COUNTY OF HUMBOLDT EXTRACTION REVIEW TEAM (CHERT)

2013 POST-EXTRACTION REPORT

FINAL DRAFT

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For the:

Humboldt County Board of Supervisors

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This is the Final Draft of the CHERT 2013 Post-extraction Report.
Comments received during the 60-day public review period
and CHERT responses are summarized in Appendix B.

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INTRODUCTION

This report presents an overview of the Humboldt County gravel extraction for the 2013 season. Information on mining volumes, methods, and success of mine operators in meeting approved plans is reported herein. Representing Humboldt County, the County of Humboldt Extraction Review Team (CHERT) provided site-specific recommendations on extraction designs submitted by the operators and their consultants, as did agencies with regulatory and oversight responsibilities, including: 1) US Army Corps of Engineers (Corps), 2) National Marine Fisheries Service (NMFS), and 3) California Department of Fish and Wildlife (CDFW). Recommendations were based on field reviews at each site, including reviews of aerial photos and topographic and hydrologic information provided by the operators as required by the US Army Corps of Engineers 2010 Letter of Permission (LOP) and individual permits obtained by several operators. The 2010 LOP and associated documents are the primary federal instruments regulating gravel mining operations in Humboldt County. A new LOP is expected to be issued on expiration of the 2010 LOP.

The Humboldt County Board of Supervisors created CHERT in 1992 to provide scientific oversight to Mad River gravel extraction, which had arrived at an impasse over environmental concerns. Four CHERT members were appointed by the Board with expertise in hydrology, fluvial geomorphology, and river ecology;those same four members continue to serve through the present. In 1996, the scope of CHERT services was expanded to include most riverine extraction sites throughout Humboldt County. Additional details on CHERT's role have been presented in earlier post-extraction reports found at:
http://co.humboldt.ca.us/planning/smara/default.asp?inc=slm.

The annual review process consists of visiting sites in the spring with operators and agency staff to observe post-winter conditions, note undesirable effects from the previous season's extraction (if any), and discuss a possible mining plan for the upcoming extraction season. Later, operators submit air photos, topographic and hydrologic information, and a mining proposal, occasionally followed by a second field review. CHERT then issues a written recommendation, which may suggest changes to reflect either CHERT's or an agency's concerns. Once all parties accept a final iteration of the mining plan, and it is approved by the Corps and CDFW, mining can begin provided all other agency permits have been obtained. In rare occasions, a field review may be done while mining is taking place due to unexpected circumstances that might require alteration to an approved plan. Post-extraction field reviews are conducted after mining is completed in late-summer or fall. Each operator then compiles a post-extraction data set, including pre and post-extraction topographic data, volume calculations, aerial photographs, and other pertinent data. These data are submitted to CHERT, CDFW, Corps, and NMFS.

CHERT develops recommendations based on two primary goals: 1) minimizing potential cumulative effects by ensuring that reach-scale mining volumes do not exceed that which is sustainable, and 2) ensuring that site-specific methods of extraction (skimming, trenching, etc.) are appropriate for protecting local habitat. The concept of 'sustained yield' gravel extraction requires that gravel extraction volumes not exceed mean annual recruitment (an estimate of the long-term average annual supply of gravel to a specific reach of a river). Actual mined gravel

volumes are typically well below mean annual recruitment. Site-specific measures are also recommended by CHERT to reduce both cumulative and localized potential mining effects on riparian and aquatic habitat. These may include, for example, ensuring that skim floor elevations are sufficiently high to maintain low flow channel confinement so that small rises in river stage do not inundate skim surfaces too readily.

With time, experience on the rivers, and interaction with regulatory agencies, mine operators, and other stakeholders, the measures taken to protect river habitat and to improve program functioning are continually being refined. This feedback process, termed 'adaptive management', helps ensure that gravel mining and management improves resource protection, the quality of information provided by mine operators, and program efficiency. Problems occasionally arise, however, when either the river's response to previous mining results in undesirable river habitat conditions, or an operator deviated from an approved mining plan.

In addition to recurring activities (e.g., mining site reviews, extraction recommendations, annual post-extraction report preparation), CHERT occasionally participates in other activities. For example, CHERT prepared a technical analysis of Mad River physical channel conditions, riparian vegetation, and fish habitat in 2009 to support physical and biological assessments required for renewal of federal and state permits. An update to that analysis, including data through 2014, is contemplated prior to issuance of a new Corps permit.

A new gravel mine site was recently permitted by federal regulatory agencies and extracted gravel from the Mad River for the first time in 2011. The operator of this site, the Blue Lake Rancheria, was not required to obtain permits from the State of California or Humboldt County, and consequently, operates outside of the CHERT program. Their mining plans are reviewed by the US Army Corps of Engineers and National Marine Fisheries Service. They receive no CHERT review, nor do they provide mining information to CHERT, so this report contains no information from the Rancheria's mining operations. Consequently, the volume of gravel mined from the Mad River since 2011 has been greater than that reported by CHERT.

Although Eel River cross sections (covering mining reaches in the Lower Eel and Van Duzen rivers, the Middle Reach Eel above Scotia, and the South Fork Eel) have been surveyed since about 1997 and have been used in the annual mining review process, a quantitative, longer-term cross section analysis had not been done until early 2009. As part of the renewal of federal and state permits, a multi-year analysis of cross sections was prepared by CHERT to support impact evaluation and refine protection/mitigation strategies. The Eel River cross section report also provides essential information for updating environmental documentation for Eel River gravel mining. As mentioned above, CHERT reports, including the Eel River cross section analysis, can be found at and downloaded from the Humboldt County Community Development Service's website: http://co.humboldt.ca.us/planning/smara/default.asp?inc=slm .

Humboldt County Instream Gravel Extraction Sites and Extraction Terminology

Table 1 describes the geographic breakdown of Humboldt County mining reaches. CHERT classifies extraction techniques into twelve descriptive categories in Table 2.

Table 1 - Description of river reaches used to sort and report extraction data.

Approximate Length (miles)	River Reaches
7	**Mad River:** The Mad River Reach extends approximately seven miles downstream from the Blue Lake Fish Hatchery to just below the Highway 299 Bridge near Arcata.
6	**Lower Eel River:** The Lower Eel River Reach extends approximately six miles downstream from the mouth of the Van Duzen River to near Fernbridge.
5	**Lower Van Duzen River:** The Lower Van Duzen River Reach extends upstream approximately five miles from the mouth of the Van Duzen River.
26	**Middle Reach of Eel River:** The Middle Reach of the Eel River extends upstream from Scotia (River mile 20) for approximately 26 miles to River Mile 46.
17	**South Fork Eel River:** The South Fork Reach extends from Garberville (River mile 33) upstream to Cooks Valley near the Mendocino County line (River mile 50).
15	**Trinity River Reach:** The Trinity River Reach extends downstream about 15 miles from near Willow Creek into the Hoopa Valley.
	Isolated Sites: Five extraction sites are more or less isolated from the rest of project. These are the *Satterlee Bar* on the main stem of the Eel River at Fort Seward, the *PL Bar* on the Van Duzen River, the *Branstetter Bar* on Bear River, the *Charles Bar* on Larabee Creek, and the *Cook Bar* on the North Fork of the Mattole River.

Table 2. - CHERT extraction methodology terminology and descriptions.

Narrow Shoreline Skim	A skim with one edge close to the low flow channel at or above the 35% flow elevation with a width no greater than 1/3 that of the unvegetated bar surface.
Wide Shoreline Skim	Same as above but wider.
Narrow Offset Skim	A skim that has a substantial vertical or horizontal offset from the low flow channel and a width no greater than 1/3 that of the unvegetated bar surface.
Wide Offset Skim	Same as above, but wider. Some may refer to this as a 'horseshoe' skim.
Overflow Channel Skim	Same as above, but one that is located within a high flow overflow channel
Dry Trench	A relatively long, linear shallow skim that remains above the water table at the time of excavation.
Wet Trench	A trench sufficiently deep to intersect the water table at the time of excavation, designed for high water to flow through the trench.
Deep Alcove	An excavation designed to simulate naturally occurring shoreline pools, typically located at the downstream ends of naturally occurring scour channels on the backside of meanders, that can provide deep cool water during summer months and/or winter high velocity refuge.
Shallow Alcove	Same as above, but to a depth above the water table at the time of excavation.
Fish Access Channel	A channel excavation that may include pools and incorporate large wood designed to temporarily improve fish migration access.
Wetland Pit	A strategically located and designed pit simulating a remnant channel feature, such as an oxbow pond (see Fig. 1); sometimes provided with a small outlet channel.
Terrace Pit	A pit excavated on a low terrace with an outlet provided to allow water to freely enter and exit the pit with changes in river stage.

Fish-friendly Extraction Activities

The primary purpose of gravel mining in Humboldt County is to supply local markets with construction aggregate. Most extractions are designed to do this as efficiently as possible within the constraints of the rules and regulations for minimizing effects on riverine habitat. In addition to habitat protection, habitat improvement has been a consideration in mining plan development. Some years ago, we began recommending (and the operators began excavating) "alcoves", mimicking what we observed the river creating on its own. Alcoves are trenches that typically connect with the main low flow channel at the downstream end of a point bar. Juvenile and adult salmon and steelhead use these features for holding to escape high velocities in the main channel. Juvenile salmonids in particular also benefit from cooler summer water temperatures typically found in alcoves. Figure 1 shows upstream and downstream views of an alcove extraction at the Guynup Site on the Mad River near Blue Lake in 2013. Although disconnected from the river flow at the time the photos were taken, a moderate size flow event, typically occurring each fall, would breach the downstream end and connect the feature with the main channel. A dip was later placed at the downstream berm to hasten connection to the main channel.

Figure 1. Alcove excavated in 2013 at the Guynup Site, Mad River. Left photo is looking downstream, right is looking upstream (photo date Oct. 11, 2013).

Each year, a fish access channel is excavated by Leland Rock on the Van Duzen River delta as part of mining activities. This channel provides fall upstream spawning migration access for adult chinook salmon that would otherwise be impeded by shallow water. To prevent adult salmon from attempting to migrate up the Van Duzen River before flows can sustain upstream adult migration Scott Downie, a local CDFW biologist, installs culverts to block access (Fig. 2). Once flows are high enough to ensure upstream migration, the culverts are pulled and access is restored. In 2013, wood debris was placed in the channel below the culverts to provide cover for salmonids awaiting migration flows.

Figure 2. Looking upstream at temporary culverts installed in 2013 at the mouth of the Van Duzen River to block upstream salmon migration. The culverts are pulled once flows are high enough in the fall to ensure successful migration (photo date Oct. 22, 1013).

Trenches have become a common type of gravel extraction in recent years. As with alcoves, they can offer temporary refuge from high flows in the main channels. Figure 3 shows two views of a trench excavated in the Lower Eel River in 2013. Unlike alcoves, trenches are usually mechanically connected by small breaches with the main channel flow after extraction is completed and suspended sediment has settled out. These extraction features are designed to be short-lived – the expectation is that each winter's flows will fill them in completely. However, that is not always the case if high flows are too low. Without complete replenishment, a site with remnant trenches will soon have reached its extraction limit until high flows re-fill or otherwise obliterate the trenches.

Figure 3. Trench excavated in 2013 along the Lower Eel River main channel. Left photo is at the upstream end, right is at the downstream end (photo date Nov. 6, 2013).

2013 EXTRACTION SUMMARIES

River Reach Extraction Volumes

In 2013, CHERT reviewed 29 extraction areas (some multiple times) distributed among 16 mining sites in Humboldt County (many sites had more than one extraction area). Appendix A provides historical gravel extraction volumes from the beginning of the CHERT program in 1992 (Mad River) and the expansion in 1997 (Eel River, Trinity River, and isolated sites added). As shown in Table 3, the total volume of gravel approved for extraction in 2013 was 362,222 cubic yards (cy). The total volume actually extracted was 226,362 cy, or about 62% of that approved for extraction. As mentioned above, any gravel extraction done by Blue Lake Rancheria is not included in this report.

Table 3. Humboldt County 2013 gravel extraction summary by river reach.

Operator	Site	Area	Method	Approved Volume (cu. yds.)	Extracted Volume (cu. yds.)	Percent of Approved Volume	Extracted Area (acres)
County of Humboldt	North Fork Mattole	Cook Bar	n/a	n/a	n/a	n/a	n/a
County of Humboldt	Larabee Creek	Charles Bar	n/a	n/a	n/a	n/a	n/a
County of Humboldt	Bear River	Branstetter Bar	n/a	n/a	n/a	n/a	n/a
Humboldt County	PL-Van Duzen Bar	Van Duzen Bar	dry alcove	9,000	8,877	99%	0.9
County of Humboldt	Middle Eel River	Dyerville Bar	n/a	n/a	n/a	n/a	n/a
Fort Seward Ranch	Eel River	Satterlee Bar	n/a	n/a	n/a	n/a	n/a
Isolated Sites Totals =	**0**	**0**	**---**	**9,000**	**8,877**	**1**	**0.9**

Tables 4-8 list site-specific 2013 extraction information for each extraction area grouped by river reach. Sites are listed from downstream to upstream in each table. There was no gravel extraction from the Middle Eel River or isolated sites in 2013.

Table 4. Mad River gravel extractions in the 2013 extraction season. The maximum annual volume determined by the NMFS for the Mad River was 78,000 cy and nearly all was extracted. The volumes listed in this table do not include any taken by the Blue Lake Rancheria.

Operator	Sites	Area No.	Method	Approved Volume (cu. yds.)	Extracted Volume (cu. yds.)	Percent of Approved Volume	Extracted Area (acres)
Eureka Ready Mix	O'Neill Bar	1	wide shoreline skim	5,078	5,360	106%	2.1
Miller Family Trust	Miller Bar	A	wide shoreline skim	4,968	4,635	93%	1.9
Miller Family Trust	Miller Bar	B	wide shoreline skim	575	441	77%	0.3
Eureka Ready Mix	Johnson-Spini Bar	1	wide shoreline skim	17,487	17,600	101%	6.7
Eureka Ready Mix	Johnson-Spini Bar	2	wet alcove	2,665	2,798	105%	0.5
Mercer Fraser Co.	Essex Bar	1	wide shoreline skim	3,247	3,224	99%	0.6
Eureka Ready Mix	Leta-Johnson Bar	1B	narrow shoreline skim	5,256	5,436	103%	1.9
Eureka Ready Mix	Christie Bar	3B	narrow shoreline skim	5,555	5,975	108%	1.6
GLJ Construction	Blue Lake Bar	1	narrow shoreline skim	2,203	2,283	104%	0.8
GLJ Construction	Blue Lake Bar	2	wet alcove	2,927	2,539	87%	0.3
GLJ Construction	Blue Lake Bar	3	dry alcove	3,799	3,126	82%	0.8
GLJ Construction	Blue Lake Bar	4	narrow offset skim	4,637	3,061	66%	0.7
Eureka Ready Mix	Emmerson Bar	1	wet alcove	5,750	4,707	82%	0.7
Eureka Ready Mix	Emmerson Bar	2	narrow shoreline skim	1,384	1,468	106%	0.5
Mad River Sand and Gravel	Guynup Bar	1	narrow skim/alcove	9,924	9,165	92%	1.4
Mad River Sand and Gravel	Guynup Bar	2	narrow shoreline skim	5,070	5,101	101%	1.7
River Reach Totals =	**9**	**16**	**---**	**80,525**	**76,919**	**96%**	**22.5**

Table 5. Lower Eel River gravel extractions in the 2013 extraction season.

Operator	Site	Area No.	Method	Approved Volume (cu. yds.)	Extracted Volume (cu. yds.)	Percent of Approved Volume	Extracted Area (acres)
Eureka Ready Mix	Singley Bar	n/a	no extraction proposed	n/a	n/a	n/a	n/a
County of Humboldt	Worswick Bar	n/a	no extraction proposed	n/a	n/a	n/a	n/a
Mallard Pond	Drake Bar	n/a	no extraction proposed	n/a	n/a	n/a	n/a
Mercer Fraser Co.	Sandy Prairie: Plant B	B1	offset skim	11,810	0	0%	n/a
Mercer Fraser Co.	Sandy Prairie: Plant B	B2	offset skim	7,154	0	0%	n/a
Mercer Fraser Co.	Sandy Prairie: Plant B	B3	offset skim	3,345	0	0%	n/a
Mercer Fraser Co.	Sandy Prairie: Plant B	B4	wet trench	46,165	0	0%	n/a
Mercer Fraser Co.	Sandy Prairie: Plant B	B5	wet trench	25,484	15,028	59%	1.2
Mercer Fraser Co.	Sandy Prairie: Plant A	A1	offset skim	53,419	39,798	75%	6.3
Mercer Fraser Co.	Sandy Prairie: Plant A	A2	wet trench	16,575	15,303	92%	1.2
Hansen Truck Shop	Hansen Bar	n/a	no extraction proposed	n/a	n/a	n/a	n/a
Eureka Ready Mix	Hauck Bar	1	dry alcove	9,152	8,684	95%	1.8
Eureka Ready Mix	Hauck Bar	2	wet trench	3,373	2,105	62%	0.5
River Reach Totals =	**2**	**5**	**---**	**176,477**	**80,918**	**46%**	**11.0**

Table 6. Van Duzen River gravel extractions, 2013.

Operator	Site	Area No.	Method	Approved Volume (cu. yds.)	Extracted Volume (cu. yds.)	Percent of Approved Volume	Extracted Area (acres)
Leland Rock	below 101 bridge	B	wet trench	23,280	4,369	19%	0.9
Leland Rock	below 101 bridge	D	wet trench	9,306	7,572	81%	0.9
Leland Rock	below 101 bridge	E	wide offset skim	10,896	10,969	101%	1.5
Van Duzen River Ranch	n/a	n/a	no extraction proposed	n/a	n/a	n/a	n/a
Tom Bess	East Site	1	narrow shoreline skim	14,813	14,182	96%	2.9
Tom Bess	West Site	2	narrow shoreline skim	4,816	4,621	96%	1.1
River Reach Totals =	**3**	**6**	**---**	**63,111**	**41,713**	**66%**	**7.3**

Table 7. South Fork Eel River gravel extractions, 2013.

Operator	Site	Area No.	Method	Approved Volume (cu. yds.)	Extracted Volume (cu. yds.)	Percent of Approved Volume	Extracted Area (acres)
Wallan and Johnson	Wallan and Johnson Bar	n/a	no extraction proposed	n/a	n/a	n/a	n/a
Randall Sand and Gravel	Home Bar	1	wide shoreline skim	26,717	17,212	64%	2.1
Randall Sand and Gravel	Home Bar	2	dry alcove	871	0	0%	0.0
Mercer Fraser Co.	Cooks Valley: MEN *	n/a	no extraction proposed	n/a	n/a	n/a	n/a
Mercer Fraser Co.	Cooks Valley: HUM *	n/a	no extraction proposed	n/a	n/a	n/a	n/a
River Reach Totals =	**1**	**1**	**---**	**27,588**	**17,212**	**62%**	**2.1**

Table 8. Trinity River gravel extractions, 2013.

Operator	Sites	Area No.	Method	Approved Volume (cu. yds.)	Extracted Volume (cu. yds.)	Percent of Approved Volume	Extracted Area (acres)
Mercer Fraser Co.	Willow Creek Site	1	narrow shoreline skim	5,521	723	13%	0.4
Mercer Fraser Co.	McKnight Bar	n/a	no extraction proposed	n/a	n/a	n/a	n/a
Klamath Trinity Aggregates	Rowland Bar	n/a	no extraction proposed	n/a	n/a	n/a	n/a
River Reach Totals =	**1**	**1**	**---**	**5,521**	**723**	**13%**	**0.4**

Humboldt County extraction volumes by method for 2013 are shown in Table 9.

Table 9. Humboldt County gravel extraction volumes and areas by mining method, 2013.

Extraction Method	No. of Areas	Extracted Volume (cy)	Percent of total volume	Area (acres)	Percent of total area
dry alcove	4	20,687	9%	4	8%
wet alcove	3	10,044	4%	2	3%
narrow offset skim	1	42,859	19%	7	16%
narrow shoreline skim	7	48,954	22%	12	28%
terrace pit	1	0	0%	0	0%
wet trench	7	44,377	20%	5	11%
wide offset skim	1	10,969	5%	2	3%
wide shoreline skim	6	48,472	21%	14	31%
Humboldt County Totals =	**30**	**226,362**	**100%**	**44.2**	**100%**

Performance Issues: 2013

To evaluate operator performance and compliance, CHERT, and regulatory agency staff, conducts field reviews in the fall after completion of operations and reviews post-extraction documentation (cross sections, air photos, and other materials) to ensure approved mining plan design specifications were met. By and large, operator performance in conducting their 2013 operations consistent with approved mining plans was very successful. Although most extractions were below their approved volumes, several sites exceeded approved volumes, but only by minor amounts.

At several mined areas, the actual extraction volume was much less than that approved. This does not present a problem as long as the area is left in a condition that meets design objectives (the area will drain effectively after inundation by river flows and so does not have depressions that may trap fish). In past years, we noted instances where the approved volume was met, but the extraction boundaries deviated substantively from approved designs. Where this occurs, channel confinement can be reduced and/or riparian vegetation recruitment areas can be impacted. We noted no areas where this occurred in 2013.

<u>Problems noted in 2013</u>:

- Small patches of leaked equipment fluids were observed during post-extraction field visits. The CDFW representative requested they be cleaned up, and they subsequently were;

- Exclusionary berms were observed at several sites. The operators noted that these were added (and required by OSHA) for safety reasons to prevent river bar visitors from falling into excavations. Although somewhat unsightly, they perform a function and are typically washed away each winter. It was suggested that it would be better to simply create a more gentle bank slope and cease using such berms;

- Waterbars were missing from river bar access roads at one site, as noted by CDFW. The operator was notified and corrective actions taken;

- The density of temporary roads criss-crossing some mining areas seemed excessive for hauling gravel – it was suggested to operators that roads be minimized in the future;

- Some mining sites are routinely used by ‘visitors’ for trash disposal despite efforts to limit this by operators. Trash includes large pieces of metal and other debris. It was suggested that operators coordinate with the County of Humboldt Department of Public Works for trash clean up and disposal.

APPENDIX A: HISTORICAL EXTRACTION VOLUME SUMMARIES

Humboldt County Totals ("---" means unknown)

Year	Approved Volume (cubic yards)	Extracted Volume (cubic yards)	Percent
1992	---	---	---
1993	---	---	---
1994	---	---	---
1995	---	---	---
1996	---	---	---
1997	---	---	---
1998	1,075,095	820,952	76%
1999	1,142,212	860,974	75%
2000	987,848	706,234	71%
2001	979,515	494,819	51%
2002	1,023,866	748,461	73%
2003	881,090	581,800	66%
2004	692,020	440,710	64%
2005	664,565	493,240	74%
2006	700,660	561,845	80%
2007	784,108	612,132	78%
2008	659,022	534,821	81%
2009	454,213	211,207	46%
2010	562,303	374,313	67%
2011	774,582	505,805	65%
2012	553,704	384,514	69%
2013	362,222	226,362	62%
Totals	**9,590,001**	**6,855,988**	**71%**
Averages	**815,886**	**572,424**	**70%**

Mad River ("---" means unknown)

Year	Approved Volume (cubic yards)	Extracted Volume (cubic yards)	Percent
1992	115,000	115,000	100%
1993	122,100	138,400	113%
1994	134,500	134,898	100%
1995	210,637	226,265	107%
1996	203,998	189,517	93%
1997	252,926	210,976	83%
1998	265,795	223,352	84%
1999	196,212	174,974	89%
2000	204,748	146,534	72%
2001	199,215	167,719	84%
2002	204,991	171,937	84%
2003	150,390	136,790	91%
2004	156,540	141,250	90%
2005	138,475	127,200	92%
2006	174,245	162,360	93%
2007	165,504	153,341	93%
2008	142,043	130,613	92%
2009	0	0	n/a
2010	111,439	86,246	77%
2011	147,380	143,124	97%
2012	111,317	100,329	90%
2013	80,525	76,919	96%
Totals	**3,037,319**	**2,751,126**	**91%**
Averages	**165,724**	**149,335**	**90%**

APPENDIX A (continued)

Lower Eel River ("---" means unknown)

Year	Approved Volume (cubic yards)	Extracted Volume (cubic yards)	Percent
1992	---	---	---
1993	---	---	---
1994	---	---	---
1995	---	---	---
1996	---	---	---
1997	561,700	326,500	58%
1998	399,100	273,000	68%
1999	471,400	290,500	62%
2000	291,300	208,600	72%
2001	389,900	119,300	31%
2002	387,300	220,000	57%
2003	318,300	163,900	51%
2004	188,840	120,305	64%
2005	199,370	166,280	83%
2006	235,495	208,240	88%
2007	243,097	177,334	73%
2008	237,955	215,760	91%
2009	229,386	106,467	46%
2010	208,286	188,730	91%
2011	301,537	214,730	71%
2012	226,520	188,994	83%
2013	176,477	80,918	46%
Totals	**3,923,757**	**2,489,719**	**63%**
Averages	**311,531**	**198,923**	**64%**

Middle Eel River ("---" means unknown)

Year	Approved Volume (cubic yards)	Extracted Volume (cubic yards)	Percent
1992	---	---	---
1993	---	---	---
1994	---	---	---
1995	---	---	---
1996	---	---	---
1997	147,300	84,900	58%
1998	157,900	99,400	63%
1999	134,900	124,900	93%
2000	160,100	131,000	82%
2001	116,100	64,000	55%
2002	132,767	121,608	92%
2003	74,030	54,060	73%
2004	0	0	n/a
2005	0	0	n/a
2006	0	0	n/a
2007	89,990	64,424	72%
2008	0	0	n/a
2009	0	0	n/a
2010	0	0	n/a
2011	76,715	35,618	46%
2012	29,569	25,880	88%
2013	0	0	n/a
Totals	**1,013,087**	**744,292**	**73%**
Averages	**72,363**	**53,164**	**73%**

APPENDIX A (continued)

South Fork Eel River ("---" means unknown)

Year	Approved Volume (cubic yards)	Extracted Volume (cubic yards)	Percent
1992	---	---	---
1993	---	---	---
1994	---	---	---
1995	---	---	---
1996	---	---	---
1997	67,700	74,700	110%
1998	75,400	70,100	93%
1999	85,400	75,900	89%
2000	75,700	53,700	71%
2001	66,000	43,100	65%
2002	58,163	48,122	83%
2003	87,060	54,660	63%
2004	80,730	50,745	63%
2005	82,770	36,480	44%
2006	92,000	35,075	38%
2007	90,737	73,956	82%
2008	32,358	24,833	77%
2009	40,170	24,986	62%
2010	42,864	27,732	65%
2011	36,063	14,244	39%
2012	19,039	0	0%
2013	27,588	17,212	62%
Totals	**894,018**	**641,371**	**72%**
Averages	**69,789**	**49,578**	**71%**

Van Duzen River ("---" means unknown)

Year	Approved Volume (cubic yards)	Extracted Volume (cubic yards)	Percent
1992	---	---	---
1993	---	---	---
1994	---	---	---
1995	---	---	---
1996	---	---	---
1997	120,000	81,600	68%
1998	119,100	103,700	87%
1999	159,900	108,800	68%
2000	194,800	121,300	62%
2001	161,700	85,600	53%
2002	202,500	167,400	83%
2003	175,100	123,000	70%
2004	179,045	92,610	52%
2005	159,090	123,170	77%
2006	134,910	104,750	78%
2007	152,773	113,184	74%
2008	209,176	137,850	66%
2009	175,132	73,236	42%
2010	169,041	69,917	41%
2011	175,724	71,903	41%
2012	142,191	47,760	34%
2013	63,111	41,713	66%
Totals	**1,968,094**	**1,362,964**	**69%**
Averages	**165,162**	**107,580**	**65%**

APPENDIX A (continued)

ver ("---" means unknown)			Isolated Sites ("---" means unknown)			
Approved Volume (cubic yards)	Extracted Volume (cubic yards)	Percent	Year	Approved Volume (cubic yards)	Extracted Volume (cubic yards)	Percent
---	---	---	1992	---	---	---
---	---	---	1993	---	---	---
---	---	---	1994	---	---	---
---	---	---	1995	---	---	---
---	---	---	1996	---	---	---
47,500	40,000	84%	1997	---	---	---
35,000	28,100	80%	1998	22,800	23,300	102%
64,300	66,900	104%	1999	30,100	19,000	63%
18,000	22,200	123%	2000	43,200	22,900	53%
46,600	15,100	32%	2001	0	0	n/a
38,145	19,394	51%	2002	0	0	n/a
76,210	49,390	65%	2003	0	0	n/a
62,075	32,700	53%	2004	24,790	3,100	13%
64,100	30,570	48%	2005	20,760	9,540	46%
64,010	51,420	80%	2006	0	0	n/a
42,007	29,893	71%	2007	0	0	n/a
12,490	11,701	94%	2008	25,000	14,064	56%
0	0	n/a	2009	9,525	6,518	68%
30,673	1,688	6%	2010	0	0	n/a
37,163	26,186	70%	2011	0	0	n/a
25,068	21,551	86%	2012	0	0	n/a
5,521	723	13%	2013	9,000	8,877	n/a
570,437	**397,368**	**70%**	**Totals**	**166,650**	**91,904**	**55%**
42,936	**28,504**	**66%**	**Averages**	**13,552**	**7,571**	**56%**

APPENDIX B: COMMENTS ON DISCUSSION DRAFT AND RESPONSES

The sole commenter on the report was the Environmental Law Foundation (ELF), a law firm based in Oakland, CA. In their comment letter dated 30 May, 2014, comments were made pertaining to seven issues. Six of these focus on the 2013 post-extraction report and one deals with a broader issue concerning the expiration of the US Army Corps of Engineers (USACOE) 2009 Letter of Permission (LOP), expiring in December, 2014, and the issuance of a subsequent LOP (most likely to be called the 2015 LOP). We note that this issue is not pertinent to the 2013 post-extraction report, but we provide responses as a courtesy to the commenter. Responses to individual comments are given below in the format submitted (some of the commenter's questions are abbreviated or paraphrased).

Leaked equipment fluid:

1. *What fluids were spilled?* Hydraulic fluid.

2. *What was the volume of each spill, and what was the total volume of spilled fluids?* The spills noted in the 2013 post-extraction report were very small. One of the spills covered no more than two square feet of dry gravel bar (Blue Lake Bar, Mad River). The volume is unknown, but likely did not exceed one quart of fluid. At the other site (Bess site, Van Duzen River), the spill consisted of droplets dispersed over a larger area. The total volume of spilled fluids is estimated to be no more than two gallons for the two sites where spills were observed.

3. *How many spills were observed?* At two sites; one spot at the Blue Lake Bar, and several smaller spots at the Bess site.

4. *On which sites were these spills observed?* The Bess site on the Van Duzen River and the Blue Lake Bar on the Mad River.

5. *Has monitoring been performed ….?* Yes, through our post-extraction site visits, which are done before rainfall events that could cause discharge of fluids into the river or groundwater. The spill at the Blue Lake Bar consisted of a single spot on a dry gravel bar. It was cleaned up and properly disposed of within two hours of discovery. The clean up occurred well before any rainfall event, thus no fluids reached any watercourse, thus there were no discharges. The dispersed nature of spills at the Bess site required a front-end loader for clean up. The fluids were removed from the river bar within several days of their discovery and were properly disposed of well before any rainfall event, thus no fluids reached any watercourse, thus there were no discharges of fluids.

6. *Are operators complying with all of the conditions of the LOP?* To the best of CHERT's knowledge, yes. The authors of the LOP (USACOE) and supporting biological opinion (BO) developed by the National Marine Fisheries Service (NMFS) should be consulted for further information.

7. *Has monitoring been performed during the mining season to ensure the operators are in compliance?* Pre- and post-extraction site visits are performed by CHERT and regulatory agencies to ensure compliance with the governing regulations. Other site visits may be performed in response to specific requests. Regulatory agencies may conduct other site visits of which CHERT is not aware.

8. *Did the operators contact CHERT and the NMFS and implement a spill clean-up plan?* CHERT was not notified. The spills were discovered during post-extraction field reviews at the two sites. CHERT has no knowledge as to whether or not the operators contacted any other organization regarding this issue. As noted above, clean up at both sites occurred almost immediately after discovery.

9. *Has the Water Board been notified of these violations?* Yes, but only recently. The primary responsibility for notifying regulatory agencies rests with individual operators.

10. *What steps have CHERT and the operators taken to ensure that such spills do not occur in the future?* Because they were first noted in 2013, CHERT will henceforth pay special attention to looking for spills in the future. All

operators will be notified that: 1) all heavy equipment shall be maintained in a condition to avoid future spills of any fluids, 2) when a spill occurs, CHERT and regulatory agencies will be immediately notified, and 3) the provisions of their spill clean-up plans shall be immediately implemented.

We note that the regulatory agencies, not CHERT, have the primary responsibility for requiring spill prevention and clean-up plans and enforcement, but more effective and timely communications among all parties will be implemented in all future mine operations and inspections.

We also note that proper maintenance can prevent slow leaks, but it is virtually impossible to predict when a hydraulic hose might burst. Thus spills are not always preventable, but they should be cleaned up as soon as they occur or as soon as they are observed.

Exclusionary Berms

11. *Please provide information on the size, composition and location of these berms*. They were observed at the Leland Rock and Hauck Bar sites on the Van Duzen River. They were composed of unsorted river gravel and stood about three feet tall and of varying widths. As stated in the post-extraction report, the berms were required as safety measures by the Mine Safety and Health Administration to prevent injury to the public. The berms will not be used again because an alternative means to achieve the same objective was adopted in 2014. This consists of using gentler side slopes around extraction areas.

12. *Has any analysis been performed on these berms' effects on sedimentation, turbidity, or river morphology?* Yes, the berms mentioned in the 2013 post-extraction report were washed away by each winter's high flows. This was observed to be the case this spring upon re-visiting the sites. During high winter stormflows that inundated the berms, the river's water is already quite turbid, and the relatively clean gravel composing the berms would not add measurably to turbidity or affect river morphology. As mentioned above, the berms are no longer used.

13. *Has the Corps been notified of this violation of the LOP?* CHERT does not believe this was a violation of the LOP. The authors of the LOP (USACOE) and supporting biological opinion (NMFS) should be consulted for further information.

Trash Dumping

14. *What sites were affected?* Eel River sites, including the Sandy Prairie and Leland Rock sites. We note that on occasion the operators voluntarily clean up trash left by the public on their sites. Because public access is mandated by the California Coastal Act, preventing illegal trash dumping is not an option.

15. *What was the volume of trash?* We do not know, but note that it varies continually as old trash is cleaned up and new trash is dumped.

16. *Has analysis been performed to establish whether the trash has resulted in discharges into the river?* No analysis has been performed, but some locations of trash dumping lie within the annually inundated area, so one could assume that it has.

Excessive Road Building

17. *On what sites were these roads constructed?* This was a pre-existing haul road that had been widened to accommodate two-way traffic, a safety measure, at the Blue Lake Bar. We note that this observation was not made by CHERT, but by agency staff participating in the site review. Thus the term 'excessive' did not come from CHERT, but we attempt here to answer these questions as best we can. We note that the agency person making the comment was apparently mistaken in her assessment; the road in question was not a new one, but rather an existing one that had been widened.

18. *What was the areal and linear extent of the excessive road building?* An existing, permitted road atop a flat terrace was widened by about five feet along about a 500 foot long segment. Thus the area of widening is estimated at about 2500 square feet, or 0.06 acres.

19. *Do photos exist of the excessive roads exist?* Not in the possession of CHERT.

20. *Has analysis been performed of the possible sedimentation, turbidity or morphological effects?* No, but field conditions suggest no detectable effects would have occurred because the widened road segment is above the frequently inundated portion of the river bar. Thus, the affected area is only submerged during floods when water is quite turbid, so any additions of sediment or turbidity from the affected area would be so small as to be unmeasurable.

Cross Section Data

21. *Does CHERT have plans to update the 2009 Eel River cross section analysis?* Not at this time.

22. *Is the raw cross section data available?* The NMFS collects and organizes these data. CHERT will be relying on the NMFS dataset for analyses and suggests the commenter contact them for the data.

23. *Have fish access channels been evaluated for effectiveness?* As observed by Dennis Halligan, fish biologist with Stillwater Sciences, and reported to CHERT on 10 July, 2014: "Prior to the development of the fish access channel gravel extraction technique, adult Chinook salmon were occasionally observed stranded on the Van Duzen River delta downstream of Highway 101 during the early part of the upstream migration season. These stranding events also occurred prior to initiation of gravel mining at the site in 1998. Since the start of annual construction of the fish access channel at this location in 2002, no adult salmonid stranding events have been observed."

24. *Have salmonids been observed using these channels?* Dennis Halligan again: "Fish have been observed using the access channel on the Van Duzen River delta by a number of individuals including CDFW staff and private fisheries biologists." CHERT has also observed adult Chinook salmon using the Van Duzen River fish access channel.

25. *Has monitoring been performed to establish benefits to water cooling?* Halligan: "Direct water temperature monitoring using data loggers has not been performed to determine if constructed alcoves are as cool as natural alcoves. However, many dives have occurred since 2004 during which juvenile salmonids have been observed using constructed and natural alcoves. The divers have observed water temperatures in constructed and natural alcoves that are typically several degrees cooler than the mainstem river. The purpose of the constructed alcoves is to provide cool water refugia for juvenile salmonids seeking to escape the higher water temperatures in the mainstem river. The cool water is supplied by hyporheic flow *[subsurface water seepage]* through the upstream gravel bar."

26. *Are sediment grain sizes comparable between natural and constructed alcoves?* Halligan: "Yes". CHERT would expect that initially (immediately following excavation) that grains sizes in constructed alcoves would be coarser than in natural alcoves. But following a storm event, they would be similar as suspended sediment settles out in the constructed alcoves.

27. *Have salmonids been observed using these constructed alcoves?* Halligan: "Yes, see response to comment 25 above." CHERT has also observed juvenile steelhead in constructed alcoves during the summer, but a systematic field study of juvenile use of or presence in natural versus constructed alcoves has not been done. This would make an interesting and useful master's thesis project.

28. *Low flow effects and extraction limits?* CHERT has not done an analysis of the effects of recent low flows beyond observations made during site visits. CHERT no longer performs estimates of annual extraction volume ceilings. That is now done by NMFS, and does take into account the magnitude of winter stormflows.

29. *Trenches and replenishment*. CHERT has expressed to the NMFS that unless and until previous years' trenches have filled completely, no further trenching should occur in close proximity. NMFS believes otherwise, and trenching repeatedly at the Sandy Prairie site has led to channel braiding, a potentially negative impact for salmonids in CHERT's estimation. CHERT hopes this issue can be resolved, but until then CHERT will continue to recommend against new trenching in areas where the remnants of previous trenches remain.

Preparations for the Expiration of the LOP

30. *What are CHERT's plans for the regulatory process leading to the renewal of the LOP?* CHERT will be preparing an updated analysis of Mad River monitoring data to support the LOP update.

31. *Has relevant communication occurred regarding the update?* Yes. The USACOE, the lead agency, convened a meeting on 26 March, 2014, and held a conference call on 21 May, 2014, including the LOP update as subject matter. CHERT directs questions to the USACOE, the lead agency, for further information.