Appendix B

Cadmium Delisting

Used in the Chollas Creek Metals Total Maximum Daily Loads

California Regional Water Quality Control Board, San Diego Region

PUBIC R EVIEW DR AFT
28 March 2005

Chollas Creek □Cadmium Delisting
Hydrologic Subarea 908.22

SUMMARY OF ACTIONS

Non-consideration of dissolved cadmium for Total Maximum Daily Load (TMDL) and subsequent removal from the list of Water Quality Limited Segments [Clean Water Act (CWA) section 303(d)].

TMDL PRIORITY

Non-consideration.

LIST Of WATER QUALITY LIMITED SEGMENTS

Proposed delisting.

WATERSHED CHARACTERISTICS

Chollas Creek is an urban creek that runs through portions of San Diego, La Mesa, and Lemon Grove before emptying into San Diego Bay. Chollas Creek is designated with water contact recreation (REC-1) as a potential beneficial use as well as the following existing beneficial uses: non-contact water recreation (REC-2), warm freshwater habitat (WARM), and wildlife habitat (WILD). San Diego Bay is designated with the following beneficial uses: industrial service supply (IND), navigation (NAV), REC-1, REC-2, commercial and sport fishing (COMM), preservation for biological habitats of special significance (BIOL), estuarine habitat (EST), wildlife habitat (WILD), rare, threatened, or endangered species (RARE), marine habitat (MAR), migration of aquatic organisms (MIGR), and shellfish harvesting (SHELL) (Regional Board, 1994).

EVIDENCE OF NON-IMPAIRMENT

The available data suggests that concentrations of dissolved cadmium in Chollas Creek do not exceed acute or chronic California Toxics Rule (CTR) water quality criteria. Most samples were below detection limits, though some of the detection limit concentrations exceed CTR acute and chronic criteria. Since cadmium does not appear to exceed dissolved CTR criteria, and was not found to cause toxicity in test organisms, it is not considered an agent for the impairment of designated beneficial uses. Based on this evidence, removal of the pollutant/water body combination of cadmium and Chollas Creek from the List of Water Quality Limited Segments will be recommended by the California Regional Water Quality Control Board, San Diego Region (Regional Board).

The United States Environmental Protection Agency (USEPA) has recommended a more stringent dissolved cadmium criteria (USEPA, 2001) that it hopes California will incorporate in to the CTR by 2008. These criteria are approximately ten-fold more stringent than current CTR criteria, and may be exceeded in Chollas Creek. The available cadmium data appears to support inclusion on subsequent Water Quality Limited Segments lists based on this more stringent recommended criteria. When CTR is updated to incorporate these criteria, the Regional Board will re-evaluate the potential listing of Chollas Creek for cadmium.

As shown in the Table D.1 below, with a total of 54 samples collected and analyzed between February 2000 and February 2004, no (0 percent) exceedances of the CTR for dissolved cadmium were recorded.

Table D.1. SUMMARY OF SAMPLING EVIDENCE FOR DELISTING

CADMIUM							No. of exceedances (CTR)		No. of exceedances (USEPA, 2001)	
Collection Dates	Organization	n	min	max	mean	median	CMC	CCC	CMC	CCC
Feb 94 - Feb 03	MS4 Copermittees	42	0.2 [a]	3.93 [b]	0.8 [c]	0.5 [c]	0 [d] (4)	0 [d] (4)	0 [d] (4)	3 [d] (4)
Feb 00 - Apr 00	CalTrans	4	0.2 [a]	0.3	0.2 [c]	0.2 [c]	NA [e]	NA [e]	NA [e]	NA [e]
Mar 99 - Apr 99	SCCWRP	3	< 0.3	< 2.0	< 2.0	< 2.0	NA [f]	NA [f]	NA [f]	NA [f]
Jun 91 & Mar 92	Regional Board	5	1.0 [a]	< 1.0	0.5 [c]	0.5 [c]	NA [f]	NA [f]	NA [f]	NA [f]

a. Sample below Reporting Limit.
b. Calculated from total concentration.
c. Using all samples (measured dissolved and calculated from total). Samples below detection limit entered as 1/2 detection limit for calculations.
d. Considering only measured dissolved concentrations and samples not below DL or RL. (Number in parenthesis represents available sample pool under these criteria).
e. No associated hardness values available.
f. All samples reported as "less than."

Applying the listing policy (SWRCB, 2004) to the available cadmium data confirms that cadmium should be delisted (Table D.2). In applying the policy, total metal data and metals data without associated hardness were not considered. As seen in the table, when and if the CTR is updated to include the new cadmium criteria from the USEPA, it may be necessary to re-list cadmium. At that future time, additional data should be available to evaluate the concentrations of cadmium in the creek. Until then and in accordance with the listing policy, cadmium should be removed from the current list of water quality limited segments during the next list update.

Table D.2. 303(d) Listing Summary

	CTR		USEPA, 2001	
	CMC	CCC	CMC	CCC
No. of samples appropriate for 303(d) listing consideration	47	42	41	19
No. of exceedances	0	1	3	13
List Decision	delist	delist	delist	list

EXTENT OF NON-IMPAIRMENT

Major branches of the contributing watershed were sampled as well as the main channel. The exact locations and descriptions are as follows:

A. **Main Chollas Channel** - Station Name SD8(1). (Longitude: 117 07.2995 Latitude: 32 42.2914) North Fork, south of Imperial Avenue. This station is located in a concrete-lined

section of the creek at the end of the 3300 block of Durant Street, near the intersection of 33rd Street, in the City of San Diego.

B. **Wabash Avenue Branch of the Main Chollas Channel** - Station Name SD8(2). (Longitude: 117 07.1140 Latitude: 32 43.0917) North Fork, located just north of the State Highway 94 and Interstate-15 Interchange.
C. **Home Avenue Branch of Main Chollas Channel** - Station Name SD8(3). (Longitude: 117 06.6055 Latitude: 32 43.1619) Located next to the San Diego Police Department canine training field and the Police Pistol Range and is downstream from residential areas. This area tends to remain wet year-round as a result of irrigation runoff from upstream residential areas. This portion of the creek is channelized, but has a natural bottom.
D. **South Chollas Creek at 38th Street** - Station Name SD8(4). Located in Chollas Creek at the 38th Street Bridge, just north of Beta Street and several blocks east of Interstate 5. The station is located in a channelized portion of the creek and has a natural bottom. It is approximately 4 blocks upstream of the confluence with the north fork of Chollas Creek. This station is located within a designated open space area and the wetland water quality study area for the Chollas Creek Enhancement Project.
E. **Federal Boulevard Branch of South Chollas Creek** - Station Name SD8(5). (Longitude: 117 04.1844 Latitude: 32 43.6324) Located in Chollas Creek at the 38th Street Bridge, just north of Beta Street and several blocks east of Interstate 5. The station is located in a channelized portion of the creek and has a natural bottom. It is approximately 4 blocks upstream of the confluence with the north fork of Chollas Creek. This station is located within a designated open space area and the wetland water quality study area for the Chollas Creek Enhancement Project.
F. **Jamacha Road Branch of South Chollas Creek** - Station Name SD8(6). (Longitude: 117 02.9650 Latitude: 32 42.6029) Located just south of Jamacha Road at the 69th Street crossing of South Chollas Creek. The station is located just downstream from Lemon Grove and upstream of designated open space. The station is along a natural portion of the creek within a residential area and is typically wet all year long.

Based on the locations and results of the samples, non-impairment of dissolved cadmium can be determined. Data from all stations indicates that the entire watershed is free from dissolved cadmium impairment.

INFORMATION SOURCES

Regional Board, 1994. *Water Quality Control Plan for the San Diego Basin (9), 1994.* California Regional Water Quality Control Board, San Diego Region.

USEPA, 2001. *2001 Update of Ambient Water Quality Criteria for Cadmium, 2001.* United States Environmental Protection Agency, EPA-822-R-01-001.

SWRCB, 2004. *Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List, 2004.* State Water Resources Control Board, September2004.

9-347

Prepared by Brennan Ott
8/6/01

Chollas Creek
908.22

already listed 273

Data show evidence of water quality impairment because of diazinon and copper.

Water Quality Objectives not Obtained
Chollas Creek was found to be in violation for inland surface water quality standards for diazinon, turbidity, copper, zinc, and lead.

Evidence of Impairment
All dates and locations that the above said violations took place and the concentrations of the pollutants are summarized in the attached table. The water quality standard for inland surface waters for turbidity is 20 NTU, 0.013 mg/l for copper, 0.120 mg/l for zinc, and 0.65 mg/l for lead. The standard for diazinon is 0.05 ug/l.

Extent of Impairment
Chollas Creek was sampled between November 10, 1997 and March 5, 2000 at sampling station SD8. No actual site location is given as the where the samplings station SD 8 is located along the Chollas Creek or what the surrounding area is. Plus, water quality data is only provided for nine days during this sampling period. Turbidity was above the allowable limit all nine times it was tested for. Zinc was only high once and lead was in exceedance twice. Copper was high seven of the nine sampling dates. Diazinon was well in exceedance all six of the nine times it was tested for, with an average value of 0.25 ug/l.

Potential Sources
Since the creek was sampled during wet weather flow, elevated levels of turbidity and heavy metals (zinc, lead, and copper) can be related to stormwater runoff. However, there is not enough data available (i.e. dry weather flow) to solidify this assumption. Diazinon is known pesticide, so it too is possibly from runoff either from lawns or farmland.

TMDL Priority
Tecolote Creekbe is already listed as impaired for copper. It was also listed for toxicity on the 1998 303(d) list. Subsequent toxicity identification evaluation studies have shown that diazinon is one of the causes. Total Maximum Daily Loads (TMDLs) are underway for both constituents.

Source References
Water quality standards were taken from the Water Quality Control Plan for the San Diego Basin. Water quality data is taken from the 1997-1998, 1998-1999, and 1999-2000 City of San Diego and Co-Permitte NPDES Stormwater Monitoring Program Report.

08/17/01
Edited by jgs

Date	Location	Turbidity	Diazinon	Copper	Zinc	Lead
11/10/97	Chollas Creek	90	ND	0.017	176	ND
12/6/97	Chollas Creek	29	ND	0.028	ND	ND
3/14/98	Chollas Creek	24	ND	0.028	ND	0.095
11/8/98	Chollas Creek	69	0.46	ND	ND	ND
1/25/99	Chollas Creek	38	0.46	ND	ND	ND
3/15/99	Chollas Creek	21	0.53	0.015	0.21	ND
2/12/00	Chollas Creek	50	0.27	0.029	ND	ND
2/20/00	Chollas Creek	27	0.35	0.016	ND	ND
3/5/00	Chollas Creek	38	0.2	0.014	ND	ND

*Turbidity in NTU,diazinon in ug/l, all else in mg/l

Kyle Olewnik

303(d) Fact Sheet Region 9 Water Quality Control Board

Summary of Proposed Action

HU 908.22 Chollas Creek pictures of **collected trash** were reviewed and it was not determined to be sufficient evidence to list Chollas Creek on the 303d list for impairment for trash at this time. However, a potential trash problem exists, and this waterbody should be considered as a threatened waterbody from trash as a pollutant.

303(d) Listing / TMDL Information

- Chollas Creek
- HU 908.22
- Potential pollutants: Trash

Watershed Characteristics

Chollas Creek is an urban creek that runs through portions of San Diego, La Mesa, and Lemon Grove, and terminates at the Mouth of Chollas Creek in San Diego Bay. Much of the creek is channelized.

Water Quality Objectives Not Attained (or Objectives being Attained for Delisting)

None (other than current listing)

Evidence of Impairment

Photographs of trash collected by a US Navy boom at the Mouth of Chollas Creek indicate a significant amount of trash being collected following a wet weather event. However, no additional information other than these photos is available to document a potential trash problem in Chollas Creek. In addition, trash is a pervasive problem in most urban settings and may not be notably more significant for this creek than other urban creeks. Additional information would be needed before making a determination that Chollas Creek should be listed as impaired for trash on 303d. It is recommended that this waterbody be listed as threatened on 305b, as additional investigation of this potential impairment may be warranted.

Extent of Impairment (or Extent of Attainment)

None (other than current listing)

Potential Sources

Urban nonpoint

TMDL Priority

This water body is not recommended for a new TMDL.

Information Sources

Photos of the Mouth of Chollas Creek provided by the US Navy

From: Kyle Olewnik
To: "breznik@sdbaykeeper.org".mime.Internet; Pardy, Linda; Sarabia, Hiram
Date: 7/23/01 11:03AM
Subject: Re: FW: TRASH EXAMPLE AT CHOLLAS CREEK

Hi Bruce,

We had this info and have been considering it for a TMDL. At the least, I believe we will be listing it so that additional information on this issue is required, even if we don't schedule it for a TMDL at this point. Thanks for keeping us informed.

Kyle

>>> "breznik" <breznik@sdbaykeeper.org> 07/23/01 10:50AM >>>
FYI (a picture tells a thousand words)....should we be considering a trash TMDL for Chollas?

br

-----Original Message-----
From: Friedman, Randal A (NRSW N453)
[mailto:Friedman.Randal.A@asw.cnrsw.navy.mil]
Sent: Monday, July 23, 2001 10:33 AM
To: 'tmdls@paradiesproductions.com'
Subject: TRASH EXAMPLE AT CHOLLAS CREEK

At the last PAG meeting I brought up the need to consider in TMDL program development the development/implementation of multi-agency agreements. Spending a great deal of time on a numeric goal won't solve the problem of the widely dispersed nature of stormwater. The example I used was the trash example at Naval Station San Diego this winter.

The Navy placed an oil-spill boom across Chollas Creek as part of our oil-spill program. The purpose of the boom is , the boom will prevent any oil spill from moving upstream with the high tide. What this boom did, however, was create a dam blocking the trash from a major storm.

The attached picture shows a scene from this. We estimate that about 5 tons of materials were blocked. We made repeated efforts with city/county government to get the trash picked up. Without any quick agreement the boom finally broke and all this trash went into the bay (where it would have gone anyway without the boom.) Since then we are making ongoing efforts, with limited success, to reach agreement before the next rainy season and this process is repeated. Our shore installation budget won't allow for us to pick-up and dispose of this material coming from this solidly urbanized watershed reaching as far as La Mesa ten miles away.

I would ask that my fellow PAG members think about what types of institutional changes might be necessary to implement TMDLs. Whether it is trash or pesticides, the overwhelming amount of materials come from upstream. It is not reasonable or feasible to expect landowners at the bottom of a watershed to carry this burden. Randy

Randal Friedman
California Governmental Affairs

Navy Region Southwest
(619) 524-6358
(619) 954-3684 mobile

From: "breznik" <breznik@sdbaykeeper.org>
To: "Kyle Olewnik" <olewk@rb9.swrcb.ca.gov>, "Hiram Sarabia" <hsarabia@sdbaykeeper.org>, "Linda Pardy" <pardl@rb9.swrcb.ca.gov>
Date: 7/23/01 10:50AM
Subject: FW: TRASH EXAMPLE AT CHOLLAS CREEK

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Randal Friedman
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(619) 524-6358
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Chollas Creek

From: Linda Pardy
To: Deborah Jayne; Keri Cole; Kyle Olewnik; Lisa Brown
Date: 3/14/01 4:23PM
Subject: Fwd: Meeting with Navy (TRASH 303d listing)

Kyle, Maybe. We'll have to meet w/everyone working on 303(d) list and figure out how we want to proceed to list for trash...I'm thinking most of our urban streams,estuaries, bays look like this after rains especially if we had booms to collect the trash...Should where the trash ends up be listed or where it originates from upstream...
First step would be to see how other Regions proceeded...Lesley and/or Joan has the Ballona Creek Trash TMDL (also check LA River TMDL)...and how much evidence would we want to collect to convince the RB and others there is an impairment? If we looked, we might find this to be a very pervasive problem in urban areas...how should we proceed? Is a TMDL the best alternative...is there a better way...do we need to look at some of our other streams (to be fair).... This will be among things to discuss. Is there value to a 303(d) listing or can we approach the problem another way? By the way, the Tijuana River is already listed for trash...Would this complement other TMDLs in the creek...What about storm water permit, how does this fit in? What about funding...can we get $$ to solve the problem now? what about storm water ordinances? do we want to wait for a TMDL...it might be a while before we could solve the problem...what can be done now...what's the best way to correct this...where is the best place to start...I've seen tons of trash even in the most beautiful watercourses because of road crossings and the highway litterbug....its one reason the toll road being planned over San Mateo Creek (our southern steelhead water) would be another source of pollutants to a unique natural area/stream (if planned construction goes through). -Linda

CC: Joan Brackin; Lesley Dobalian

From: Kyle Olewnik
To: Pardy, Linda
Date: 3/14/01 2:46PM
Subject: Fwd: Meeting with Navy

Linda, here is the pic I was telling you about - if you wanted to do a trash TMDL for Chollas - this would justify it, huh?

From: Alan Monji
To: Olewnik, Kyle
Date: 1/23/01 10:12AM
Subject: Meeting with Navy

My schedule is open in the morning and I am interested. (I am always up for a chance to eat at Point Loma Seafoods after the meeting too.)

Here is a recent photo of mouth of Chollas provided by the Navy to JR after the recent storms. Find the soccer ball and win a prize.

AM

From: Linda Pardy
To: Deborah Jayne; Erick Burres; Keri Cole; Lisa Brown
Date: 3/14/01 4:45PM
Subject: Fwd: Meeting with Navy (TRASH 303d listing)

Staff, It would be interesting to utilize citizen monitors for documenting the scope of the Trash problem in our rivers and streams (snapshot day). It's measurable, and might be a bit easier to start with than some other types of analytical measurements for citizens (like diazinon). The photos could be linked to our WBS/WQA/GIS and help us to prioritize clean up activities. How would we quantify the extent of the problem, or should we worry about this now/later? I know we are limited in staff, but this might be something citizens could measure for us w/photos. We would need to give them guidance of course, but it might help us in selecting the biggest problems first...
-Linda

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Linda Pardy, Environmental Specialist
California Regional Water Quality Control Board
San Diego Region
9771 Clairemont Mesa Blvd, Suite A
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(858) 627-3932, fax (858) 571-6972
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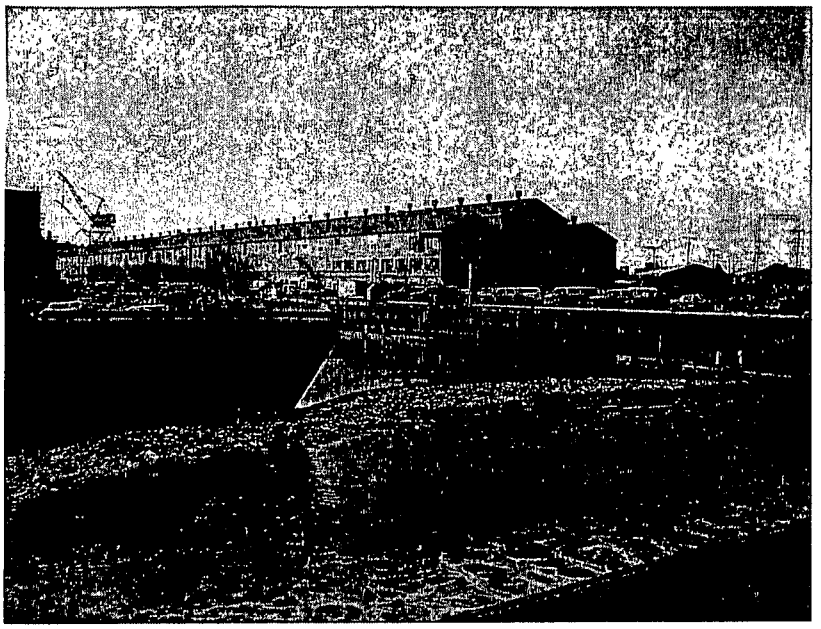
email <PARDL@RB9.SWRCB.CA.GOV>
Internet Address <www.swrcb.ca.gov/~rwqcb9>
Primary Office Phone Number (858) 467-2952
><> ><> ><> ><> ><> ><> >>>: ><> >>>:

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways to reduce demand and cut your energy costs, see the tips at: http://www.swrcb.ca.gov/news/echallenge.html

CC: Cynthia Gorham-Test; David Barker; David Gibson; Joan Brackin



L. Pandy 9-3

Chollas

Introduction:

Chollas Creek was placed on the 303(d) list of "Water Quality Limited" waterbodies in 1998 because metals and toxicity data indicate that beneficial uses in the creek may be impaired. According to data collected under the San Diego Municipal NPDES storm water permit, storm water runoff in Chollas Creek contains concentrations of cadmium, copper, lead and zinc which would be expected to impair aquatic life beneficial uses. Chollas Creek storm water runoff also causes toxicity to *Ceriodaphnia dubia.*

Metals

Existing EPA and/or ISWP water quality objectives for the protection of freshwater aquatic life were consistently achieved for all metals except cadmium, copper, lead and zinc. Measurements of total recoverable metals from Chollas Creek (SD8) indicate that chronic water quality objectives (4-day average) were commonly exceeded for cadmium, copper, lead and zinc. Acute water quality objectives (1 hour average) for copper, lead, and zinc were also frequently exceeded at SD-8 Chollas storm water mass loading station. SD-8 Chollas is located on the north fork of Chollas Creek near the intersection of 33rd and Durant Streets, just east of the Durant Street cul-de-sac in the City of San Diego. The Chollas Creek watershed is divided upstream into the north fork (9,276 acres) and the south fork (6,997 acres). Runoff from approx 57% of the entire watershed is sampled at the monitoring site. Watershed is highly urbanized and over 80% is developed. Land use is 67% residential, 7% industrial and 5% commercial.

- Copper

Mass Loading Station	Storm Date	Hardness (mg/l)	Total Copper (ug/l)	Water Quality Objective (Acute) 1 hour Average (ug/l)	Water Quality Objective (Chronic) 4 day Average (ug/l)	Exceedance Factor 1 hour Average	Exceedance Factor 4 day Average
SD8	11/10/94	150	36	26	17	1.38	2.12
	1/11/95	58	17	11	7.4	1.55	2.30
	2/14/95	100	40	18	12	2.22	3.33
	4/16/95	120	85	21	14	4.05	6.07
	11/1/95	91	46	16	10.9	2.84	4.22
	1993-98		33 +/- 19				

Mass Loading Station	Storm Date	Hardness (mg/l)	Dissolved Copper (ug/l)	Water Quality Objective 1 hour Average (ug/l)	Water Quality Objective 4 day Average (ug/l)	Exceedance Factor 1 hour Average	Exceedance Factor 4 day Average
SD8	11/10/94	150	13	22	14	0.59	0.93
	1/11/95	58	ND	9.0	6.3		
	2/14/95	100	5.4	15	10	0.36	0.54
	4/16/95	120	9.7	18	12	0.54	0.81
	11/1/95	91	NA	14	9.3		
	1/22/96	74.5	12	11	7.8	1.09	1.54
	1/31/96	52.2	8	8	5.8	1.00	1.38
	3/5/96	78.6	34	12	8.2	2.83	4.15
	12/9/96	57	10	10.1	7.1	1.00	1.41
	1/15/97	62	20	10.8	7.5	1.85	2.67

1/31/96	52.2	2	18	0.3	0.11	6.67
3/5/96	78.6	18	30	0.6	0.6	30
12/9/96	57	15	35.1	1.4	0.43	10.7
1/15/97	62	7	37.9	1.5	0.18	4.67

- Zinc

Mass Loading Station	Storm Date	Hardness (mg/l)	Total Zinc (ug/l)	Water Quality Objective (Acute) 1 hour Average (ug/l)	Water Quality Objective (Chronic) 4 day Average (ug/l)	Exceedance Factor 1 hour Average	Exceedance Factor 4 day Average
SD8	11/10/94	150	180	165	149	1.09	1.21
	1/11/95	58	150	74	67	2.03	2.24
	2/14/95	100	360	117	106	3.08	3.40
	4/16/95	120	560	137	124	4.09	4.52
	11/1/95	91	185	108	98	1.71	1.89
	1/22/96	74.5	NA	91	83		
	1/31/96	52.2	NA	67	61		
	3/5/96	78.6	NA	95	86		

Mass Loading Station	Storm Date	Hardness (mg/l)	Dissolved Zinc (ug/l)	Water Quality Objective 1 hour Average (ug/l)	Water Quality Objective 4 day Average (ug/l)	Exceedance Factor 1 hour Average	Exceedance Factor 4 day Average
SD8	11/10/94	150	70	140	127	0.5	0.55
	1/11/95	58	14	63	57	0.22	0.25
	2/14/95	100	12	99	90	0.12	0.13
	4/16/95	120	69	116	105	0.59	0.66
	11/1/95	91	NA	92	83		
	1/22/96	74.5	25	78	70	0.32	0.36
	1/31/96	52.2	32	57	52	0.56	0.62
	3/5/96	78.6	141	81	73	1.74	1.93
	12/9/96	57	80	71.5	65.3	1.12	1.23
	1/15/97	62	40	75.8	69.2	0.53	0.58

Toxicity to Aquatic Organisms

Stormwater runoff from Chollas Creek (SD8) demonstrated acute toxicity to aquatic test organisms (i.e., Ceriodaphnia). The major cause of toxicity to Ceriodaphnia could be in part due to the the pesticide diazinon (Hansen 1994, WCC 1995). This is an organophosphorous insecticide that is widely used in residential and landscaped areas and is common in stormwater runoff. Stormwater concentrations from 25 to 50% showed impairment of reproduction in Ceriodaphnia although acute toxicity to Ceriodaphnia typically masked chronic toxicity measurements. Fathead minnows showed greater chronic toxicity and storm water concentrations as low as 6.25% impaired growth of larval fathead minnows.

Benthic Community Analysis - Naval Base 07

San Diego Bay at the mouth of Chollas Creek is on the 303(d) list for benthic community degradation and toxicity in the sediment. Sediment from three stations at the mouth of Chollas Creek at its confluence with San Diego Bay were analyzed under the Bay Protection and Toxic Cleanup Program (BPTC) and exhibited degraded benthic communities. This condition supported listing of this area on the 303(d) list and also the designation of this area as a candidate toxic hot spot in the Regional Toxic Hot Spot Cleanup Plan. Although the cause of the benthic community degradation is not known, chlordane is present in elevated concentrations at the three BPTC stations.

Station	ID #	ERM Q 90% confidence interval >0.85	PELQ 90% confidence interval >1.29	Benthic Community Degradation and Toxicity in the Sediment	Amphipod Survival for Solid Phase Test	Date
90006	155			benthic community not sampled	82 +/- 13	10/13/92
90006	865	1.056	1.487	benthic community degraded Chlordane >4x ERM or 5.9 x PEL	92 +/- 8	8/4/93
93170	783			benthic community not sampled	-	
93182	800			benthic community not sampled	67 +/- 26.8	5/26/93
93183	801			benthic community not sampled	57 +/- 25.1	5/26/93
93212	866	0.589	0.847	benthic community degraded Chlordane >4x ERM or 5.9 x PEL	91 +/- 10	8/4/93
93213	867	1.230	1.730	benthic community degraded Cis- Chlordane >4x ERM (24.1); Trans- Chlordane >5.9x PEL and 4x ERM (29.3)	94 +/- 8	8/4/93

Stations 866 and 867
Polychaetes
***Cossura candida
Dorvillea longicornis
**Eranno lagunae
***Leitoscoloplos pugettensis
Mediomastus californiensis
Nepthys cornuta
Odontosyllis phosphorea
Paraprionospio pinnata
***Prionospio heterobranchia
Scoletoma tetaura

Bivalve
Theora fragilis

Amphipoda
Monoculodes hartmanae

Gammaridea
Synchelidium rectipalmum

Sediments

During the 1994-95 stormwater monitoring program sampling, sediment samples were collected from Chollas Creek and in San Diego Bay at the mouth of the creek. Four locations were monitored. Bay stations increased in lead, zinc and PAH concentrations after the rainy season. Bay stations decreased in concentrations of chromium, copper, pesticides and PCBs concentrations after the rainy season.

Metals (mg/kg)	Date	1A/1B	2A/2B	3A/3B	Chollas
Arsenic	5/2/96	2.3	1.9	2.5	<1.0
	9/28/96	2.1	2.28	2.5	1.12
Cadmium	5/2/96	<0.5	<0.5	<0.5	<0.5
	9/28/96	<0.08	<0.08	<0.08	<0.08
Chromium	5/2/96	13.4	11.5	11.6	3.6
	9/28/96	18.8	14.6	15.2	6.42
Copper	5/2/96	32.7	35.7	40.0	3.1
	9/28/96	186	38.6	37.8	3.66
Lead	5/2/96	46.3	36.7	38.2	54.1
	9/28/96	54.5	55.5	36.8	23.2
Zinc	5/2/96	141	102	105	21.6
	9/28/96	137	118	97.2	24.2

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(SDRWQCB, 2001b)