5%	None	No	N/A	N/A
X75.4095	1800	4/19/2007	X	None	No	N/A	N/A
X83	2045	4/19/2007	-1.5%	None	No	N/A	N/A

Corrective Actions

PALCO operations managers consider a number of factors when determining what corrective actions will be taken. Accessibility and knowledge of site conditions will determine whether foresters or road maintenance crews are dispatched immediately or whether improvements are postponed until drier operating conditions occur to avoid causing additional erosion damage at the site (typically the next summer).

The corrective action activities are listed in Table 11. Sites where activities are delayed are listed as pending.

Table 11. Corrective Action Log for 2006 Freshwater Creek CAO sites

Corrective Action Log- 2006 Freshwater Creek CAO Sites									
Road Number	Site ID Number	Turbidity Difference	Estimated Erosion Amount	Discharge Reported	Operations Notification Date	Operations Person Notified	PALCO Operations Follow-up	Date Completed	Corrective Action Taken
N90	9200	28%	None	No	N/A	N/A	None	N/A	None
N90	10700	X	None	No	N/A	N/A	None	N/A	None
U86	5000	53%	< 1 yard	No	4/20/07	Dave Carter	None	N/A	None
X10.99	90	X	None	No	N/A	N/A	None	N/A	None
X65.21	3650	-1.8%	< 1 yard	No	4/20/07	Dave Carter	None	N/A	None
X65.21	3914	56.1%	None	No	N/A	N/A	None	N/A	None
X71	7200	14.2%	None	No	N/A	N/A	None	N/A	None
X71.61	3100	4.5%	None	No	N/A	N/A	None	N/A	None
X75.4095	1800	X	None	No	N/A	N/A	None	N/A	None
X83	2045	-1.5%	None	No	N/A	N/A	None	N/A	None
N90	9200	11%	None	No	N/A	N/A	None	N/A	None
N90	10700	X	None	No	N/A	N/A	None	N/A	None
U86	5000	181%	< 1 yard	No	12/15/2006	Dave Carter	Completed	12/2006	Hayed, Seeded, Bioengineering
X10.99	90	-34%	< 1 yard	No	12/15/2006	Dave Carter	None	N/A	None
X65.21	3650	50%	None	No	N/A	N/A	None	N/A	None
X65.21	3914	53%	None	No	N/A	N/A	None	N/A	None
X71	7200	103%	< 1 yard	No	12/15/2006	Dave Carter	Completed	12/2006	Hayed, Seeded, Bioengineering
X71	7850	86%	1-5 yards	No	12/15/2006	Dave Carter	Completed	12/2006	Hayed, Seeded, Bioengineering
X71.61	3100	135%	< 1 yard	No	12/15/2006	Dave Carter	Completed	12/2006	Hayed, Seeded, Bioengineering
X75.4095	1800	X	None	No	N/A	N/A	None	N/A	None
X83	2045	55%	None	No	N/A	N/A	None	N/A	None
X75.4095	1800	N/A	< 1 yard	Yes	5/2/06	Dave Carter	Yes	8/29/06	Decommissioned Crossing
X65.21	3914	N/A	< 1 yard	Yes	6/6/06	Dave Carter	Yes	9/9/06	Installed New Bridge

Erosion Void Assessment

Erosion void assessments were conducted on 8 of the 16 sites completed in 2006. Table 6 lists the dates the assessments were conducted. Results are listed in Table 12. Erosion void field forms are attached in Appendix 6.

Table 12. Erosion Void Results for 2006 Freshwater CAO Sites

Road & Site Number	Estimated Cubic Yards Saved/ % Lost	Erosion Feature #	Displaced Volume (yds ³)	Already Delivered Volume (yds ³)	Likely Future Delivery Volume (yds ³)
N90 9200	391/ 0.11%	1	0.197	0.020	0.020
		2	0.234	0.000	0.000
		3	0.016	0.016	0.000
		4	0.400	0.400	0.000
		Total	0.846	0.435	0.020
N90 10700	0	None			
X10 10341	384/ 0.14%	1	0.062	0.000	0.000
		2	1.607	0.321	0.161
		3	0.218	0.022	0.022
		4	0.699	0.210	0.210
		Total	2.587	0.553	0.392
X65.21 3650	40/ 14.69%	1	3.976	3.976	0.000
		2	1.060	1.060	0.000
		3	1.016	0.711	0.305
		4	1.276	0.128	0.128
		5	0.197	0.000	0.010
		Total	7.525	5.875	0.442
X65.50264041 700	454	None			
X71.61 2200	90/ 4.74%	1	0.256	0.102	0.051
		2	0.147	0.074	0.044
		3	4.671	3.737	0.467
		4	0.395	0.356	0.040
		Total	5.469	4.268	0.602
X71.61 3100	285/ 1.64%	1	2.874	2.299	0.575
		2	2.351	1.411	0.941
		3	1.665	0.666	0.9990
		4	0.345	0.293	0.052
		Total	7.236	4.670	2.566
X75.4095 1800	434/ 0.01%	1	0.633	0.063	0.063
		Total	0.633	0.063	0.063

Total Estimated Yards Saved **2078**
 Weighted Average Sediment Lost **0.762%**

Project Problems Encountered and Resolution

There were several minor problems encountered with the implementation of this first set of wet weather inspections. The triggering event can be somewhat difficult to catch. It was found that the weather forecast for that particular day is not necessarily accurate. These decisions are always going to be judgment calls. We'll continue to strive to hit the storm triggers.

Most of the inspectors working on this project do not have an extensive background in road construction. In reviewing some of the erosion findings with the road manager, we decided that it would be beneficial to hold a more detailed training to discuss general road construction and provide a better baseline of knowledge for the inspectors.

There were several inspectors that observed bare mineral soil at the sites. We would ideally like to have inspectors take hay bales, seed, wattles, and a shovel to the wet weather inspection sites, if feasible. This would enable the inspectors to take corrective action when a problem is observed. This could help minimize additional trips to the site to implement the corrective action.

In the first large storm after construction, most of the water samples taken exhibited more than a 20% increase in value from the upstream to the downstream sample for a particular site. The significant turbidity increases may have been caused by these sites being recently constructed and flushing out sediment from operations during these first storms. We expect to see a decrease in the NTU's over time at these sites.

We were unable to compare the two wet weather inspections due to the difference in weather conditions. In the future, comparing the wet weather inspections should help us to find trends in the data that may enable us to evaluate the sites more clearly. We will continue to make improvements to streamline this process. We look forward to analyzing the trends that the sites exhibit over time, and use our knowledge to improve our practices.

Appendices

Appendix 1

2006 Work Plan Summary

Appendix 2

Copies of Post Activity Audit Field Sheets

Appendix 3

Copies of 2006 Photo Monitoring Field Sheets

Appendix 4

Copies of 2006 Wet Weather Inspection Field Sheets

Appendix 5

Copies of 2006 Water Quality Discharge Notifications Map

Appendix 6

Copies of 2007 Erosion Void Field Sheets

CD Freshwater CAO R1-2006-0046_1

Copies of Electronic Files Containing Site Photos and Erosion Void Photos