

Final Report to the U.S. Environmental Protection Agency on Cyanotoxin  
Accumulation in Fish and Freshwater Mussels of the Klamath River

Water Quality Cooperative Agreement CP 96941301-2



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The report can be accessed on line at  
[http://www.waterrights.ca.gov/FERC/ceqa\\_projects.html](http://www.waterrights.ca.gov/FERC/ceqa_projects.html)

## Introduction

The Klamath River is one of the major salmon rivers on the West Coast of the United States. The Klamath River begins at Upper Klamath Lake in Oregon and enters the Pacific Ocean about 250 miles downstream in California. Below Upper Klamath Lake the river flows through a series of reservoirs that are part of the Klamath Hydroelectric Project. PacifiCorp owns and operates the project and is currently in the process of relicensing the project with the Federal Energy Regulatory Commission (FERC). Iron Gate and Copco Reservoirs, at about river miles 190 and 198 respectively, have been the focus of a number of studies starting in 2004 after high concentrations of the cyanotoxin microcystin were measured in Copco Reservoir. These reservoirs produce ideal conditions for the growth of large populations of cyanobacteria, including *Microcystis aeruginosa*. *Microcystis aeruginosa* and microcystin, the cyanotoxin it produces, has been studied extensively in the Klamath River since 2005. Some of the highest levels of microcystin ever recorded in the world have been measured in samples from Copco Cove in Copco Reservoir (Kann and Corum 2007).

High levels of microcystins can produce chronic and lethal health effects in humans and animals. Microcystins are the most commonly detected cyanotoxin across the globe (Blue Green Algae Work Group 2008). Cyanobacteria that are known to produce microcystins include *Microcystis*. Microcystins are cyclic heptapeptides with about 60 known structural variants that have significant influence on the toxicity and physio-chemical properties of the toxin. The most studied and common variant is microcystin-LR. The mechanism of toxicity of microcystins is the inhibition of protein phosphatases, which can cause internal hemorrhaging of the liver. Exposure to microcystins has the potential to cause acute and chronic injury, depending on the dose and duration of exposure. Microcystins are considered to be tumor promoters based on studies in mice that were initiated with a known carcinogen (Blue Green Algae Work Group 2008).

The Klamath River in California is listed as an impaired water body on the Clean Water Act (CWA) section 303(d) list for sediment, microcystin toxin, temperature, nutrients and dissolved oxygen. The US Environmental Protection Agency (USEPA) added the Klamath River segment including Iron Gate and Copco Reservoirs as impaired for microcystin toxin in May 2008. The North Coast Regional Water Quality Control Board (NCRWQCB) is in the process of developing a Total Maximum Daily Load (TMDL) for the Klamath River. Before the FERC can issue a new license for the Klamath Hydroelectric Project, PacifiCorp must obtain water quality certification, under section 401 of the CWA, from the State Water Resources Control Board (State Water Board). PacifiCorp has applied for water quality certification and the State Water Board is currently preparing an Environmental Impact Report.

## Study Background

In 2007 the State Water Board, Division of Water Rights, received funding through a Water Quality Cooperative Agreement (CP 96941301-2) from the USEPA for the analysis of fish tissue and water from the Klamath River for the presence of the microcystin. The State Water Board entered into a contract with the San Jose State University Foundation/California Department of Fish and Game Water Pollution Control Lab (WPCL) to collect fish and analyze samples for microcystins. The WPCL is certified/registered as a State environmental testing laboratory pursuant to the provisions of the California Environmental Laboratory Improvement Act of 1988. The WPCL developed and validated a liquid chromatography-electrospray ionization tandem mass spectrometry (LC-ESI-MS/MS)

method to identify and quantify trace levels of cyanotoxins or microcystins in water, bivalves and fish tissue with enhanced sensitivity and specificity. The method enables confirmation and quantification of six microcystins (MC-LA, LF, LR, LW, RR and YR) with a single chromatographic run. The applied chromatography also allows determination of certain MC metabolites (Demethyl-LR and -RR).

This study had three primary objectives. The first objective was to perform a screening level analysis of microcystin accumulation in a range of aquatic species. The second objective was to provide microcystin levels in yellow perch to the Office of Environmental Health Hazard Assessment (OEHHA) that could be used to develop a public fish tissue consumption advisory. The third objective was to provide support for other studies by analyzing water samples for microcystin. Prior to collecting the yellow perch samples, State Water Board staff discussed with OEHHA staff the quantity of samples necessary to capture the range of variability between samples that is required to conduct a risk assessment and establish fish tissue advisories. Other than a study that showed trace amounts of microcystin in a few steelhead livers (Fetcho 2006), this is the most extensive study of microcystin accumulation in aquatic species of the Klamath River. The lack of existing information on microcystin accumulation in aquatic species in the Klamath River necessitated a flexible study design.

Yellow perch and freshwater mussels were the primary species targeted for this study. Yellow perch are the most abundant species in Iron Gate and Copco Reservoirs, and are a popular sport fish. The California Department of Fish and Game (DFG) does not impose catch limits for yellow perch, and catches of 50-100 yellow perch per day are not uncommon (Fish Sniffer and VisitUSA). High catch rates and a lack of limits may result in some individuals consuming large numbers of yellow perch. Consumption of yellow perch containing microcystin can cause chronic or acute health effects, depending on the toxin level, quantity consumed, and length of exposure.

The Karuk, Hoopa, and Yurok Tribes have lived on the Middle and Lower Klamath, and Trinity Rivers since time immemorial. Tribal people relied heavily on fish and other traditional foods, including freshwater mussels. Freshwater mussels (or clams) were a part of the traditional diet of tribal people on the Klamath River (Norgaard 2004). Anecdotal information indicates some tribal members may still collect and consume mussels from the Klamath River. River otters, raccoons, and other species also rely on mussels as a food source. Consumption of mussels containing microcystin can cause chronic or acute health effects, depending on the toxin level, quantity consumed, and length of exposure.

Mussels are very sensitive to environmental changes and may be indicators of degradation. Freshwater mussels are very long-lived species, and *Margaritifera falcata* (western pearlshells) can live for over a century. Almost three-quarters of all 297 native freshwater mussel species in North America are imperiled and almost 35 are extinct (Nedeau, Smith, and Stone). Mussels are one of the most endangered groups of animals on Earth, yet little is known about their life history, and habitat needs. The greatest threats to *Margaritifera falcata* come from water diversion projects for irrigation, power generation, and water supply, particularly in Washington, Oregon, Idaho, and California. *Gonidea angulata* (western ridged mussels) have been extirpated throughout their original range in California, particularly in southern California and the Central Valley. They have also been extirpated from many sites in the Snake and Columbia watersheds (Nedeau, Smith, and Stone).

Yearling Chinook salmon were also targeted for this study. Fish in the Iron Gate Hatchery are raised in water released from a mid-level outlet located in Iron Gate Dam. Constant

exposure to reservoir water makes these fish an ideal sentinel species for microcystin accumulation. Microcystin in hatchery fish could affect their overall health and resistance to endemic diseases such as *Ceratomyxa shasta* and *Parvicapsula minibicornis*.

The first collection of yellow perch and mussels was timed to correspond with the summer/fall period when the microcystin level is the highest in Iron Gate and Copco Reservoirs. After the first analysis of mussels and yellow perch showed high levels of microcystin, a second collection was developed and timed for a period when levels of microcystin is low. This analysis was designed to show if microcystin is stored for long periods in tissue or if depuration is occurring.

### Sample Collection

Samples were collected by a number of different parties. Table 1 is a catalog of the samples analyzed during this study. WPCL staff collected yellow perch from Iron Gate and Copco Reservoirs in 2007. Tim Wilhite with the USEPA collected yellow perch in 2008. Dr. Kari Norgaard with Whitman College, and Susan Corum with the Karuk Tribe of California collected mussels. Water samples were originally collected by Susan Corum with the Karuk Tribe and later submitted by the USEPA Region 9 laboratory.

Table 1 – Catalog of Samples

TYPE OF SAMPLE	DATE COLLECTED	LOCATION COLLECTED
6 Chinook Salmon	August 13, 2007	Iron Gate Hatchery
1 <i>Gonidea angulata</i>	July 11, 2007	Klamath River near I-5
1 <i>Gonidea angulata</i>	July 20, 2007	Klamath River near Seiad Valley
1 <i>Gonidea angulata</i>	July 24, 2007	Klamath River near Big Bar River Access
1 Unknown Mussel	July 24, 2007	Klamath River near Big Bar River Access
13 Mussels (composite)	July 20, 2007	Klamath River
18 Yellow Perch (18 tissue, 3 liver composite)	September 7-8, 2007	Copco Reservoir, three locations
18 Yellow Perch (18 tissue, 3 liver composite)	September 7-8, 2007	Iron Gate Reservoir, three locations
3 Mussels	November 5, 2007	Klamath River at China Camp across from Happy Camp
3 Mussels	November 5, 2007	Klamath River at Brown Bear below Scott River
3 Mussels	November 5, 2007	Klamath River .5 miles above Seiad Valley
3 Mussels	November 5, 2007	Klamath River below I-5 Bridge
3 Mussels	November 6, 2007	Klamath River under Orleans Bridge
8 Yellow Perch (8 tissue, 1 liver composite)	June 12, 2008	Copco Reservoir at Copco Cove
8 Yellow Perch (8 tissue, 1 liver composite)	June 12, 2008	Copco Reservoir at Mallard Cove
9 Water Samples	July 23 and 24; August 21, 22, 23; September 18 and 19	Iron Gate Reservoir, Copco Reservoir, and Klamath River

## Sample Results

The WPCL reports eight different analytes or congeners of microcystin, including RR, Demethyl-RR, LR, Demethyl-LR, YR, LA, LW, and LF. The tables below list total microcystin levels in nanograms per gram as an efficient way to evaluate and compare sample results. Total microcystin was calculated by summing reported levels for each of the analytes. There was variation in the type and levels of the analytes, and for this reason the complete lab sheets are included with this report. As stated above, sampling was divided into a period when toxin levels are typically high (e.g. late summer), and a period when levels are usually low (e.g. fall, winter, and spring).

### Summer Bloom Period Samples

Yearly Chinook salmon were collected by DFG staff at the Iron Gate Hatchery (Table 2). These fish were from eggs collected in the fall of 2006.

Table 2 – Yearling Iron Gate Hatchery Salmon Summer 2007

Lab #	Date Collected	Tissue Type	Total Microcystin (ng/g)
L-463-07-01	8/13/2007	Fish Liver	301
L-463-07-01	8/13/2007	Fish Stomach	Non-detectable
L-463-07-01	8/13/2007	Fish Fillet	Non-detectable

Mussels were collected from five locations by Dr. Kari Nordaard starting at the Interstate 5 (I-5) Bridge downstream to the Big Bar River access (Table 3). Results show a general trend, with the highest concentration of microcystin at the I-5 location, and lower concentrations downstream. Due to the small sample size additional samples are needed to confirm this trend. A composite of 13 mussels, collected from various locations in the Middle Klamath River was also analyzed.

Table 3 – Mussels Summer 2007

Lab #	Date Collected	Species	Total Microcystin (ng/g)
L-405-07-1	7/11/2007	Gonidea angulata	2,803.1
L-405-07-2	7/11/2007	Gonidea angulata	412.54
L-405-07-2Dup	7/11/2007	Gonidea angulata	383.35
L-405-07-3A	7/11/2007	Gonidea angulata	889.8
L-405-07-3B	7/11/2007	Unknown	201.2
L-405-07-13	7/20/2007	13 Gonidea angulata	57
L-405-07-Dup	7/20/2007	13 Gonidea angulata	32.3
L-405-07-Trip	7/20/2007	13 Gonidea angulata	34.2

Yellow perch were collected from three locations by the WPCL, representing a lower, middle and upper section, in both Iron Gate and Copco Reservoir (Table 4). Iron Gate Reservoir is 6.8 miles long, and Copco Reservoir is 4.5 miles long. Past toxin testing of water has shown that there is a variation of toxin levels within the reservoirs during bloom periods. Between five and seven fish were collected at each location in each reservoir. Liver composites from each of these six groups were also analyzed. The number of fish collected, and spatial distribution of sample collection, demonstrates the range of variability in tissue toxin levels.

Table 4 – Yellow Perch Summer 2007

Lab #	Date Collected	Location	Tissue Type	Total Microcystin (ng/g)
L-524-07-1	9/6-7/2007	Lower Iron Gate Reservoir	Fillet IG-1	Non-detectable
L-524-07-2	9/6-7/2007		Fillet IG-2	63.7
L-524-07-3	9/6-7/2007		Fillet IG-3	2.23
L-524-07-4	9/6-7/2007		Fillet IG-4	59.01
L-524-07-5	9/6-7/2007		Fillet IG-5	3.09
L-524-07-6	9/6-7/2007		Fillet IG-6	2.27
L-524-07-7	9/6-7/2007		Middle Iron Gate Reservoir	Fillet IG-7
L-524-07-7Dup	9/6-7/2007	Fillet IG-7 Dup		Non-detectable
L-524-07-8	9/6-7/2007	Fillet IG-8		3.01
L-524-07-9	9/6-7/2007	Fillet IG-9		2.02
L-524-07-10	9/6-7/2007	Fillet IG-10		2.68
L-524-07-11	9/6-7/2007	Fillet IG-11		2.18
L-524-07-12	9/6-7/2007	Fillet IG-12		Non-detectable
L-524-07-13	9/6-7/2007	Upper Iron Gate Reservoir	Fillet IG-13	Non-detectable
L-524-07-14	9/6-7/2007		Fillet IG-14	229.23
L-524-07-15	9/6-7/2007		Fillet IG-15	106
L-524-07-16	9/6-7/2007		Fillet IG-16	73
L-524-07-17	9/6-7/2007		Fillet IG-17	82.04
L-524-07-18	9/6-7/2007		Fillet IG-18	157.23
L-524-07-19	9/6-7/2007		Lower Copco Reservoir	Fillet CP-1
L-524-07-20	9/7-8/2007	Fillet CP-2		97.37
L-524-07-21	9/7-8/2007	Fillet CP-3		82.1
L-524-07-22	9/7-8/2007	Fillet CP-4		61.56
L-524-07-23	9/7-8/2007	Fillet CP-5		183.47
L-524-07-24	9/7-8/2007	Fillet CP-6		171
L-524-07-25	9/7-8/2007	Fillet CP-7		80.92
L-524-07-26	9/7-8/2007	Middle Copco Reservoir	Fillet CP-8	147
L-524-07-27	9/7-8/2007		Fillet CP-9	350
L-524-07-28	9/7-8/2007		Fillet CP-10	405
L-524-07-29	9/7-8/2007		Fillet CP-11	422
L-524-07-30	9/7-8/2007		Fillet CP-12	240
L-524-07-31	9/7-8/2007	Upper Copco Reservoir	Fillet CP-13	181
L-524-07-32	9/7-8/2007		Fillet CP-14	251
L-524-07-33	9/7-8/2007		Fillet CP-15	125
L-524-07-33Dup	9/7-8/2007		Fillet CP-16	141
L-524-07-34	9/7-8/2007		Fillet CP-17	101
L-524-07-35	9/7-8/2007		Fillet CP-18	Non-detectable
L-524-07-36	9/7-8/2007		Fillet CP-19	86.3
L-524-07-37	9/6-8/2007	Iron Gate Reservoir	IG Liver Composite	Non-detectable
L-524-07-38	9/6-8/2007		IG Liver Composite	50.1
L-524-07-39	9/6-8/2007		IG Liver Composite	70.6
L-524-07-40	9/6-8/2007	Copco Reservoir	CP Liver Composite	177.7
L-524-07-41	9/6-8/2007		CP Liver Composite	473.2
L-524-07-42	9/6-8/2007		CP Liver Composite	228.48

Fall and Spring Non-Bloom Period Samples

Mussels were collected at five locations from the I-5 Bridge downstream to Happy Camp in November 2007, well after the end of the bloom season (Table 5). Toxin levels at this time in 2007 were lower than in 2005 and 2006 (Kann 2007). The data indicates that depuration appears to occur in a fairly short period.

Table 5 – Mussels Winter 2007

Lab #	Date Collected	Species	Total Microcystin (ng/g)
L-665-07-1	11/5/2007	Gonidea angulata	Non-detectable
L-665-07-2	11/5/2007	Gonidea angulata	Non-detectable
L-665-07-3	11/5/2007	Gonidea angulata	Non-detectable
L-665-07-4	11/5/2007	Gonidea angulata	Non-detectable
L-665-07-5	11/5/2007	Gonidea angulata	Non-detectable
L-665-07-6	11/5/2007	Gonidea angulata	Non-detectable
L-665-07-7	11/5/2007	Gonidea angulata	Non-detectable
L-665-07-8	11/5/2007	Gonidea angulata	Non-detectable
L-665-07-9	11/5/2007	Gonidea angulata	Non-detectable
L-665-07-10	11/5/2007	Gonidea angulata	Non-detectable
L-665-07-11	11/5/2007	Gonidea angulata	Non-detectable
L-665-07-11Dup	11/5/2007	Gonidea angulata	Non-detectable
L-665-07-12	11/5/2007	Gonidea angulata	Non-detectable
L-665-07-13	11/5/2007	Margaratifera falcata	Non-detectable
L-665-07-14	11/6/2007	Gonidea angulata	Non-detectable
L-665-07-15	11/6/2007	Gonidea angulata	Non-detectable

Tim Wilhite with USEPA collected yellow perch during the spring of 2008 (Table 6) prior to the algae bloom when toxin levels were generally low. The objective of this sampling was to determine the level of depuration that occurred over the winter period.

Table 6 – Yellow Perch Spring 2008

Lab #	Date Collected	Location	Tissue Type	Total Microcystin (ng/g)
L-387-08-1	6/12/2008	Copco Reservoir Mallard Cove	Fillet	Non-detectable
L-387-08-2	6/12/2008		Fillet	Non-detectable
L-387-08-3	6/12/2008		Fillet	Non-detectable
L-387-08-4	6/12/2008		Fillet	Non-detectable
L-387-08-5	6/12/2008		Fillet	Non-detectable
L-387-08-5Dup	6/12/2008		Fillet	Non-detectable
L-387-08-6	6/12/2008		Fillet	Non-detectable
L-387-08-7	6/12/2008		Fillet	Non-detectable
L-387-08-8	6/12/2008		Fillet	Non-detectable
L-387-08-9	6/12/2008		Fillet	Non-detectable
L-387-08-10	6/12/2008	Copco Reservoir Copco Cove	Liver Composite	Non-detectable
L-387-08-11	6/12/2008		Fillet	Non-detectable
L-387-08-12	6/12/2008		Fillet	Non-detectable
L-387-08-13	6/12/2008		Fillet	Non-detectable
L-387-08-14	6/12/2008		Fillet	Non-detectable
L-387-08-15	6/12/2008		Fillet	Non-detectable
L-387-08-16	6/12/2008		Fillet	Non-detectable
L-387-08-17	6/12/2008		Fillet	Non-detectable
L-387-08-18	6/12/2008		Fillet	Non-detectable
			Liver Composite	Non-detectable

In 2007 the USEPA Region 9 laboratory analyzed microcystin in water samples using an enzyme-linked immunosorbent assay (ELISA) method for the Karuk Tribe. During the fall of 2007 toxin levels dropped more quickly than expected based on the *Microcystis aeruginosa* cell counts in the reservoirs. During the mid-September to October period this drop in toxin levels was more pronounced (Kann 2007). Duplicate samples were sent to the WPCL to confirm the ELISA method using the LC-ESI-MS/MS method. The ELISA method only reports total microcystin; it does not provide any analyte breakdown. The differentiation of analytes provided by the LC-ESI-MS/MS method and confirmation of toxin levels may help explain the cause of the conditions that occurred in 2007.

Table 7 – Water Samples

Lab #	Date Collected	Sample ID	Total Microcystin (ng/g)
L-722-07-1	7/23/2007	CRCC072307-SG	Non-detectable
L-722-07-2	7/24/2007	IR01072407-OO	Non-detectable
L-722-07-3	7/24/2007	CR01072407-OO	1,100.47
L-722-07-4	8/21/2007	CRCC082107-SG	21,223.1
L-722-07-5	8/22/2007	IR01082207-OO	41.33
L-722-07-6	8/23/2007	CR01082307-OO	43.451
L-722-07-6Dup	8/23/2007	CR01082307-OO	42.792
L-722-07-7	9/18/2007	KRBI091807-OC	Non-detectable
L-722-07-8	9/18/2007	IRJW091807-SG	Non-detectable
L-722-07-9	9/19/2007	CR01091907-OO	Non-detectable

### Conclusion

Microcystin levels in yellow perch from Copco Reservoir were higher than Iron Gate Reservoir. Copco Reservoir typically has higher toxin levels than Iron Gate Reservoir. In addition, while microcystin concentrations were variable, they appear to roughly correlate to toxin levels at those locations in the reservoir. For example yellow perch in the middle section of Copco Reservoir had a higher average concentration than fish in the upper and lower sections. Additional analysis and study could confirm this observed trend. Given a high likelihood that yellow perch sampled in the spring of 2008 were representative of the fish population sampled in 2007 the data indicate that depuration had occurred.

The highest microcystin concentration in tissues collected for this study was from mussels collected near the I-5 Bridge. Generally it appears the microcystin levels in mussels decreases downstream from Iron Gate Dam. As a result of the small sample size additional sampling is required to confirm this trend. As with yellow perch, it appears that depuration had occurred, but additional sampling of representative populations is required to confirm this result. As described above, freshwater mussels are sensitive to environmental degradation. This study was not designed to evaluate the impacts of microcystins on this species. Additional study is required to understand the impacts of cyanotoxins on freshwater mussels

Kann (2008) used results from this study to evaluate the risk to humans from consuming fish or shellfish from the Klamath River and concluded the level of microcystin warrants the development of advisories for tissue consumption. In a letter to PacifiCorp dated August 6, 2008, OEHHA staff stated that based on the data collected in 2007, they would have recommended against consuming shellfish from the effected sections of the Klamath River, and yellow perch from Iron Gate and Copco Reservoirs.



The data collected during this study has provided new and important information on the impact of cyanotoxins in the Klamath River. As with many studies, it also shows that more information will be needed to understand the full impact of microcystin accumulation in mussels and fish, and the impact to wildlife (river otters, raccoons, etc.) and humans from consuming these species. The original objectives of this study have been met and exceeded. Data has been generated that can be used in regulatory processes, and to inform and protect the public and tribal members about risks of consuming fish and shellfish from the Klamath River. Information generated by this study can be used by the State Water Board in consideration of water quality certification for the Klamath Hydroelectric Project and by the NCRWQB in the TMDL process. The information can also be used by Tribes to help inform Tribal members on public health issues, and by OEHHA staff for development of a risk assessment and fish tissue advisories.

### **Acknowledgements**

We want to thank Kari Norgaard, Susan Corum, and Tim Whilwhite who volunteered to collect field samples for this study. This support provided substantial cost savings that allowed for analysis of additional samples. We also want to thank Gail Louis at USEPA for support and advice on complex contract matters.

### **References:**

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VisitUSA. <http://www.visitusa.com/california/lakes/copcoandirongatereservoirs.htm>

**Appendicies:**

Laboratory Report L-405-07: 4 mussels

Laboratory Report L-475-07: 13 mussels composite

Laboratory Report L-463-07: 3 salmon composites (liver, stomach, fillet

Laboratory Report L-524-07: 36 yellow perch, 6 liver composites

Laboratory Report L-665-07: 15 mussels

Laboratory Report L-387-08: 16 yellow perch, 2 liver composites

Laboratory Report L-722-07: 9 water samples



**DEPARTMENT OF FISH AND GAME  
FISH AND WILDLIFE  
WATER POLLUTION CONTROL LABORATORY**

2005 NIMBUS ROAD  
RANCHO CORDOVA, CA 95670  
PHONE (916) 358-2858 ATSS 8-434-2858 FAX (916) 985-4301

WATER POLLUTION CONTROL BOARD  
2007 AUG 30 PM 12:00  
SACRAMENTO, CALIFORNIA  
STATE OF CALIFORNIA

**LABORATORY REPORT**

<b>Name:</b>	Russ J. Kanz	<b>Lab Number:</b>	L-405-07
<b>Agency:</b>	State Water Resource Control Board	<b>Other Number:</b>	
<b>Address:</b>	P. O. Box 2000	<b>Date Sampled:</b>	7/11, 20, 24/07
<b>City:</b>	Sacramento, CA 95812-2000	<b>Date Received:</b>	7/25/07
		<b>Date Completed:</b>	8/20/07
		<b>Index-PCA Code:</b>	

**RE:** Microcystin analysis in tissue


**RESULTS OF CHEMICAL ANALYSIS:**

Four tissue samples from the Klamath River were extracted and analyzed by LC/MS/MS for microcystins. See attached sheets for results.

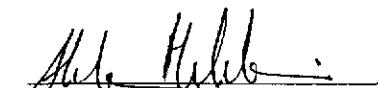
- NA Not Applicable
- ND Not Detected
- MDL Method Detection Limit
- RL Reporting Limit
- LCS Laboratory Control Spike
- LCSD Laboratory Control Spike Duplicate

Cost: To be invoiced per contract.

CC: Susan Corum  
P. O. Box 282  
Orleans, CA 95556

  
Project Chemist

Aug 27 '07  
Date

  
Lead Pesticide Chemist

8/27/07  
Date

  
Laboratory Director

8-27-07  
Date

SWRCB L-405-07

WPCL Lab#	Estimated MDL	Reporting Limit	L-405-07-1	L-405-07-2	L-405-07-2DUP	L-405-07-3A	L-405-07-3B
Sample Identification			<i>Gonedia angulata</i>	<i>G. angulata</i>	<i>G. angulata</i>	<i>G. angulata</i>	Different Species
Location			Klamath R. near IS 11/Jul/2007	Klamath River near Selad Valley 20/Jul/2007	Klamath River near Selad Valley 20/Jul/2007	Klamath River at Big Bar River access 24/Jul/2007	Klamath River at Big Bar River access 24/Jul/2007
Date Collected							
Time Collected			PM	PM	PM	AM	AM
Date Received			25/Jul/2007	25/Jul/2007	25/Jul/2007	25/Jul/2007	25/Jul/2007
Date Extracted			07/Aug/2007	07/Aug/2007	07/Aug/2007	07/Aug/2007	07/Aug/2007
Date Analyzed			08/Aug/2007	08/Aug/2007	08/Aug/2007	08/Aug/2007	08/Aug/2007
	Fresh Wt.	Fresh Wt.	Fresh Wt.	Fresh Wt.	Fresh Wt.	Fresh Wt.	Fresh Wt.
Microcystin Analytes	ppb (ng/g)	ppb (ng/g)	ppb (ng/g)	ppb (ng/g)	ppb (ng/g)	ppb (ng/g)	ppb (ng/g)
MCY-RR	0.500	1.00	136	5.09	6.17	ND	ND
MCY-Demethyl-RR*	0.500	1.00	ND	ND	ND	ND	ND
MCY-LR	0.500	1.00	396	90.9	91.4	68.4	58.1
MCY-Demethyl-LR*	0.500	1.00	36.6	5.55	5.78	6.05	5.10
MCY-YR	0.500	1.00	ND	ND	ND	ND	ND
MCY-LA	0.500	1.00	2,220	311	280	432	138
MCY-LW	0.500	1.00	ND	ND	ND	ND	ND
MCY-LF	0.500	1.00	14.5	ND	ND	ND	ND

\* Demethyl analog quantified as parent compound.

**SWRCB L-405-07**

WPCL Lab#	Estimated MDL	Reporting Limit	QA/QC Samples					
Sample Identification			L-405-07-Blank WPCL Oyster	Spike Level	L-405-07-LCS WPCL Oyster	L-405-07-LCS WPCL Oyster	L-405-07-LCSD WPCL Oyster	L-405-07-LCSD WPCL Oyster
Location								
Date Collected								
Time Collected								
Date Extracted			07/Aug/2007		07/Aug/2007	07/Aug/2007	07/Aug/2007	07/Aug/2007
Date Analyzed			08/Aug/2007		08/Aug/2007	08/Aug/2007	08/Aug/2007	08/Aug/2007
Microcystin Analytes	Fresh Wt. ppb (ng/g)	Fresh Wt. ppb (ng/g)	Fresh Wt. ppb (ng/g)	Expected value ppb (ng/g)	Amount Recovered ppb (ng/g)	% Recovery	Amount Recovered ppb (ng/g)	% Recovery
MCY-RR	0.500	1.00	ND	25.0	26.5	106	25.8	103
MCY-Demethyl-RR*	0.500	1.00	ND	NA	NA	NA	NA	NA
MCY-LR	0.500	1.00	ND	25.0	19.8	79.1	18.7	74.8
MCY-Demethyl-LP*	0.500	1.00	ND	NA	NA	NA	NA	NA
MCY-YR	0.500	1.00	ND	25.0	20.0	80.1	19.8	79.0
MCY-LA	0.500	1.00	ND	25.0	25.5	102	25.3	101
MCY-LW	0.500	1.00	ND	25.0	29.5	118	29.0	116
MCY-LF	0.500	1.00	ND	25.0	30.0	120	29.5	118

\* Demethyl analog quantified as parent compound.



DFG REQUEST FOR ANALYSIS AND CHAIN OF CUSTODY RECORD

Sampler: **KARI NORGARD** Ph #: **509 540 9351**  
 Address: **511 Bryant Ave**  
**Whittman College**  
 City: **Walla Walla WA** Zip: **99362**  
 Date Required/Reason: **When possible 2007**  
 Shipped Via: \_\_\_\_\_

Send Results To: **Russ J. Krenz** State Water Resource Control Board  
 Address: **PO Box 2000**  
 City: **Sacramento CA** Zip: **95812-2000**  
 Copies To: **Susan Corum**  
 Address: **PO Box 282**  
 City: **Orleans CA** Zip: **95556**

Lab Number: **L-405-07**  
 Field Number: \_\_\_\_\_  
 Lab Storage: **TSR1 Freezer**  
 Spill Title: \_\_\_\_\_  
 Suspect: \_\_\_\_\_  
 Index-PCA: \_\_\_\_\_

Fish & Wildlife Loss Date: \_\_\_\_\_ Region: \_\_\_\_\_  
 DFG Code Violation: \_\_\_\_\_  
 Suspected or Potential Problem: \_\_\_\_\_  
 Routine Analysis: \_\_\_\_\_

Sample Identification/Location (Draw map on separate sheet if necessary)	Analysis Requested >>>		Petroleum Fingerprint	Trace Elements (Specify Below)	Pesticides (Specify Below)	F or C	pH:	DO:	mg/L Conductivity:					u mhos/cm				
	Date	Time							Water	Filtered Water	Soil	Tissue	Plastic		Glass	VOA Vial	Preservation	
① <b>Gonedia angulata</b> <b>Kamath R.</b>	7-11-07	PM																
② <b>G. angulata</b> <b>Kamath R. near</b>	7-20-07	PM																
③ <b>G. angulata</b> <b>Big Bear</b>	7-24-07	AM																
④ <b>Dicotyl Species - Same location</b>	7-24-07	AM																

Problem Description: \_\_\_\_\_  
 Suspect/Incident Location: \_\_\_\_\_  
 Comments/Special Instructions: \_\_\_\_\_

Samples Relinquished By (Signature): **Kari Norgard** Print Name: **Kari Norgard** Date: **7-24-07**  
 Received By (Signature): **Marida Martin** Print Name: **Marida Martin** Date: **7-25-07**

Water Pollution Control Lab  
 2005 Nimbus Road  
 Rancho Cordova, CA 95670  
 (916) 358-2858

Petroleum Chemistry Lab  
 1995 Nimbus Road  
 Rancho Cordova, CA 95670  
 (916) 358-2803

Pesticide Investigations Lab  
 1701 Nimbus Road  
 Rancho Cordova, CA 95670  
 (916) 358-2950

RK



DEPARTMENT OF FISH AND GAME  
FISH AND WILDLIFE  
WATER POLLUTION CONTROL LABORATORY

2005 NIMBUS ROAD  
RANCHO CORDOVA, CA 95670  
PHONE (916) 358-2858 ATSS 8-434-2858 FAX (916) 985-4301

ALBANY REGIONAL  
COPCO RESERVOIR  
07/20/07 PM 12:00  
LABORATORY REPORT

LABORATORY REPORT

Name: Russ J. Kanz  
Agency: State Water Resource Control Board  
Address: P. O. Box 2000  
City: Sacramento, CA 95812-2000

Lab Number: L-475-07  
Other Number:  
Date Sampled: 7/20/07  
Date Received: 8/20/07  
Date Completed: 8/22/07  
Index-PCA Code:

RE: Microcystin analysis in mussels

RESULTS OF CHEMICAL ANALYSIS:

One mussel composite sample from the Copco Reservoir was extracted and analyzed by LC/MS/MS for microcystins. See attached sheets for results.

- NA Not Applicable
- ND Not Detected
- MDL Method Detection Limit
- RL Reporting Limit
- LCS Laboratory Control Spike
- LCSD Laboratory Control Spike Duplicate

Cost: To be invoiced per contract.

358-C317

Abdu Melib  
Lead Pesticide Chemist

08-27-07  
Date

DBA  
Laboratory Director 8-27-07  
Date

Mekebr

SWRCB L-475-07

WPCL Lab#	Estimated MDL	Reporting Limit	L-475-07-13 mussels	L-475-07-13DUP mussels	L-475-07-13TRIP mussels	L-405-07-Blank WPCL Oyster
Sample Identification						
Date Collected			20/Jul/2007	20/Jul/2007	20/Jul/2007	
Time Collected						
Date Received			20/Aug/2007	20/Aug/2007	20/Aug/2007	07/Aug/2007
Date Extracted			20/Aug/2007	20/Aug/2007	20/Aug/2007	08/Aug/2007
Date Analyzed			21/Aug/2007	21/Aug/2007	21/Aug/2007	
	Fresh Wt.	Fresh Wt.	Fresh Wt.	Fresh Wt.	Fresh Wt.	Fresh Wt.
Microcystin Analytes	ppb (ng/g)	ppb (ng/g)	ppb (ng/g)	ppb (ng/g)	ppb (ng/g)	ppb (ng/g)
MCY-RR	0.500	1.00	ND	ND	ND	ND
MCY-Demethyl-RR*	0.500	1.00	ND	ND	ND	ND
MCY-LR	0.500	1.00	ND	ND	ND	ND
MCY-Demethyl-LR*	0.500	1.00	ND	ND	ND	ND
MCY-YR	0.500	1.00	ND	ND	ND	ND
MCY-LA	0.500	1.00	57.0	32.3	34.2	ND
MCY-LW	0.500	1.00	ND	ND	ND	ND
MCY-LF	0.500	1.00	ND	ND	ND	ND
* Demethyl analog quantified as parent compound.						
QA/QC Samples						



**SWRCB L-475-07**

WPCL Lab#	Estimated MDL	Reporting Limit	Spike Level	L-405-07-LCS WPCL Oyster	L-405-07-LCS WPCL Oyster	L-405-07-LCSD WPCL Oyster	L-405-07-LCSD WPCL Oyster
Sample Identification							
Date Collected							
Time Collected							
Date Received							
Date Extracted				07/Aug/2007	07/Aug/2007	07/Aug/2007	07/Aug/2007
Date Analyzed				08/Aug/2007	08/Aug/2007	08/Aug/2007	08/Aug/2007
	Fresh Wt.	Fresh Wt.	Expected value	Amount Recovered	% Recovery	Amount Recovered	% Recovery
Microcystin Analytes	ppb (ng/g)	ppb (ng/g)	ppb (ng/g)	ppb (ng/g)		ppb (ng/g)	% Recovery
MCY-RR	0.500	1.00	25.0	26.5	106	25.8	103
MCY-Demethyl-RR*	0.500	1.00	NA	NA	NA	NA	NA
MCY-LR	0.500	1.00	25.0	19.8	79.1	18.7	74.8
MCY-Demethyl-LR*	0.500	1.00	NA	NA	NA	NA	NA
MCY-YR	0.500	1.00	25.0	20.0	80.1	19.8	79.0
MCY-LA	0.500	1.00	25.0	25.5	102	25.3	101
MCY-LW	0.500	1.00	25.0	29.5	118	29.0	116
MCY-LF	0.500	1.00	25.0	30.0	120	29.5	118
* Demethyl analog quantified as parent compound.							



DFG REQUEST FOR ANALYSIS AND CHAIN OF CUSTODY RECORD

Sampler <b>COPCO RESERVOIR</b>		Ph #		Send Results To <b>SWPCB</b>		Lab Number <b>L-475-07</b>	
Address		Address		Field Number			
City		City		Lab Storage			
Zip		Zip		Spill Title			
CA		CA		Suspect			
Date Required/Reason		Address		Suspect			
Shipped Via		City		Index-PCA			
Region:		Zip		mg/L Conductivity:		umhos/cm	
<input type="checkbox"/> Fish & Wildlife Loss Date:		F or C		pH:		DO:	
<input type="checkbox"/> DFG Code Violation:							
<input type="checkbox"/> Suspected or Potential Problem							
<input type="checkbox"/> Routine Analysis							
Sample Identification/Location (Draw map on separate sheet if necessary)		Analysis Requested >>>		Water Temp:		Sample Type	
<b>12 Yellow Perch</b>		Date		Time		Water	
						Filtered Water	
<b>13 MUSSELS</b>		Date		Time		Soil	
						Tissue	
Petroleum Fingerprint		Trace Elements (Specify Below)		Pesticides (Specify Below)		Plastic	
						Glass	
						VOA Vial	
						Temp	
						Acid	
Problem Description		Number of Containers		Preservation		Pollution Action Kit: Yes <input type="checkbox"/> No <input type="checkbox"/>	
Suspect/Incident Location		Glove Size: Large <input type="checkbox"/> Medium <input type="checkbox"/>		Hazard Slipper Requested: Yes <input type="checkbox"/> No <input type="checkbox"/>			
Comments/Special Instructions		Print Name		Date			
Samples Relinquished By (Signature)		Date		Received By (Signature)		Print Name	
				<i>Gregor Bartzell</i>		<b>GREGOR BARTZELL</b>	
						<b>8-20-07</b>	

Water Pollution Control Lab  
2005 Nimbus Road  
Rancho Cordova, CA 95670  
(916) 358-2858

Petroleum Chemistry Lab  
1995 Nimbus Road  
Rancho Cordova, CA 95670  
(916) 358-2803

Pesticide Investigations Lab  
1701 Nimbus Road  
Rancho Cordova, CA 95670  
(916) 358-2950

LAB COPIES: WHITE, CANARY, PINK

SUBMITTER: GOLDENROD

FG 1000 (Rev. 9/01)



**DEPARTMENT OF FISH AND GAME  
FISH AND WILDLIFE  
WATER POLLUTION CONTROL LABORATORY**

2005 NIMBUS ROAD  
RANCHO CORDOVA, CA 95670  
PHONE (916) 358-2858 ATSS 8-434-2858 FAX (916) 985-4301

STATE WATER RESOURCE CONTROL BOARD  
2007 AUG 30 PM 12:00  
STATE WATER RESOURCE CONTROL BOARD

**LABORATORY REPORT**

<b>Name:</b>	Russ J. Kanz	<b>Lab Number:</b>	L-463-07
<b>Agency:</b>	State Water Resource Control Board	<b>Other Number:</b>	
<b>Address:</b>	P. O. Box 2000	<b>Date Sampled:</b>	8/13/07
<b>City:</b>	Sacramento, CA 95812-2000	<b>Date Received:</b>	8/14/07
		<b>Date Completed:</b>	8/21/07
		<b>Index-PCA Code:</b>	

**RE:** Microcystin analysis in tissue

**RESULTS OF CHEMICAL ANALYSIS:**

Three fish sample composites (liver, stomach and fillet) from the Irongate Hatchery were extracted and analyzed by LC/MS/MS for microcystins. See attached sheets for results.

- NA Not Applicable
- ND Not Detected
- MDL Method Detection Limit
- RL Reporting Limit
- LCS Laboratory Control Spike
- LCSD Laboratory Control Spike Duplicate

Cost: To be invoiced per contract.

*Abdul Muhle*  
Lead Pesticide Chemist

8/27/07  
Date

*Bob Cannon*  
Laboratory Director

8-27-07  
Date

## SWRCB L-463-07

WPCL Lab#	Estimated MDL	Reporting Limit	L-463-07-1	L-463-07-2	L-463-07-3	L-405-07-Blank
Sample Identification			fish liver	fish stomach	fish fillet	WPCL Oyster
Date Collected			13/Aug/2007	13/Aug/2007	13/Aug/2007	
Time Collected						
Date Received			14/Aug/2007	14/Aug/2007	14/Aug/2007	07/Aug/2007
Date Extracted			16/Aug/2007	16/Aug/2007	16/Aug/2007	08/Aug/2007
Date Analyzed			17/Aug/2007	17/Aug/2007	17/Aug/2007	
<b>QA/QC Samples</b>						
	Fresh Wt.	Fresh Wt.	Fresh Wt.	Fresh Wt.	Fresh Wt.	Fresh Wt.
<b>Microcystin Analytes</b>	<b>ppb (ng/g)</b>	<b>ppb (ng/g)</b>	<b>ppb (ng/g)</b>	<b>ppb (ng/g)</b>	<b>ppb (ng/g)</b>	<b>ppb (ng/g)</b>
MCY-RR	0.500	1.00	ND	ND	ND	ND
MCY-Demethyl-RR*	0.500	1.00	ND	ND	ND	ND
MCY-LR	0.500	1.00	ND	ND	ND	ND
MCY-Demethyl-LR*	0.500	1.00	ND	ND	ND	ND
MCY-YR	0.500	1.00	ND	ND	ND	ND
MCY-LA	0.500	1.00	301	ND	ND	ND
MCY-LW	0.500	1.00	ND	ND	ND	ND
MCY-LF	0.500	1.00	ND	ND	ND	ND
* Demethyl analog quantified as parent compound.						

**SWRCB L-463-07**

WPCL Lab#	Estimated MDL	Reporting Limit	Spike Level	L-405-07-LCS WPCL Oyster	L-405-07-LCS WPCL Oyster	L-405-07-LCSD WPCL Oyster	L-405-07-LCSD WPCL Oyster
<b>Sample Identification</b>							
<b>Date Collected</b>							
<b>Time Collected</b>							
<b>Date Received</b>							
<b>Date Extracted</b>				07/Aug/2007	07/Aug/2007	07/Aug/2007	07/Aug/2007
<b>Date Analyzed</b>				08/Aug/2007	08/Aug/2007	08/Aug/2007	08/Aug/2007
<b>Microcystin Analytes</b>	<b>Fresh Wt. ppb (ng/g)</b>	<b>Fresh Wt. ppb (ng/g)</b>	<b>Expected value ppb (ng/g)</b>	<b>Recovered ppb (ng/g)</b>	<b>% Recovery</b>	<b>Recovered ppb (ng/g)</b>	<b>% Recovery</b>
MCY-RR	0.500	1.00	25.0	26.5	106	25.8	103
MCY-Demethyl-RR*	0.500	1.00	NA	NA	NA	NA	NA
MCY-LR	0.500	1.00	25.0	19.8	79.1	18.7	74.8
MCY-Demethyl-LR*	0.500	1.00	NA	NA	NA	NA	NA
MCY-YR	0.500	1.00	25.0	20.0	80.1	19.8	79.0
MCY-LA	0.500	1.00	25.0	25.5	102	25.3	101
MCY-LW	0.500	1.00	25.0	29.5	118	29.0	116
MCY-LF	0.500	1.00	25.0	30.0	120	29.5	118
* Demethyl analog quantified as parent compound.							



**DFG REQUEST FOR ANALYSIS AND CHAIN OF CUSTODY RECORD**

**Sampler** Iron Gate Hatchery  
**Address** 8638 Lakeview Rd  
**City** Horn Brook CA 96541  
**Date Required/Reason**

**Send Results To** Ross SWRCB  
**Address** Iron Gate Hatchery  
**City** CA  
**Lab Number** L463.07  
**Field Number**  
**Lab Storage** Feozer  
**Spill Title**  
**Suspect**

**Shipped Via** FedEx  
**Region:**  
**Water Temp:**  
**F or C**  
**pH:**  
**DO:** mg/L Conductivity: umhos/cm  
 Fish & Wildlife Loss Date: Region:  
 DFG Code Violation:  
 Suspected or Potential Problem  
 Routine Analysis

**Analysis Requested >>>**  
**Sample Identification/Location** (Draw map on separate sheet if necessary)  
 L-3 → 6 fish composite for microcystin 9/13/07  
 L-9 → 6 fish to be analyzed individually  
 L-463-07-1 liver  
 2 stomach  
 3 tissue

Problem Description	Petroleum Fingerprint			pH	DO	mg/L Conductivity	umhos/cm
	Trace Elements (Specify Below)	Pesticides (Specify Below)	Water				
Suspect/Incident Location							
Comments/Special Instructions							
Pollution Action Kit: Yes <input type="checkbox"/> No <input type="checkbox"/>							
Glove Size: Large <input type="checkbox"/> Medium <input type="checkbox"/>							
Hazard Shipper Requested: Yes <input type="checkbox"/> No <input type="checkbox"/>							

**Sample Retiquished By (Signature)** Huda Holek  
**Print Name** Huda Holek  
**Date** 9/14/07

**Received By (Signature)** Huda Holek  
**Print Name** Huda Holek  
**Date** 9/14/07

Water Pollution Control Lab  
 2005 Nimbus Road  
 Rancho Cordova, CA 95670  
 (916) 358-2858

Petroleum Chemistry Lab  
 1995 Nimbus Road  
 Rancho Cordova, CA 95670  
 (916) 358-2803

Pesticide Investigations Lab  
 1701 Nimbus Road  
 Rancho Cordova, CA 95670  
 (916) 358-2950



RK

**DEPARTMENT OF FISH AND GAME  
FISH AND WILDLIFE  
WATER POLLUTION CONTROL LABORATORY**

2005 NIMBUS ROAD  
RANCHO CORDOVA, CA 95670  
PHONE (916) 358-2858 ATSS 8-434-2858 FAX (916) 985-4301

**LABORATORY REPORT**

<b>Name:</b>	Russ J. Kanz	<b>Lab Number:</b>	L-524-07
<b>Agency:</b>	State Water Resource Control Board	<b>Other Number:</b>	
<b>Address:</b>	P. O. Box 2000	<b>Date Sampled:</b>	09/06-07/07
<b>City:</b>	Sacramento, CA 95812-2000	<b>Date Received:</b>	09/11/07
		<b>Date Completed:</b>	11/14/07
		<b>Index-PCA Code:</b>	

**RE:** Microcystin analysis

**RESULTS OF CHEMICAL ANALYSIS:**

Forty-two tissue samples from the Copco and Irongate Reservoirs was extracted and analyzed by LC/MS/MS for microcystins. See attached sheets for results.

NA	Not Applicable
ND	Not Detected
MDL	Method Detection Limit
RL	Reporting Limit
MBik	Method Blank
LCS	Laboratory Control Spike
LCSD	Laboratory Control Spike Duplicate
MS	Matrix Spike
MSD	Matrix Spike Duplicate

Original  
 09/11/07 12:00 PM  
 11/15/07 11:48 AM

Cost: To be invoiced per contract.

*[Signature]*  
Project Chemist

Nov-15-07  
Date

*[Signature]* 11.15.07  
Lead Pesticide Chemist Date

*[Signature]*  
Laboratory Director

11-15-07  
Date

Klamath  
L-524-07

WPCL Lab#	Estimated MDL	Reporting Limit	L-524-07-1	L-524-07-2	L-524-07-3	L-524-07-4	L-524-07-5
<b>Sample Identification</b>			IG-1	IG-2	IG-3	IG-4	IG-5
<b>Date Collected</b>			09/06-07/07	09/06-07/07	09/06-07/07	09/06-07/07	09/06-07/07
<b>Time Collected</b>			all day	all day	all day	all day	all day
<b>Date Received</b>			11/Sep/2007	11/Sep/2007	11/Sep/2007	11/Sep/2007	11/Sep/2007
<b>Date Extracted</b>			08/Oct/2007	08/Oct/2007	08/Oct/2007	08/Oct/2007	08/Oct/2007
<b>Date Analyzed</b>			09/Oct/2007	09/Oct/2007	09/Oct/2007	09/Oct/2007	09/Oct/2007
<b>Matrix</b>			Tissue	Tissue	Tissue	Tissue	Tissue
<b>Microcystin Analytes</b>	<b>ppb</b>	<b>ppb</b>	<b>Fresh Wt. ppb (ng/g)</b>	<b>Fresh Wt. ppb (ng/g)</b>	<b>Fresh Wt. ppb (ng/g)</b>	<b>Fresh Wt. ppb (ng/g)</b>	<b>Fresh Wt. ppb (ng/g)</b>
MCY-RR	2.00	5.00	ND	ND	ND	ND	ND
MCY-Demethyl-RR*	2.00	5.00	ND	ND	ND	ND	ND
MCY-LR	2.00	5.00	ND	ND	ND	ND	ND
MCY-Demethyl-LR*	2.00	5.00	ND	63.7	ND	57.0	ND
MCY-YR	2.00	5.00	ND	ND	2.23	2.01	3.09
MCY-LA	2.00	5.00	ND	ND	ND	ND	ND
MCY-LW	2.00	5.00	ND	ND	ND	ND	ND
MCY-LF	2.00	5.00	ND	ND	ND	ND	ND
* Demethyl analog quantified as parent compound.							



Klamath  
L-524-07

WPCL Lab#	Estimated MDL	Reporting Limit	L-524-07-6	L-524-07-7	L-524-07-7Dup	L-524-07-8	L-524-07-9
<b>Sample Identification</b>			IG-6	IG-7	IG-7	IG-8	IG-9
<b>Date Collected</b>			09/06-07/07	09/06-07/07	09/06-07/07	09/06-07/07	09/06-07/07
<b>Time Collected</b>			all day	all day	all day	all day	all day
<b>Date Received</b>			11/Sep/2007	11/Sep/2007	11/Sep/2007	11/Sep/2007	11/Sep/2007
<b>Date Extracted</b>			08/Oct/2007	08/Oct/2007	08/Oct/2007	08/Oct/2007	08/Oct/2007
<b>Date Analyzed</b>			09/Oct/2007	09/Oct/2007	09/Oct/2007	09/Oct/2007	09/Oct/2007
<b>Matrix</b>			Tissue	Tissue	Tissue	Tissue	Tissue
<b>Microcystin Analytes</b>	<b>ppb</b>	<b>ppb</b>	<b>Fresh Wt. ppb (ng/g)</b>	<b>Fresh Wt. ppb (ng/g)</b>	<b>Fresh Wt. ppb (ng/g)</b>	<b>Fresh Wt. ppb (ng/g)</b>	<b>Fresh Wt. ppb (ng/g)</b>
MCY-RR	2.00	5.00	ND	ND	ND	ND	ND
MCY-Demethyl-RR*	2.00	5.00	ND	ND	ND	ND	ND
MCY-LR	2.00	5.00	ND	ND	ND	ND	ND
MCY-Demethyl-LR*	2.00	5.00	ND	ND	ND	ND	ND
MCY-YR	2.00	5.00	2.27	2.54	ND	3.01	2.02
MCY-LA	2.00	5.00	ND	ND	ND	ND	ND
MCY-LW	2.00	5.00	ND	ND	ND	ND	ND
MCY-LF	2.00	5.00	ND	ND	ND	ND	ND
* Demethyl analog quantified as parent compound.							

Klamath  
L-524-07

WPCL Lab#	Estimated MDL	Reporting Limit	L-524-07-10	L-524-07-11	L-524-07-12	L-524-07-13	L-524-07-14
<b>Sample Identification</b>			IG-10	IG-11	IG-12	IG-13	IG-14
<b>Date Collected</b>			09/06-07/07	09/06-07/07	09/06-07/07	09/06-07/07	09/06-07/07
<b>Time Collected</b>			all day	all day	all day	all day	all day
<b>Date Received</b>			11/Sep/2007	11/Sep/2007	11/Sep/2007	11/Sep/2007	11/Sep/2007
<b>Date Extracted</b>			08/Oct/2007	08/Oct/2007	08/Oct/2007	08/Oct/2007	08/Oct/2007
<b>Date Analyzed</b>			09/Oct/2007	09/Oct/2007	09/Oct/2007	09/Oct/2007	09/Oct/2007
<b>Matrix</b>			Tissue	Tissue	Tissue	Tissue	Tissue
<b>Microcystin Analytes</b>	<b>ppb</b>	<b>ppb</b>	<b>Fresh Wt. ppb (ng/g)</b>	<b>Fresh Wt. ppb (ng/g)</b>	<b>Fresh Wt. ppb (ng/g)</b>	<b>Fresh Wt. ppb (ng/g)</b>	<b>Fresh Wt. ppb (ng/g)</b>
MCY-RR	2.00	5.00	ND	ND	ND	ND	ND
MCY-Demethyl-RR*	2.00	5.00	ND	ND	ND	ND	ND
MCY-LR	2.00	5.00	ND	ND	ND	ND	ND
MCY-Demethyl-LR*	2.00	5.00	ND	ND	ND	ND	227
MCY-YR	2.00	5.00	2.68	2.18	ND	ND	2.23
MCY-LA	2.00	5.00	ND	ND	ND	ND	ND
MCY-LW	2.00	5.00	ND	ND	ND	ND	ND
MCY-LF	2.00	5.00	ND	ND	ND	ND	ND
* Demethyl analog quantified as parent compound.							

Klamath  
L-524-07

WPCL Lab#	Estimated MDL	Reporting Limit	L-524-07-15	L-524-07-16	L-524-07-17	L-524-07-18	L-524-07-19
<b>Sample Identification</b>			IG-15	IG-16	IG-17	IG-18	CP-1
<b>Date Collected</b>			09/06-07/07 all day	09/06-07/07 all day	09/06-07/07 all day	09/06-07/07 all day	09/07-08/07 all day
<b>Time Collected</b>							
<b>Date Received</b>			11/Sep/2007	11/Sep/2007	11/Sep/2007	11/Sep/2007	11/Sep/2007
<b>Date Extracted</b>			08/Oct/2007	08/Oct/2007	08/Oct/2007	08/Oct/2007	09/Oct/2007
<b>Date Analyzed</b>			09/Oct/2007	09/Oct/2007	09/Oct/2007	09/Oct/2007	09/Oct/2007
<b>Matrix</b>			Tissue	Tissue	Tissue	Tissue	Tissue
<b>Microcystin Analytes</b>	<b>ppb</b>	<b>ppb</b>	<b>Fresh Wt. ppb (ng/g)</b>	<b>Fresh Wt. ppb (ng/g)</b>	<b>Fresh Wt. ppb (ng/g)</b>	<b>Fresh Wt. ppb (ng/g)</b>	<b>Fresh Wt. ppb (ng/g)</b>
MCY-RR	2.00	5.00	ND	ND	ND	ND	ND
MCY-Demethyl-RR*	2.00	5.00	ND	ND	ND	ND	ND
MCY-LR	2.00	5.00	ND	ND	ND	ND	ND
MCY-Demethyl-LR*	2.00	5.00	106	73.0	79.8	153	77.7
MCY-YR	2.00	5.00	ND	ND	2.24	4.23	ND
MCY-LA	2.00	5.00	ND	ND	ND	ND	ND
MCY-LW	2.00	5.00	ND	ND	ND	ND	ND
MCY-LF	2.00	5.00	ND	ND	ND	ND	ND
* Demethyl analog quantified as parent compound.							

Klamath  
L-524-07

WPCL Lab#	Estimated MDL	Reporting Limit	L-524-07-20	L-524-07-21	L-524-07-22	L-524-07-23	L-524-07-24
<b>Sample Identification</b>			CP-2	CP-3	CP-4	CP-5	CP-6
<b>Date Collected</b>			09/07-08/07	09/07-08/07	09/07-08/07	09/07-08/07	09/07-08/07
<b>Time Collected</b>			all day	all day	all day	all day	all day
<b>Date Received</b>			11/Sep/2007	11/Sep/2007	11/Sep/2007	11/Sep/2007	11/Sep/2007
<b>Date Extracted</b>			09/Oct/2007	09/Oct/2007	09/Oct/2007	09/Oct/2007	09/Oct/2007
<b>Date Analyzed</b>			09/Oct/2007	09/Oct/2007	09/Oct/2007	09/Oct/2007	09/Oct/2007
<b>Matrix</b>			Tissue	Tissue	Tissue	Tissue	Tissue
<b>Microcystin Analytes</b>	<b>ppb</b>	<b>ppb</b>	<b>Fresh Wt. ppb (ng/g)</b>	<b>Fresh Wt. ppb (ng/g)</b>	<b>Fresh Wt. ppb (ng/g)</b>	<b>Fresh Wt. ppb (ng/g)</b>	<b>Fresh Wt. ppb (ng/g)</b>
MCY-RR	2.00	5.00	ND	ND	ND	ND	ND
MCY-Demethyl-RR*	2.00	5.00	ND	ND	ND	ND	ND
MCY-LR	2.00	5.00	ND	ND	ND	ND	ND
MCY-Demethyl-LR*	2.00	5.00	95.2	82.1	58.4	181	171
MCY-YR	2.00	5.00	2.17	ND	3.16	2.47	ND
MCY-LA	2.00	5.00	ND	ND	ND	ND	ND
MCY-LW	2.00	5.00	ND	ND	ND	ND	ND
MCY-LF	2.00	5.00	ND	ND	ND	ND	ND
* Demethyl analog quantified as parent compound.							

Klamath  
L-524-07

WPCL Lab#	Estimated MDL	Reporting Limit	L-524-07-25	L-524-07-26	L-524-07-27	L-524-07-28	L-524-07-29
<b>Sample Identification</b>			CP-7	CP-8	CP-9	CP-10	CP-11
<b>Date Collected</b>			09/07-08/07 all day	09/07-08/07 all day	09/07-08/07 all day	09/07-08/07 all day	09/07-08/07 all day
<b>Date Received</b>			11/Sep/2007	11/Sep/2007	11/Sep/2007	11/Sep/2007	11/Sep/2007
<b>Date Analyzed</b>			09/Oct/2007	09/Oct/2007	09/Oct/2007	09/Oct/2007	09/Oct/2007
<b>Matrix</b>			Tissue	Tissue	Tissue	Tissue	Tissue
<b>Microcystin Analytes</b>	ppb	ppb	Fresh Wt. ppb (ng/g)	Fresh Wt. ppb (ng/g)	Fresh Wt. ppb (ng/g)	Fresh Wt. ppb (ng/g)	Fresh Wt. ppb (ng/g)
MCY-RR	2.00	5.00	ND	ND	ND	ND	ND
MCY-Demethyl-RR*	2.00	5.00	ND	ND	ND	ND	ND
MCY-LR	2.00	5.00	ND	ND	ND	ND	ND
MCY-Demethyl-LR*	2.00	5.00	78.8	147	350	405	422
MCY-YR	2.00	5.00	2.12	ND	ND	ND	ND
MCY-LA	2.00	5.00	ND	ND	ND	ND	ND
MCY-LW	2.00	5.00	ND	ND	ND	ND	ND
MCY-LF	2.00	5.00	ND	ND	ND	ND	ND
* Demethyl analog quantified as parent compound.							

Klamath  
L-524-07

WPCL Lab#	Estimated MDL	Reporting Limit	L-524-07-30	L-524-07-31	L-524-07-32	L-524-07-33	L-524-07-33Dup
<b>Sample Identification</b>			CP-12	CP-13	CP-14	CP-15	CP-16
<b>Date Collected</b>			09/07-08/07	09/07-08/07	09/07-08/07	09/07-08/07	09/07-08/07
<b>Time Collected</b>			all day	all day	all day	all day	all day
<b>Date Received</b>			11/Sep/2007	11/Sep/2007	11/Sep/2007	11/Sep/2007	11/Sep/2007
<b>Date Extracted</b>			09/Oct/2007	09/Oct/2007	09/Oct/2007	09/Oct/2007	09/Oct/2007
<b>Date Analyzed</b>			09/Oct/2007	09/Oct/2007	09/Oct/2007	09/Oct/2007	09/Oct/2007
<b>Matrix</b>			Tissue	Tissue	Tissue	Tissue	Tissue
<b>Microcystin Analytes</b>	ppb	ppb	Fresh Wt. ppb (ng/g)	Fresh Wt. ppb (ng/g)	Fresh Wt. ppb (ng/g)	Fresh Wt. ppb (ng/g)	Fresh Wt. ppb (ng/g)
MCY-RR	2.00	5.00	ND	ND	ND	ND	ND
MCY-Demethyl-RR*	2.00	5.00	ND	ND	ND	ND	ND
MCY-LR	2.00	5.00	ND	ND	ND	ND	ND
MCY-Demethyl-LR*	2.00	5.00	240	181	251	125	141
MCY-YR	2.00	5.00	ND	ND	ND	ND	ND
MCY-LA	2.00	5.00	ND	ND	ND	ND	ND
MCY-LW	2.00	5.00	ND	ND	ND	ND	ND
MCY-LF	2.00	5.00	ND	ND	ND	ND	ND
* Demethyl analog quantified as parent compound.							

Klamath  
L-524-07

WPCL Lab#	Estimated MDL	Reporting Limit	L-524-07-34	L-524-07-35	L-524-07-36	L-524-07-37	L-524-07-38
<b>Sample Identification</b>			CP-17	CP-18	CP-19	IG-37	IG-38
<b>Date Collected</b>			09/07-08/07 all day	09/07-08/07 all day	09/07-08/07 all day	09/06-08/07 all day	09/06-08/07 all day
<b>Time Collected</b>							
<b>Date Received</b>			11/Sep/2007	11/Sep/2007	11/Sep/2007	11/Sep/2007	11/Sep/2007
<b>Date Extracted</b>			09/Oct/2007	09/Oct/2007	09/Oct/2007	09/Oct/2007	09/Oct/2007
<b>Date Analyzed</b>			09/Oct/2007	09/Oct/2007	09/Oct/2007	09/Oct/2007	09/Oct/2007
<b>Matrix</b>			Tissue	Tissue	Tissue	Liver	Liver
<b>Microcystin Analytes</b>	<b>ppb</b>	<b>ppb</b>	<b>Fresh Wt. ppb (ng/g)</b>	<b>Fresh Wt. ppb (ng/g)</b>	<b>Fresh Wt. ppb (ng/g)</b>	<b>Fresh Wt. ppb (ng/g)</b>	<b>Fresh Wt. ppb (ng/g)</b>
MCY-RR	2.00	5.00	ND	ND	ND	ND	ND
MCY-Demethyl-RR*	2.00	5.00	ND	ND	ND	ND	37.4
MCY-LR	2.00	5.00	ND	ND	ND	ND	ND
MCY-Demethyl-LR*	2.00	5.00	101	ND	86.3	ND	ND
MCY-YR	2.00	5.00	ND	ND	ND	ND	ND
MCY-LA	2.00	5.00	ND	ND	ND	ND	12.7
MCY-LW	2.00	5.00	ND	ND	ND	ND	ND
MCY-LF	2.00	5.00	ND	ND	ND	ND	ND
* Demethyl analog quantified as parent compound.							

Klamath  
L-524-07

WPCL Lab#	Estimated MDL	Reporting Limit	L-524-07-39	L-524-07-40	L-524-07-41	L-524-07-42
<b>Sample Identification</b>			<b>IG-39</b>	<b>CP-40</b>	<b>CP-41</b>	<b>CP-42</b>
<b>Date Collected</b>			09/06-08/07	09/06-08/07	09/06-08/07	09/06-08/07
<b>Time Collected</b>			all day	all day	all day	all day
<b>Date Received</b>			11/Sep/2007	11/Sep/2007	11/Sep/2007	11/Sep/2007
<b>Date Extracted</b>			09/Oct/2007	09/Oct/2007	09/Oct/2007	09/Oct/2007
<b>Date Analyzed</b>			09/Oct/2007	09/Oct/2007	09/Oct/2007	09/Oct/2007
<b>Matrix</b>			Liver	Liver	Liver	Liver
<b>Microcystin Analytes</b>	<b>ppb</b>	<b>ppb</b>	<b>Fresh Wt. ppb (ng/g)</b>	<b>Fresh Wt. ppb (ng/g)</b>	<b>Fresh Wt. ppb (ng/g)</b>	<b>Fresh Wt. ppb (ng/g)</b>
MCY-RR	2.00	5.00	15.7	ND	ND	ND
MCY-Demethyl-RR*	2.00	5.00	42.2	25.0	33.5	61.6
MCY-LR	2.00	5.00	ND	ND	ND	ND
MCY-Demethyl-LR*	2.00	5.00	ND	138	426	159
MCY-YR	2.00	5.00	ND	ND	ND	ND
MCY-LA	2.00	5.00	12.7	14.7	13.7	7.88
MCY-LW	2.00	5.00	ND	ND	ND	ND
MCY-LF	2.00	5.00	ND	ND	ND	ND
* Demethyl analog quantified as parent compound.						
<b>QA/QC Samples</b>						



Klamath  
L-524-07

WPCL Lab#	Estimated MDL	Reporting Limit	L-524-07-MBlank	L-524-07-LCS	L-524-07-3MS	L-524-07-3MSD
<b>Sample Identification</b>			<b>Solvent Blank</b>	<b>American River Trout</b>	<b>IG-3</b>	<b>IG-3</b>
<b>Date Collected</b>					09/06-07/07	09/06-07/07
<b>Time Collected</b>					all day	all day
<b>Date Received</b>					11/Sep/2007	11/Sep/2007
<b>Date Extracted</b>			09/09/07	09/08/07	09/08/07	09/08/07
<b>Date Analyzed</b>			09/09/07	09/09/07	09/09/07	09/09/07
<b>Matrix</b>				<b>Tissue</b>	<b>Tissue</b>	<b>Tissue</b>
<b>Microcystin Analytes</b>	<b>ppb</b>	<b>ppb</b>	<b>ppb (ug/L)</b>	<b>Fresh Wt. Recovery (%)</b>	<b>Fresh Wt. Recovery (%)</b>	<b>Fresh Wt. Recovery (%)</b>
MCY-RR	2.00	5.00	ND	105	112	115
MCY-Demethyl-RR*	2.00	5.00	ND	NA	NA	NA
MCY-LR	2.00	5.00	ND	107	82.9	77.5
MCY-Demethyl-LR*	2.00	5.00	ND	NA	NA	NA
MCY-YR	2.00	5.00	ND	115	72.0	87.3
MCY-LA	2.00	5.00	ND	103	73.5	72.9
MCY-LW	2.00	5.00	ND	101	75.4	74.3
MCY-LF	2.00	5.00	ND	103	82.8	80.7
* Demethyl analog quantified as parent compound.						

Klamath  
L-524-07

WPCL Lab#	Estimated MDL	Reporting Limit	L-524-07-26MS	L-524-07-26MSD
<b>Sample Identification</b>			CP-8	CP-8
<b>Date Collected</b>			09/07-08/07	09/07-08/07
<b>Time Collected</b>			all day	all day
<b>Date Received</b>			11/Sep/2007	11/Sep/2007
<b>Date Analyzed</b>			09/09/07	09/09/07
<b>Matrix</b>			Tissue	Tissue
<b>Microcystin Analytes</b>	<b>ppb</b>	<b>ppb</b>	<b>Fresh Wt. Recovery (%)</b>	<b>Fresh Wt. Recovery (%)</b>
MCY-RR	2.00	5.00	125	118
MCY-Demethyl-RR*	2.00	5.00	NA	NA
MCY-LR	2.00	5.00	81.8	114
MCY-Demethyl-LR*	2.00	5.00	NA	NA
MCY-YR	2.00	5.00	97.9	116
MCY-LA	2.00	5.00	73.6	80.3
MCY-LW	2.00	5.00	83.8	92.0
MCY-LF	2.00	5.00	89.1	96.1
* Demethyl analog quantified as parent compound.				



DFG REQUEST FOR ANALYSIS AND CHAIN OF CUSTODY RECORD

Sampler <i>Kevin Atwood</i>		Ph #		Lab Number <i>1-524-07</i>	
Address		Send Results To		Field Number	
City		City		Lab Storage <i>TRM F 20</i>	
State CA		State CA		Spill Title	
Date Required/Reason		Address		Suspect	
Shipped Via		City		Index-PCA	
<input type="checkbox"/> Fish & Wildlife Loss Date:      Region:		Water Temp:		F or C	
<input type="checkbox"/> DFG Code Violation:		Trace Elements (Specify Below)		pH:	
<input type="checkbox"/> Suspected or Potential Problem		Pesticides (Specify Below)		DO:	
<input type="checkbox"/> Routine Analysis		Analysis Requested >>> Collection Date      Time		mg/L Conductivity:	
Sample Identification/Location (Draw map on separate sheet if necessary)		Petroleum Fingerprint		m/L Conductivity:	
<i>Copper Res 15 VP</i>  <i>Iron Gate Res 18 VP</i>		Water      Filtered Water Soil      Tissue <i>Fish</i> Plastic      Glass VOA Vial      Temp      Acid		Number of Containers      Preservation	
Problem Description <i>Final conceptual</i> <i>Final P.I. directives</i> <i>Final attached</i> <i>Final contract</i>		Pollution Action Kit: Yes <input type="checkbox"/> No <input type="checkbox"/> Glove Size: Large <input type="checkbox"/> Medium <input type="checkbox"/> Hazmat Shipper Requested: Yes <input type="checkbox"/> No <input type="checkbox"/>			
Suspect/Incident Location		Print Name		Date	
Comments/Special Instructions		Received By (Signature)		Print Name	
Samples Relinquished By (Signature)		<i>[Signature]</i>		<i>LAURIE SMITH</i>	
				Date	
				<i>9/17/07</i>	

LAB COPIES: WHITE, CANARY, PINK      SUBMITTER: GOLDENROD      FG 1000 (Rev. 9/01)

Water Pollution Control Lab  
2005 Nimbus Road  
Rancho Cordova, CA 95670  
(916) 358-2858

Petroleum Chemistry Lab  
1995 Nimbus Road  
Rancho Cordova, CA 95670  
(916) 358-2803

Pesticide Investigations Lab  
1701 Nimbus Road  
Rancho Cordova, CA 95670  
(916) 358-2950

L-524-07

TISSUE SAMPLING FIELD SHEET

Sheet 1 of 1

Project: Klamath Algal Toxins

Lab Code: \_\_\_\_\_

Date: 9/07/07

Statnum: \_\_\_\_\_

Time: all day

Statname: Copco Res.

Station Description: 3 sites: upper, middle, lower lake

Directions to Station: \_\_\_\_\_

County: \_\_\_\_\_ USGS Map: \_\_\_\_\_

Lower  
Middle  
Upper

Lat: 41.96884 Lon: 122.37634 Projection: NAD 83

use photos  
41.97255 122.27907 - not the site of fish, but marker

Method	Effort	Species	Number	Size	Package #	Notes
<u>Fishing</u>	<u>12 hrs</u>	<u>Yardh</u>	<u>18+</u>		<u>18</u>	<u>grouped by site</u>

Species Length/Weight

Species: <u>Yardh</u>				Species:				Species:			
Total Number:				Total Number:				Total Number:			
ID #	FL	TL	WT	ID #	FL	TL	WT	ID #	FL	TL	WT
<u>CP1</u>	<u>231</u>	<u>241</u>	<u>174</u>	<u>CP13</u>	<u>200</u>	<u>210</u>	<u>107</u>				
<u>CP2</u>	<u>221</u>	<u>232</u>	<u>150</u>	<u>CP14</u>	<u>192</u>	<u>200</u>	<u>83</u>				
<u>CP3</u>	<u>230</u>	<u>239</u>	<u>151</u>	<u>CP15</u>	<u>231</u>	<u>241</u>	<u>149</u>				
<u>CP4</u>	<u>213</u>	<u>225</u>	<u>136</u>	<u>CP16</u>	<u>227</u>	<u>239</u>	<u>140</u>				
<u>CP5</u>	<u>206</u>	<u>217</u>	<u>114</u>	<u>CP17</u>	<u>202</u>	<u>211</u>	<u>100</u>				
<u>CP6</u>	<u>211</u>	<u>221</u>	<u>122</u>	<u>CP18</u>	<u>179</u>	<u>188</u>	<u>72</u>				
<u>CP7</u>	<u>215</u>	<u>224</u>	<u>119</u>								
<u>CP8</u>	<u>253</u>	<u>264</u>	<u>221</u>								
<u>CP9</u>	<u>225</u>	<u>235</u>	<u>145</u>								
<u>CP10</u>	<u>202</u>	<u>211</u>	<u>98</u>								
<u>CP11</u>	<u>208</u>	<u>217</u>	<u>121</u>								
<u>CP12</u>	<u>204</u>	<u>214</u>	<u>114</u>								

Additional Species: Crappie

Comments: windy

Organics \_\_\_\_\_ Metals \_\_\_\_\_ Archive \_\_\_\_\_ Other \_\_\_\_\_

TISSUE SAMPLING FIELD SHEET

Sheet 1 of 1

Project: Klanath Algal Toxins Lab Code: \_\_\_\_\_

Date: 9/6-7/07 Statnum: \_\_\_\_\_

Time: all day Statname: Troagato Res.

Station Description: 3 sites: upper, middle, lower lake

Directions to Station: \_\_\_\_\_

County: \_\_\_\_\_ USGS Map: \_\_\_\_\_

lower  
middle  
upper

Lat: 41.94408 Lon: 122.43002 Projection: NAD 83  
41.97065 122.41750  
41.96880 122.37637

Method	Effort	Species	Number	Size	Package #	Notes
<u>Fishing</u>	<u>20 minutes</u>	<u>Yw Pch</u>	<u>18</u>		<u>18</u>	<u>grouped by site</u>

Species Length/Weight

Lower 3  
MSL M 4-6  
Dup 7  
Middle 8-10  
11  
12

Species: <u>Yw Pch</u>				Species: <u>Yw Pch</u>				Species: _____			
Total Number: <u>12</u>				Total Number: <u>6</u>				Total Number: _____			
ID #	FL	TL	WT	ID #	FL	TL	WT	ID #	FL	TL	WT
<u>1</u>	<u>IG1</u>	<u>245</u>	<u>253</u>	<u>185</u>	<u>IG13</u>	<u>207</u>	<u>216</u>	<u>111</u>			
<u>2</u>	<u>IG2</u>	<u>221</u>	<u>231</u>	<u>171</u>	<u>IG14</u>	<u>194</u>	<u>205</u>	<u>102</u>			
<u>3</u>	<u>IG3</u>	<u>241</u>	<u>254</u>	<u>191</u>	<u>IG15</u>	<u>192</u>	<u>201</u>	<u>95</u>	<u>Upper</u>		
<u>4</u>	<u>IG4</u>	<u>227</u>	<u>231</u>	<u>167</u>	<u>IG16</u>	<u>187</u>	<u>197</u>	<u>83</u>			
<u>5</u>	<u>IG5</u>	<u>242</u>	<u>253</u>	<u>222</u>	<u>IG17</u>	<u>179</u>	<u>189</u>	<u>75</u>			
<u>6</u>	<u>IG6</u>	<u>207</u>	<u>212</u>	<u>116</u>	<u>IG18</u>	<u>183</u>	<u>191</u>	<u>82</u>			
<u>7</u>	<u>IG7</u>	<u>246</u>	<u>259</u>	<u>195</u>							
<u>8</u>	<u>IG8</u>	<u>222</u>	<u>231</u>	<u>159</u>							
<u>9</u>	<u>IG9</u>	<u>223</u>	<u>237</u>	<u>146</u>							
<u>10</u>	<u>IG10</u>	<u>204</u>	<u>215</u>	<u>119</u>							
<u>11</u>	<u>IG11</u>	<u>209</u>	<u>216</u>	<u>116</u>							
<u>12</u>	<u>IG12</u>	<u>198</u>	<u>207</u>	<u>106</u>							

Additional Species: LMB, Pumpkinseed Sunfish, Crayfish

Comments: windy

Organics \_\_\_\_\_ Metals \_\_\_\_\_ Archive \_\_\_\_\_ Other \_\_\_\_\_



R.K

**DEPARTMENT OF FISH AND GAME  
FISH AND WILDLIFE  
WATER POLLUTION CONTROL LABORATORY**

2005 NIMBUS ROAD  
RANCHO CORDOVA, CA 95670  
PHONE (916) 358-2858 ATSS 8-434-2858 FAX (916) 985-4301

**LABORATORY REPORT**

<b>Name:</b>	Russ J. Kanz	<b>Lab Number:</b>	L-665-07
<b>Agency:</b>	State Water Resource Control Board	<b>Other Number:</b>	
<b>Address:</b>	P.O. Box 2000	<b>Date Sampled:</b>	11/05/07
<b>City:</b>	Sacramento, CA 95812-2000	<b>Date Received:</b>	11/15/07
		<b>Date Completed:</b>	02/14/08
		<b>Index-PCA Code:</b>	

**RE:** Microcystin analysis in mussels

**RESULTS OF CHEMICAL ANALYSIS:**

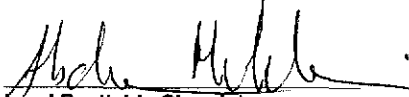
Fifteen mussel samples from the Klamath River Reservoir was extracted and analyzed by LC/MS/MS for microcystins. See attached sheets for results.

NA	Not Applicable
ND	Not Detected
MDL	Method Detection Limit
RL	Reporting Limit
LCS	Laboratory Control Spike
LCSD	Laboratory Control Spike Duplicate

RECEIVED  
 STATE WATER RESOURCE CONTROL BOARD  
 SACRAMENTO, CALIFORNIA  
 FEBRUARY 14 2008

Cost: To be invoiced per contract.

Cc: Susan Corum  
 Department of Natural Resources  
 P. O. Box 282  
 Orleans, CA 95556

  
 Lead Pesticide Chemist

02/15/08  
 Date

  
 Laboratory Director

2/15/08  
 Date

Klamath  
L-665-07

WPCL Lab#	Estimated MDL	Reporting Limit	L-665-07-1	L-665-07-2	L-665-07-3	L-665-07-4	L-665-07-5
Sample Identification			CH110507-A	CH110507-B	CH110507-C	BR110507-A	BR110507-B
Date Collected			05/Nov/2007	05/Nov/2007	05/Nov/2007	05/Nov/2007	05/Nov/2007
Time Collected			16:00	16:00	16:00	13:00	13:00
Date Received			15/Nov/2007	15/Nov/2007	15/Nov/2007	15/Nov/2007	15/Nov/2007
Date Extracted			06/Dec/2007	06/Dec/2007	06/Dec/2007	06/Dec/2007	06/Dec/2007
Date Analyzed			07/Dec/2007	07/Dec/2007	07/Dec/2007	07/Dec/2007	07/Dec/2007
Matrix			Mussel	Mussel	Mussel	Mussel	Mussel
Microcystin Analytes	ppb	ppb	Fresh Wt. ppb (ng/g)	Fresh Wt. ppb (ng/g)	Fresh Wt. ppb (ng/g)	Fresh Wt. ppb (ng/g)	Fresh Wt. ppb (ng/g)
MCY-RR	2.00	5.00	ND	ND	ND	ND	ND
MCY-Demethyl-RR*	2.00	5.00	ND	ND	ND	ND	ND
MCY-LR	2.00	5.00	ND	ND	ND	ND	ND
MCY-Demethyl-LR*	2.00	5.00	ND	ND	ND	ND	ND
MCY-YR	2.00	5.00	ND	ND	ND	ND	ND
MCY-LA	2.00	5.00	ND	ND	ND	ND	ND
MCY-LW	2.00	5.00	ND	ND	ND	ND	ND
MCY-LF	2.00	5.00	ND	ND	ND	ND	ND

\* Demethyl analog quantified as parent compound.

Klamath  
L-665-07

WPCL Lab#	Estimated MDL	Reporting Limit	L-665-07-6	L-665-07-7	L-665-07-8	L-665-07-9	L-665-07-10
Sample Identification			BR110507-C	SV110507-A	SV110507-B	SV110507-C	IS110507-A
Date Collected			05/Nov/2007	05/Nov/2007	05/Nov/2007	05/Nov/2007	05/Nov/2007
Time Collected			13:00	15:00	15:00	15:00	12:00
Date Received			15/Nov/2007	15/Nov/2007	15/Nov/2007	15/Nov/2007	15/Nov/2007
Date Extracted			06/Dec/2007	06/Dec/2007	06/Dec/2007	06/Dec/2007	06/Dec/2007
Date Analyzed			07/Dec/2007	07/Dec/2007	07/Dec/2007	07/Dec/2007	07/Dec/2007
Matrix			Mussel	Mussel	Mussel	Mussel	Mussel
Microcystin Analytes	ppb	ppb	Fresh Wt. ppb (ng/g)	Fresh Wt. ppb (ng/g)	Fresh Wt. ppb (ng/g)	Fresh Wt. ppb (ng/g)	Fresh Wt. ppb (ng/g)
MCY-RR	2.00	5.00	ND	ND	ND	ND	ND
MCY-Demethyl-RR*	2.00	5.00	ND	ND	ND	ND	ND
MCY-LR	2.00	5.00	ND	ND	ND	ND	ND
MCY-Demethyl-LR*	2.00	5.00	ND	ND	ND	ND	ND
MCY-YR	2.00	5.00	ND	ND	ND	ND	ND
MCY-LA	2.00	5.00	ND	ND	ND	ND	ND
MCY-LW	2.00	5.00	ND	ND	ND	ND	ND
MCY-LF	2.00	5.00	ND	ND	ND	ND	ND
* Demethyl analog quantified as parent compound.							



Klamath  
L-665-07

WPCL Lab#	Estimated MDL	Reporting Limit	L-665-07-11	L-665-07-11 Dup	L-665-07-12	L-665-07-13	L-665-07-14
<b>Sample Identification</b>			IS110507-B	IS110507-B	IS110507-C	OR110607-A	OR110607-B
<b>Date Collected</b>			05/Nov/2007 12:00	05/Nov/2007 12:00	05/Nov/2007 12:00	06/Nov/2007	06/Nov/2007
<b>Date Received</b>			15/Nov/2007	15/Nov/2007	15/Nov/2007	15/Nov/2007	15/Nov/2007
<b>Date Extracted</b>			06/Dec/2007	06/Dec/2007	06/Dec/2007	06/Dec/2007	06/Dec/2007
<b>Date Analyzed</b>			07/Dec/2007	07/Dec/2007	07/Dec/2007	07/Dec/2007	07/Dec/2007
<b>Matrix</b>			Mussel	Mussel	Mussel	Mussel	Mussel
<b>Microcystin Analytes</b>	<b>ppb</b>	<b>ppb</b>	<b>Fresh Wt.</b>	<b>Fresh Wt.</b>	<b>Fresh Wt.</b>	<b>Fresh Wt.</b>	<b>Fresh Wt.</b>
MCY-RR	2.00	5.00	ND	ND	ND	ND	ND
MCY-Demethyl-RR*	2.00	5.00	ND	ND	ND	ND	ND
MCY-LR	2.00	5.00	ND	ND	ND	ND	ND
MCY-Demethyl-LR*	2.00	5.00	ND	ND	ND	ND	ND
MCY-YR	2.00	5.00	ND	ND	ND	ND	ND
MCY-LA	2.00	5.00	ND	ND	ND	ND	ND
MCY-LW	2.00	5.00	ND	ND	ND	ND	ND
MCY-LF	2.00	5.00	ND	ND	ND	ND	ND
* Demethyl analog quantified as parent compound.							

Klamath  
L-665-07

WPCL Lab#	Estimated MDL	Reporting Limit	L-665-07-15	QA/QC Samples			
Sample Identification			OR110607-C	L-665-07-MBK	L-665-07-LCS	L-665-07-10MS	L-665-07-10MSD
Date Collected			06/Nov/2007	Solvent Blank	WPCL mussel	IS110507-A	IS110507-A
Time Collected						05/Nov/2007 12:00	05/Nov/2007 12:00
Date Received			15/Nov/2007			15/Nov/2007	15/Nov/2007
Date Extracted			06/Dec/2007	06/Dec/2007	06/Dec/2007	06/Dec/2007	06/Dec/2007
Date Analyzed			07/Dec/2007	07/Dec/2007	07/Dec/2007	07/Dec/2007	07/Dec/2007
Matrix			Mussel	Mussel	Mussel	Mussel	Mussel
Microcystin Analytes	ppb	ppb	Fresh Wt. ppb (ng/g)	ppb (ug/L)	Fresh Wt. Recovery (%)	Fresh Wt. Recovery (%)	Fresh Wt. Recovery (%)
MCY-RR	2.00	5.00	ND	ND	85.4	92.5	94.0
MCY-Demethyl-RR*	2.00	5.00	ND	ND	NA	NA	NA
MCY-LR	2.00	5.00	ND	ND	114	107	115
MCY-Demethyl-LR*	2.00	5.00	ND	ND	NA	NA	NA
MCY-YR	2.00	5.00	ND	ND	109	117	121
MCY-LA	2.00	5.00	ND	ND	82.5	74.5	75.6
MCY-LW	2.00	5.00	ND	ND	81.9	74.3	79.0
MCY-LF	2.00	5.00	ND	ND	85.9	71.5	78.1
* Demethyl analog quantified as parent compound.							

L-665-07

1/2

Chain of Custody for Klamath River Reservoir Nutrient Loading Study

<b>Karuk DNR</b>	39051 Hwy 96
PHONE 530-469-3456	Orleans, CA 95556
CONTACT Susan Corum	EMAIL scorum@karuk.us
Collected By <u>SC</u>	SIGNATURE <u>[Signature]</u>

Sample ID	Date	Time	Lab ID	Sample Description	Filter	Sample
1 CH110507-A	11/12/07	1600		China Flat Klamath River <del>Down</del> Right across from Happy Camp	X	Mussel Tissue
2 CH110507-B				"		
3 CH110507-C				"	X	
4 BR110507-A	11/5/07	1300		Brown Bear blw Swift + Shasta		
5 BR110507-B				"	X	
6 BR110507-C				"		
7 SV110507-A		1500		About 1/2 mile upstream Seiad Valley	X	
8 SV110507-B				"		
9 SV0110507-C				"	X	
10 IS110507-A		1200		Below I-5 Bridge Klamath River	X	
11 IS110507-B				"	X	
12						

Date Shipped: 11/14/07 Carrier/ Shipping # FedEx

Date Received \_\_\_\_\_

Received by \_\_\_\_\_

Notes DO NOT PROCESS Samples until you talk to Russ Kanz 11/15/07

Received - Gregor Baltzell

Ship to:

Dave Crane  
 CDFG Water Pollution Control Laboratory  
 2005 Nimbus Road  
 Rancho Cordova, CA 95670  
 (916) 358-2858  
 fax: (916) 985-4301

Bill and Send Results To:

Russ J. Kanz  
 State Water Resources Control Board  
 PO Box 2000  
 Sacramento, CA 95812-2000  
 (916) 341-5341

Also, please  
 Save mussel  
 shells for aging  
 + id confirmation

Please put mussel shells back in labeled bags  
 + return to Susan Corum

L-665-07  
2/2

Chain of Custody for Klamath River Reservoir Nutrient Loading Study

<b>Karuk DNR</b>	39051 Hwy 96
PHONE 530-469-3456	Orleans, CA 95556
CONTACT Susan Corum	EMAIL scorum@karuk.us
Collected By <i>SC</i>	SIGNATURE <i>[Signature]</i>

	Sample ID	Date	Time	Lab ID	Sample Description	Water	Tissue
1	OR110607-A	11/16/07			Under Orleans Bridge Klamath River	X	Mussel tissue
2	OR110607-B					X	
3	OR110607-C	✓				X	✓
4							
5							
6							
7							
8							
9							
10							
11							
12							

Date Shipped: 11/14/07 Carrier/ Shipping # \_\_\_\_\_

Date Received \_\_\_\_\_

Received by \_\_\_\_\_

Notes Please keep mussel shells w/ appropriate bags so we can ID + use @ later date  
 Ship to: \_\_\_\_\_ Bill and Send Results To: **THANKS!**

Dave Crane  
 CDFG Water Pollution Control Laboratory  
 2005 Nimbus Road  
 Rancho Cordova, CA 95670  
 (916) 358-2858  
 fax: (916) 985-4301

Russ J. Kanz  
 State Water Resources Control Board  
 PO Box 2000  
 Sacramento, CA 95812-2000  
 (916) 341-5341

*[Signature]*

Received  
 Gregor Baltzell 11-15-07



PK

**DEPARTMENT OF FISH AND GAME  
FISH AND WILDLIFE  
WATER POLLUTION CONTROL LABORATORY**

2005 NIMBUS ROAD  
RANCHO CORDOVA, CA 95670  
PHONE (916) 358-2858 ATSS 8-434-2858 FAX (916) 985-4301

**LABORATORY REPORT**

<b>Name:</b>	Russ J. Kanz	<b>Lab Number:</b>	L-387-08
<b>Agency:</b>	State Water Resource Control Board	<b>Other Number:</b>	
<b>Address:</b>	P. O. Box 2000	<b>Date Sampled:</b>	06/12/08
<b>City:</b>	Sacramento, CA 95812-2000	<b>Date Received:</b>	06/19/08
		<b>Date Completed:</b>	07/22/08
		<b>Index-PCA Code:</b>	

**RE:** Microcystin analysis in yellow perch

**RESULTS OF CHEMICAL ANALYSIS:**

Sixteen fish tissue samples and two liver composites from Copco Reservoir were extracted and analyzed by LC/MS/MS for microcystins. See attached sheets for results.

NA Not Applicable  
 ND Not Detected  
 MDL Method Detection Limit  
 RL Reporting Limit  
 LCS Laboratory Control Spike  
 MS Matrix Spike  
 MSD Matrix Spike Duplicate

Cost: To be invoiced per contract.

STATE WATER RESOURCE CONTROL BOARD  
 2009 AUG -6 PM 1:11  
 SACRAMENTO, CA

*A. Blondino*  
Project Chemist

8/3/08  
Date

*Arden Hill*  
Lead Pesticide Chemist

08/04/08  
Date

*R. Kane*  
Laboratory Director

8/4/08  
Date

**SWRCB**  
**L-387-08 (Yellow Perch)**

WPCL Lab#	Estimated MDL	Reporting Limit	L-387-08-1	L-387-08-2	L-387-08-3	L-387-08-4	L-387-08-5	L-387-08-5Dup
Sample Identification			CC1	CC2	CC3	CC4	CC5	CC5
Date Collected			12/Jun/2008	12/Jun/2008	12/Jun/2008	12/Jun/2008	12/Jun/2008	12/Jun/2008
Time Collected								
Date Received			19/Jun/2008	19/Jun/2008	19/Jun/2008	19/Jun/2008	19/Jun/2008	19/Jun/2008
Date Extracted			04/Jul/2008	04/Jul/2008	02/Jul/2008	02/Jul/2008	02/Jul/2008	02/Jul/2008
Date Analyzed			10/Jul/2008	10/Jul/2008	10/Jul/2008	10/Jul/2008	10/Jul/2008	10/Jul/2008
Matrix			fish tissue	fish tissue	fish tissue	fish tissue	fish tissue	fish tissue
<b>Biotoxin Analytes</b>	<b>ppb</b>	<b>ppb</b>	<b>ppb (ng/g)</b>	<b>ppb (ng/g)</b>	<b>ppb (ng/g)</b>	<b>ppb (ng/g)</b>	<b>ppb (ng/g)</b>	<b>ppb (ng/g)</b>
MCY-RR	0.50	1.00	ND	ND	ND	ND	ND	ND
MCY-Demethyl-RR*	0.50	1.00	ND	ND	ND	ND	ND	ND
MCY-LR	0.50	1.00	ND	ND	ND	ND	ND	ND
MCY-Demethyl-LR*	0.50	1.00	ND	ND	ND	ND	ND	ND
MCY-YR	0.50	1.00	ND	ND	ND	ND	ND	ND
MCY-LA	0.50	1.00	ND	ND	ND	ND	ND	ND
MCY-LW	0.50	1.00	ND	ND	ND	ND	ND	ND
MCY-LF	0.50	1.00	ND	ND	ND	ND	ND	ND
Domoic acid	1.000	2.00	ND	ND	ND	ND	ND	ND
* Demethyl-RR and -LR are quantified as parent analog compound.								

**SWRCB**  
**L-387-08 (Yellow Perch)**

WPCL Lab#	Estimated MDL	Reporting Limit	L-387-08-6	L-387-08-7	L-387-08-8	L-387-08-9	L-387-08-10	L-387-08-11
<b>Sample Identification</b>								
Date Collected			12/Jun/2008	12/Jun/2008	12/Jun/2008	12/Jun/2008	12/Jun/2008	12/Jun/2008
Time Collected							1400	1400
Date Received			19/Jun/2008	19/Jun/2008	19/Jun/2008	19/Jun/2008	19/Jun/2008	19/Jun/2008
Date Extracted			02/Jul/2008	04/Jul/2008	04/Jul/2008	02/Jul/2008	02/Jul/2008	02/Jul/2008
Date Analyzed			10/Jul/2008	10/Jul/2008	10/Jul/2008	10/Jul/2008	10/Jul/2008	10/Jul/2008
Matrix			fish tissue	fish tissue	fish tissue	liver comp.	fish tissue	fish tissue
<b>Biotoxin Analytes</b>	ppb	ppb	ppb (ng/g)	ppb (ng/g)	ppb (ng/g)	ppb (ng/g)	ppb (ng/g)	ppb (ng/g)
MCY-RR	0.50	1.00	ND	ND	ND	ND	ND	ND
MCY-Demethyl-RR*	0.50	1.00	ND	ND	ND	ND	ND	ND
MCY-LR	0.50	1.00	ND	ND	ND	ND	ND	ND
MCY-Demethyl-LR*	0.50	1.00	ND	ND	ND	ND	ND	ND
MCY-YR	0.50	1.00	ND	ND	ND	ND	ND	ND
MCY-LA	0.50	1.00	ND	ND	ND	ND	ND	ND
MCY-LW	0.50	1.00	ND	ND	ND	ND	ND	ND
MCY-LF	0.50	1.00	ND	ND	ND	ND	ND	ND
Domoic acid	1.000	2.00	ND	ND	ND	ND	ND	ND
* Demethyl-RR and -LR are quantified as parent analog compound.								

**SWRCB**  
**L-387-08 (Yellow Perch)**

WPCL Lab#	Estimated MDL	Reporting Limit	L-387-08-12	L-387-08-13	L-387-08-14	L-387-08-15	L-387-08-16	L-387-08-17
<b>Sample Identification</b>								
<b>Date Collected</b>			CR52 12/Jun/2008 1400	CR53 12/Jun/2008 1400	CR54 12/Jun/2008 1400	CR55 12/Jun/2008 1400	CR56 12/Jun/2008 1400	CR57 12/Jun/2008 1400
<b>Time Collected</b>								
<b>Date Received</b>			19/Jun/2008	19/Jun/2008	19/Jun/2008	19/Jun/2008	19/Jun/2008	19/Jun/2008
<b>Date Extracted</b>			02/Jul/2008	02/Jul/2008	02/Jul/2008	02/Jul/2008	02/Jul/2008	02/Jul/2008
<b>Date Analyzed</b>			10/Jul/2008	10/Jul/2008	10/Jul/2008	10/Jul/2008	10/Jul/2008	10/Jul/2008
<b>Matrix</b>			fish tissue	fish tissue	fish tissue	fish tissue	fish tissue	fish tissue
<b>Biotoxin Analytes</b>	ppb	ppb	ppb (ng/g)	ppb (ng/g)	ppb (ng/g)	ppb (ng/g)	ppb (ng/g)	ppb (ng/g)
MCY-RR	0.50	1.00	ND	ND	ND	ND	ND	ND
MCY-Demethyl-RR*	0.50	1.00	ND	ND	ND	ND	ND	ND
MCY-LR	0.50	1.00	ND	ND	ND	ND	ND	ND
MCY-Demethyl-LR*	0.50	1.00	ND	ND	ND	ND	ND	ND
MCY-YR	0.50	1.00	ND	ND	ND	ND	ND	ND
MCY-LA	0.50	1.00	ND	ND	ND	ND	ND	ND
MCY-LW	0.50	1.00	ND	ND	ND	ND	ND	ND
MCY-LF	0.50	1.00	ND	ND	ND	ND	ND	ND
Domoic acid	1.000	2.00	ND	ND	ND	ND	ND	ND
* Demethyl-RR and -LR are quantified as parent analog compound.								



**SWRCB**  
**L-387-08 (Yellow Perch)**

WPCL Lab#	Estimated MDL	Reporting Limit	L-387-08-18	L-387-08-LCS	L-387-08-6-MS	L-387-08-6-MSD
Sample Identification			CR50-57	WPCL-119-07	CC6	CC6
Date Collected			12/Jun/2008		12/Jun/2008	12/Jun/2008
Time Collected			1400			
Date Received			19/Jun/2008		19/Jun/2008	19/Jun/2008
Date Extracted			02/Jul/2008	02/Jul/2008	02/Jul/2008	02/Jul/2008
Date Analyzed			10/Jul/2008	10/Jul/2008	10/Jul/2008	10/Jul/2008
Matrix			liver comp.	fish tissue	fish tissue	fish tissue
<b>Biotoxin Analytes</b>	<b>ppb</b>	<b>ppb</b>	<b>ppb (ng/g)</b>	<b>% Recovery</b>	<b>% Recovery</b>	<b>% Recovery</b>
MCY-RR	0.50	1.00	ND	ND	118	115
MCY-Demethyl-RR*	0.50	1.00	ND	NA	NA	NA
MCY-LR	0.50	1.00	ND	116	107	108
MCY-Demethyl-LR*	0.50	1.00	ND	NA	NA	NA
MCY-YR	0.50	1.00	ND	98.0	112	109
MCY-LA	0.50	1.00	ND	67.5	61.3	62.1
MCY-LW	0.50	1.00	ND	76.0	74.4	68.7
MCY-LF	0.50	1.00	ND	54.5	58.5	57.8
Domoic acid	1.000	2.00	ND	NA	NA	NA

QA/QC Samples

\* Demethyl-RR and -LR are quantified as parent analog compound.



# DFG REQUEST FOR ANALYSIS AND CHAIN OF CUSTODY RECORD

**Sampler:** Susan Corum  
**Address:** PO Box 282  
**City:** Orleans  
**State:** CA  
**Zip:** 95556  
**Date Required/Reason:**  
**Shipped Via:**

**Send Results To:** Russ Krenz  
**Address:** PO Box 2000  
**City:** Sacramento CA  
**State:** CA  
**Zip:** 95812-2000  
**Copies To:** Susan Corum  
**Address:** PO Box 282  
**City:** Orleans CA  
**State:** CA  
**Zip:** 95556

**Lab Number:** L-387-08  
**Field Number:**  
**Lab Storage:**  
**Spill Title:**  
**Suspect:**  
**Index-PCA:**

Problem Description Suspect/Incident Location Comments/Special Instructions	Petroleum Fingerprint	Trace Elements (Specify Below)	Pesticides (Specify Below)	Microtox	F or C	pH	DO	mg/L Conductivity:			umhos/cm	
								Water	Filtered Water	Sample Type		Number of Containers
Coppo Reservoir 9 Cape Cove Yellow Perch 10 Mallard cove yellow perch				XXXXXX								
				Microtox								

**Analysis Requested >>>**

Analysis	Date	Time
Microtox	4/17/08	

**Water Temp:** \_\_\_\_\_ **F or C:** \_\_\_\_\_ **pH:** \_\_\_\_\_ **DO:** \_\_\_\_\_

**Sample Type:** Water, Filtered Water, Soil, Tissue, VOA Vial

**Number of Containers:** Glass, Plastic

**Preservation:** Acid

**Pollution Action Kit:** Yes  No

**Glove Size:** Large  Medium

**Hazmat Shipper Requested:** Yes  No

**Print Name:** Susan Corum  
**Date:** 4/18/08

**Received By (signature):** [Signature]  
**Print Name:** GREER BAZZEL  
**Date:** 6-17-08

Pesticide Investigations Lab  
 1701 Nimbus Road  
 Rancho Cordova, CA 95670  
 (916) 358-2950

Petroleum Chemistry Lab  
 1995 Nimbus Road  
 Rancho Cordova, CA 95670  
 (916) 358-2803

Water Pollution Control Lab  
 2005 Nimbus Road  
 Rancho Cordova, CA 95670  
 (916) 358-2858

Tissue Sampling Field Sheet

Sheet | of |

Project: Copco Reservoir Perch/microcystin

Lab Code:

Date: 06/12/2008

Samplers:

Time: 1400 hrs

Tim Wilhite  
Ron Presley

Station Description: Mallard Cove

County: Siskiyou

Lat:

Long:

L-387-08

ID#	FL cm	TL cm	WT g	ID#	FL	TL	WT
CR50	23.5	24.3	159				
CR51	23.5	25.0	148				
CR52	17.5	18.1	66				
CR53	20.2	21.0	93				
CR54	16.6	17.1	53				
CR55	15.0	15.9	45				
CR56	15.5	16.2	42				
CR57	15.8	16.2	43				
CR58	14.6	15.8	42				
CR59	15.0	16.6	44				

Additional Species:

Comments

All fish caught were yellow perch

Organics

Metals

Archive

Other

Cosco Cove  
Yellow Perch  
6/12/08

L-387-08

ID	Fork length (mm)	wt. (grams)
1 CC1	159	56.78
2 CC2	188	74.14
3 CC3	200	86.06
4 CC4	164	52.04
5 CC5	169	54.38
6 CC6	193	83.02
7 CC7	187	63.16
8 CC8	195	78.62
CC9	138	30.64

Collected by Tim Wilhite - USEPA  
Packaged + measured by Susan Corum -  
Kank Tibe



PK

**DEPARTMENT OF FISH AND GAME  
FISH AND WILDLIFE  
WATER POLLUTION CONTROL LABORATORY**

2005 NIMBUS ROAD  
RANCHO CORDOVA, CA 95670  
PHONE (916) 358-2858 ATSS 8-434-2858 FAX (916) 985-4301

**LABORATORY REPORT**

<b>Name:</b>	Russ J. Kanz	<b>Lab Number:</b>	L-722-07
<b>Agency:</b>	State Water Resource Control Board	<b>Other Number:</b>	
<b>Address:</b>	P. O. Box 2000	<b>Date Sampled:</b>	07/23-09/19/07
<b>City:</b>	Sacramento, CA 95812-2000	<b>Date Received:</b>	12/12/07
		<b>Date Completed:</b>	07/23/08
		<b>Index-PCA Code:</b>	

**RE:** Microcystin analysis in water

**RESULTS OF CHEMICAL ANALYSIS:**

Nine water samples from Klamath River were extracted and analyzed by LC/MS/MS for microcystins. These samples were previously frozen and sonicated at EPA Region 9 lab. See attached sheets for results.

NA	Not Applicable
ND	Not Detected
MDL	Method Detection Limit
RL	Reporting Limit
MBik	Method Blank
LCS	Laboratory Control Spike
LCSD	Laboratory Control Spike Duplicate
MS	Matrix Spike
MSD	Matrix Spike Duplicate

Cost: To be invoiced per contract.

RECEIVED  
 AUG 6 PM 1:10  
 STATE WATER RESOURCE CONTROL BOARD  
 SACRAMENTO, CA

*[Signature]*  
Project Chemist

8/3/08  
Date

*[Signature]*  
Lead Pesticide Chemist

08/04/08  
Date

*[Signature]*  
Laboratory Director

8/4/08  
Date

Klamath  
L-722-07

WPCL Lab#	Estimated MDL	Reporting Limit	L-722-07-1	L-722-07-2	L-722-07-3	L-722-07-4	L-722-07-5
Sample Identification			CRC072307-SG	IR01072407-OO	CR01072407-OO	CRC082107-SG	IR01082207-OO
Date Collected			23/Jul/2007	24/Jul/2007	24/Jul/2007	21/Aug/2007	22/Aug/2007
Time Collected			15:20	12:00	10:00	0:00	15:00
Date Received			12/Dec/2007	12/Dec/2007	12/Dec/2007	12/Dec/2007	12/Dec/2007
Date Extracted			12/Jul/2008	12/Jul/2008	12/Jul/2008	12/Jul/2008	12/Jul/2008
Date Analyzed			19/Jul/2008	19/Jul/2008	19/Jul/2008	19/Jul/2008	19/Jul/2008
Matrix			Water	Water	Water	Water	Water
Microcystin Analytes	ppb (µg/L)	ppb (µg/L)	ppb (µg/L)	ppb (µg/L)	ppb (µg/L)	ppb (µg/L)	ppb (µg/L)
MCY-RR	0.50	1.00	ND	ND	1.67	407	ND
MCY-Demethyl-RR*	0.50	1.00	ND	ND	ND	ND	ND
MCY-LR	0.50	1.00	ND	ND	27.6	2,000	3.93
MCY-Demethyl-LR*	0.50	1.00	ND	ND	ND	ND	ND
MCY-YR	0.50	1.00	ND	ND	ND	369	ND
MCY-LA	0.50	1.00	ND	ND	1,070	18,400	37.4
MCY-LW	0.50	1.00	ND	ND	ND	ND	ND
MCY-LF	0.50	1.00	ND	ND	1.20	47.1	ND

\* Demethyl analog quantified as parent compound.

Klamath  
L-722-07

WPCL Lab#	Estimated MDL	Reporting Limit	L-722-07-6	L-722-07-6 Dup	L-722-07-7	L-722-07-8	L-722-07-9
Sample Identification			CR01082307-OO	CR01082307-OO	KRB1091807-OC	IRJW091807-SG	CR01091907-OO
Date Collected			23/Aug/2007	23/Aug/2007	18/Sep/2007	18/Sep/2007	19/Sep/2007
Time Collected			10:20	10:20	13:40	15:25	9:50
Date Received			12/Dec/2007	12/Dec/2007	12/Dec/2007	12/Dec/2007	12/Dec/2007
Date Extracted			12/Jul/2008	12/Jul/2008	12/Jul/2008	12/Jul/2008	12/Jul/2008
Date Analyzed			19/Jul/2008	19/Jul/2008	19/Jul/2008	19/Jul/2008	19/Jul/2008
Matrix			Water	Water	Water	Water	Water
Microcystin Analytes	ppb (µg/L)	ppb (µg/L)	ppb (µg/L)	ppb (µg/L)	ppb (µg/L)	ppb (µg/L)	ppb (µg/L)
MCY-RR	0.50	1.00	0.671	0.702	ND	ND	ND
MCY-Demethyl-RR*	0.50	1.00	ND	ND	ND	ND	ND
MCY-LR	0.50	1.00	6.68	6.49	ND	ND	ND
MCY-Demethyl-LR*	0.50	1.00	ND	ND	ND	ND	ND
MCY-YR	0.50	1.00	ND	ND	ND	ND	ND
MCY-LA	0.50	1.00	36.1	35.6	ND	ND	ND
MCY-LW	0.50	1.00	ND	ND	ND	ND	ND
MCY-LF	0.50	1.00	ND	ND	ND	ND	ND

\* Demethyl analog quantified as parent compound.

Klamath  
L-722-07

WPCL Lab#	Estimated MDL	Reporting Limit	QA/QC Samples				
Sample Identification			ppb (ug/L)	Recovery (%)	Recovery (%)	Recovery (%)	Recovery (%)
Date Collected							
Time Collected							
Date Received							
Date Extracted							
Date Analyzed							
Matrix							
Microcystin Analytes	ppb (ug/L)	ppb (ug/L)	ppb (ug/L)	Recovery (%)	Recovery (%)	Recovery (%)	Recovery (%)
MCY-RR	0.50	1.00	ND	87.5	89.7	99.1	99.7
MCY-Demethyl-RR*	0.50	1.00	ND	NA	NA	NA	NA
MCY-LR	0.50	1.00	ND	95.3	97.5	95.0	97.3
MCY-Demethyl-LR*	0.50	1.00	ND	NA	NA	NA	NA
MCY-YR	0.50	1.00	ND	96.1	95.8	95.1	99.1
MCY-LA	0.50	1.00	ND	95.0	92.4	83.2	82.0
MCY-LW	0.50	1.00	ND	82.7	80.0	26.0	13.0
MCY-LF	0.50	1.00	ND	81.0	74.1	11.0	7.60

\* Demethyl analog quantified as parent compound.



CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME	SAMPLERS: (Signature)		NO. OF CON-TAINERS	REMARKS						
	KLAMATH RIVER	SUSAN CORUM			L-722-07						
DATE	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION						
7/23/07	1520	W		X	CRCC-072307-SG	1	X				
7/24/07	1200	W		X	IR01-072407-00	1	X				
7/24/07	1000	W		X	CR01-072407-00	1	X				
8/21/07	0000	W		X	CRCC-082107-SG	1	X				
8/22/07	1500	W		X	IR01-082207-00	1	X				
8/23/07	1020	W		X	CR01-082307-00	1	X				
9/18/07	1340	W		X	KRBT-091807-OC	1	X				
9/18/07	1525	W		X	IRJW-091807-SG	1	X				
9/19/07	0950	W		X	CR01-091907-00	1	X				
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)	
<i>[Signature]</i>		12/11/07 1400		<i>[Signature]</i>		<i>[Signature]</i>		12-12-07 10:00		<i>[Signature]</i>	
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)	
Received for Laboratory by: (Signature)		Date / Time		Temp.		Seals Intact (Y/N)		Conditions / Remarks			
								SAMPLES PREVIOUSLY FROZEN AND SOLICATED AT EPA REGION 9 LAB. ANDREW LINGGIF SZD-412-2330			

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files