

**CITY OF SANTA BARBARA WATERFRONT DEPARTMENT
MEMORANDUM**

Date: April 16, 2015
To: Harbor Commission
From: Scott Riedman, Waterfront Director
Subject: **Annual Review—Clean Marina Program**

RECOMMENDATION:

That Harbor Commission review and consider an annual report on the Department's Clean Marina Program.

BACKGROUND:

City Council adopted a Clean Marina Program ("Program") in 2002. Its goal is to achieve and maintain, via feasible means and alternatives, best management practices and a clean harbor environment for people, aquatic life and seabirds. The Program includes six elements:

- | | |
|------------------------------|--|
| 1. Facilities for Boaters | 4. Pollution Prevention and Abatement Projects |
| 2. Water Quality | 5. Education |
| 3. Best Management Practices | 6. Compliance and Enforcement |

Staff reports annually on the status of the Program to the Harbor Commission.

DISCUSSION:

1. Facilities for Boaters

A. Sewage Pump-Outs

The harbor's five sewage pump-out stations accommodate boaters and reduce the likelihood of sewage spills. Last year, Waterfront Maintenance staff rebuilt pump-outs at Marina 1 West and Sea Landing. Overall use was similar to FY' 13.

Sewage Pump-Out Use (In Minutes)

<u>Fiscal</u> <u>Year</u>	<u>Marina 1</u> <u>East*</u>	<u>Marina 1</u> <u>West</u>	<u>Fuel</u> <u>Dock</u>	<u>Launch</u> <u>Ramp</u>	<u>Annual</u> <u>Total</u>
FY '03	5,165	1,253	1,421	73	7,912
FY '04	4,957	1,069	1,310	135	7,471
FY '05	4,758	758	2,183	3	7,764
FY '06	4,384	1,657	2,608	362	9,011
FY '07	3,796	1,269	1,666	27	6,785
FY '08	3,834	1,172	2,207	15	7,228
FY '09	3,690	976	1,464	252	6,382

FY '10	3,876	896	1,336	179	6,287
FY '11	4,128	884	1,204	217	6,433
FY '12	3,652	1,807	2,085	198	7,742
FY '13	3,802	336	2,249	437	5,938
FY '14	3,082	417	1,864	224	5,587

* Two stations, P/Q finger and R/S finger

B. Bilge-Water Pump-Out

A bilge-water pump-out at the Fuel Dock is one of five operating in California, with one pending in Oceanside. It accepts bilge water mixed with either oil or diesel, but cannot accept gasoline or “hot loads” with contaminants like soap, which must be disposed of at a Household Hazardous Waste Facility. The pump-out sends oil to a waste-oil container and residual water into the City’s sewer system. The facility removed 4,635 gallons of bilge water in 2014, 93% of its 12-year average.

Bilge-Water Pump-Out Use

<u>Year</u>	<u>Minutes</u>	<u>Gallons</u>
2003	1,086	5,430
2004	1,602	8,010
2005	1,416	7,080
2006	1,353	6,765
2007	1,546	7,730
2008	N/A	N/A
2009	629	3,145
2010	948	4,740
2011	813	4,065
2012	895	4,475
2013	728	3,640
2014	927	4,635

C. Debris Nets

Over 40 debris nets—found on each finger dock—help boaters remove light debris from the harbor. Some nets disappear or rot out each year. In 2014, staff replaced parts equivalent to 10 nets, above average for the past seven years but the same as 2013, commensurate with replacement rates expected as the nets age.

<u>Year</u>	<u>Nets</u>
2008	15
2009	7
2010	8
2011	6
2012	11
2013	10
2014	10

D. Waste-Oil Disposal

The Department operates waste-oil disposal stations at the Fuel Dock, Marina 2 and Marina 4. These free facilities also accept oil filters, anti-freeze and oil-absorbent bilge pads. Staff has tracked the number of gallons of oil received at these stations for the past four years. The FY '14 total was significantly lower than the previous three reporting years, due to reasons not completely understood, including the possibilities of less boat maintenance being performed or an accounting error. Staff will continue to carefully monitor usage of the waste-oil disposal facilities.

<u>Year</u>	<u>Gallons</u>
FY '11	7,585
FY '12	6,675
FY '13	7,145
FY '14	2,500

E. Marine Battery Collection

The Department provides a marine battery collection bin on the City Pier near the Fuel Dock. Interstate Batteries hauls away the batteries for free. The number of batteries recycled in FY '14 was similar to the number recycled in FY'13.

<u>Year</u>	<u>Batteries Recycled</u>
FY '09	450
FY '10	350
FY '11	300
FY '12	290
FY '13	200
FY '14	220

F. Fishing Line Recycling

The Department provides two fishing-line recycling stations—one at Stearns Wharf Bait and Tackle and one on the passenger-carrying fishing vessel *Stardust* at Sea Landing. In 2014, eight pounds of line was deposited at Stearns Wharf, and 25 pounds of line was deposited aboard the *Stardust*. The latter represents the first year operating this receptacle, and a breakthrough in accommodating recycled line that would otherwise likely end up in the ocean.

2. Water Quality

A. Monthly “Dry Season” Harbor Water Quality Monitoring

Seven stations were tested for three bacterial indicators between April and October, 2014. For the third straight year, no samples exceeded state standards for body contact (Attachment 1), though for unknown reasons Station 12, in the Federal Channel west of Stearns Wharf tested unusually high for total coliform in July, 2014. A map of harbor sampling sites is included as Attachment 2.

B. Sewage Spill

On November 13, 2014, maintenance staff was alerted to a sewage leak near the Marina 1 West restroom, which they traced to a cracked elbow in an underwater pipe. Both Marina 1 East and West restroom pumps were immediately shut down and staff alerted all appropriate emergency-response agencies, plus all dive-service companies that operate in the harbor. The faulty plumbing was replaced the same day.

The spill was estimated at 100 gallons. Water-quality tests were conducted the day of the spill, the day after the spill and on November 17, 2014. Test locations are included as Attachment 3 (site “C” was near the spill). Test results are included as Attachment 4. Results indicate that water quality exceeded state limits for body contact for fecal coliform and enterococcus at site “C” on the day of the spill. Results the following day and again on November 17th did not exceed those limits.

C. East Beach Water Quality Monitoring

Coastal Commission permit conditions for the East Beach Mooring Program require twice-yearly water-quality testing in the mooring area for heavy metals and three times a year for bacteria. Results remain consistent with baseline results from 2006, indicating good water quality in the project area (Attachment 5). Sampling sites are noted in Attachment 6. If the area continues to test “clean” for two more years of a 10-year agreement with the Commission, the testing requirement will be waived.

D. Dissolved Oxygen Tests

The Department tests dissolved oxygen (D/O) levels in the harbor to predict and report low-oxygen events that cause fish and invertebrate die-offs. Twelve D/O tests were conducted in latter part of FY '14 and first part of FY '15. Results (Attachment 7) indicate generally good levels (five milligrams of oxygen per liter of water) except, notably, poor levels in October and November, 2014. Lower levels in fall are consistent with results from previous years, possibly reflecting the presence of algal blooms. Though none were visibly detected in the harbor, there were signs of “lazy” baitfish behavior at times last fall, like slow swimming and “side swimming” anchovies.

When D/O levels are dramatically low, the Department posts marina gates so crab and lobster fishermen who store their catch in receivers can move them outside the harbor to avoid “dead loss.” This occurred twice in 2014, in October and November. Fishermen are encouraged to alert the Department immediately if they experience high dead-loss, so staff can test D/O levels.

E. Anti-Fouling Paints (AFPs)

In response to studies indicating elevated copper levels in many Southern

California harbors, the testing of alternative AFPs has increased in recent years. In an effort to advance applied knowledge, the Department has experimented with new AFPs on its Patrol boats since 2009.

Patrol Boat #3: The Department experienced limited success with zinc-based bottom paint on PB #3, its aluminum-hulled, 33' fireboat. Ultimately, however, this paint did not meet durability standards for a patrol boat (flaking and peeling). In 2012 the Department switched to non-metallic biocide paint on PB #3, with similar limited success (peeling and lack of availability). Availability, in turn, was influenced by lack of demand for this product. While the non-metallic biocide paint remains on PB #3, the Department is not inclined to apply similar product to its other two patrol boats due both to its lack of performance and cost for repainting hulls more frequently than desired—especially compared to traditional copper-based paints, which remain on Patrol Boats #1 and #2.

Patrol Boat #2: Over the past several years, the Department has experimented with several non-metallic coatings on its other fireboat, a 32' fiberglass Radon. The boat has had to be repainted every 4 – 6 months, a time-consuming, expensive process that greatly increased its “down time.” Currently, therefore, Patrol Boat #2's hull is painted with a copper-based AFP.

Patrol Boat #1: To date, PB #1 has served as the Department's “control” vessel relative to AFPs tested on PB #2 and PB #3. It remains coated with a copper-based AFP.

Meanwhile, the Department continues to research emergence and availability of efficient, non-copper AFPs for potential use on all its patrol boats and will continue to experiment with new products moving forward.

F. Industry's Clean Marina Program

The Clean Marina Program is a multi-state, industry-sponsored certification program designed to reflect compliance with strict environmental and best-management practices to prevent ocean pollution. The Program has certified 127 California marinas since 2004. Santa Barbara Harbor was certified in July 2006 and recertified in June 2011. It is due again for recertification in 2016.

3. Best Management Practices (BMPs)

A. Storm Water Pollution Prevention Plan

The Department complies with federal Clean Water Act standards through its Stormwater Pollution Prevention Plan (SWPPP), whose goal is to prevent pollution discharges into the harbor. The SWPPP includes a description of the entire Waterfront and potential sources of stormwater discharge, plus BMPs to maintain the area such that stormwater does not become contaminated as it flows off Waterfront property. Visual observations are made quarterly and stormwater runoff samples (mostly from parking lots) are captured by our

consultant, Leidos, Inc., during two storm events per year. Results are reported annually to the RWQCB.

During calendar year 2014, staff reported two illicit discharges noted in the discussion of the Marina 1 sewage spill, plus pollution warnings and citations given to boaters (see Compliance and Enforcement) to the Regional Water Quality Control Board.

B. Storm Water Management Plan

In 2009, the City completed a state-mandated Stormwater Management Plan (SWMP), which includes several Minimum Control Measures (MCMs—like public outreach, illicit Discharge detection and BMPs) to help maintain good water quality in our harbor. As part of the City's overall SWMP, the Waterfront developed MCMs specific to its operations. To date, the Waterfront is compliant and current with the SWMP and will continue to work closely with the RWQCB to modify the document as appropriate.

C. Diver BMPs

All hull-cleaning dive companies are trained and certified in BMPs for minimizing paint sloughing into the harbor. Harbor Patrol Officers are similarly trained.

D. Staff and Contractor BMPs

City staff and City contractors observe BMPs during maintenance, repair and construction work at the Waterfront:

- Vacuuming debris on decks or roadways during work
- Power-washing and/or scrubbing roadways and parking lots for oil and stain removal (recovered and deposited into sewer system)
- Monthly trash-enclosure cleaning at Waterfront Center Building
- Placing booms around projects sites near the water
- Placing crew in skiffs in the water to scoop debris
- Monitoring beaches to ensure all debris is retrieved Removing any leaking equipment from service

E. Oil Absorbent Pad Distribution

Funded by the CalRecycle grant noted earlier, the Department distributes recyclable absorbent bilge pads that boaters use to soak up oily bilges and prevent leaks while fueling. The number of pads distributed in FY '14 is the same as FY'13 and near the 12-year average, during which time nearly 190,000 pads have been distributed.

<u>Year</u>	<u>Pads Distributed</u>
FY '03	15,000
FY '04	18,000

FY '05	20,000
FY '06	17,000
FY '07	14,400
FY '08	14,000
FY '09	17,500
FY '10	17,500
FY '11	21,000
FY '12	17,000
FY '13	15,000
FY '14	15,000

F. Bird Protection

Four years ago, the Department began tracking bird rescues, activity it coordinates with the Wildlife Care Network. The “spike” in rescues in FY '13 tapered off to 38 in 2014.

<u>Year</u>	<u>Bird Rescues</u>
FY '11	29
FY '12	81
FY '13	115
FY '14	38

4. Pollution Prevention and Abatement Projects

A. “Salad Boat”

Augmenting maintenance staff’s routine efforts, a contractor working from the dock and/or a 13’ skiff, extracts litter and debris from the harbor on alternate Saturdays and following harbor events or storms. This improves the harbor’s appearance, encourages a clean-ocean environment and helps maintain access to and from boat slips.

In March, 2014, high tides and a very large west swell deposited tons of kelp into Santa Barbara Harbor. The kelp land-locked many boats in their slips and the salad-boat cleanup required 187 hours of labor costing \$24,971. This single event drove annual Clean Marina Program costs far beyond their normal level.

During dry weather, Area “C” near the small-boat launch ramp was the number one “hot spot” for debris last year, followed by Area “G,” especially west-facing docks in Marina One. Following storms, Areas “A” and “B,” located near storm drains on the north side of the harbor become important collection areas. Debris typically includes aluminum cans, newspaper, buckets, kelp, plastic bags, tennis balls, rope, bamboo, tree limbs, cigarettes, snack wrappers and Styrofoam cups.

B. Abandoned Watercraft Abatement and Vessel Turn-In Grants

The Department is currently working with a DBW-funded \$10,000 Abandoned Watercraft Abatement Fund grant, used to remove abandoned boats when their owners default on their obligation to do so. The Department removed 3 abandoned boats in FY '14 (though it has already removed six in FY '15).

<u>Year</u>	<u>Abandoned Boats</u>
FY '06	14
FY '07	10
FY '08	13
FY '09	6
FY '10	15
FY '11	10
FY '12	2
FY '13	3
FY '14	3

The City also participates in DBW's five-year-old Vessel Turn-In Program (VTIP), which allows voluntary surrender of vessels that would potentially be abandoned (and likely end up in the East Beach anchorage). Operating with a DBW-funded \$8,800 grant good until October, 2016, following is the Department's four-year record of disposed VTIP vessels:

<u>Year</u>	<u>VTIP Boats</u>
FY '11	10
FY '12	2
FY '13	1
FY '14	9

C. Operation Clean Sweep

Operation Clean Sweep, a volunteer seafloor cleanup program, has removed 15.7 tons of debris from the harbor during eight annual one-day events. Typical debris includes barbecues, bicycles, plastic barrels, boat propellers, outboard engines and an occasional marine battery. This year's event (May 2nd) will target Marina 1 "Q," "R" and "S" fingers, completing Clean Sweep's first harbor "circumnavigation," to begin again in Marina 4 in 2016.

5. Education

Staff disseminates Clean Marina information via *Docklines* and *The Log* newspaper, as well as other local media outlets and, recently, *Marina and Dock Age* magazine. It also distributes literature from California Sea Grant, the California Coastal Commission, DBW and the U.S. Coast Guard. Recent Clean-Marina *Docklines* articles included a preview of Operation Clean Sweep, the Department's seafloor debris cleanup event and its Hazmat Turn-In day—both scheduled for May, 2015. Harbor Patrol educates boaters in the field, distributing pollution packets describing BMPs for clean boating and environmentally sound boat maintenance.

On April 8, 2015, the Harbor Operations Manager, made a presentation about educational and outreach aspects of the Department's Clean Marina Program at a Used-Oil/Household and Hazardous Waste Conference Session - Oil and Water Don't Mix, sponsored by Cal Recycle, which funds many of our pollution-prevention and waste-oil disposal programs.

6. Compliance and Enforcement

A. Marine Sanitation Device (MSD) Inspections

Dye-tabling MSDs ("holding tanks") is required for boats visiting Santa Barbara Harbor and for new slip and live-aboard assignments. The number of MSD inspections in FY '14 (704) was up slightly over FY '13, possibly reflecting increased visitor berthing, due to a non-active year in the Marina 1 reconstruction project.

<u>Year</u>	<u>MSD Inspections</u>
FY '03	1,230
FY '04	1,280
FY '05	1,199
FY '06	1,259
FY '07	1,370
FY '08	1,160
FY '09	992
FY '10	837
FY '11	770
FY '12	640
FY '13	666
FY '14	704

B. Discharge Violations

There were seven known pollution violations in FY '14, the lowest number in 10 years and the latest in a steady downward trend. For the first time, as well, Patrol issued no citations. The ratio of warnings to citations continues to reflect the Department's emphasis on education as its primary enforcement tool, as well as boaters' general compliance with pollution-prevention laws.

<u>Year</u>	<u>Total</u>	<u>Warnings</u>	<u>Cites</u>
FY '05	32	29	3
FY '06	19	16	3
FY '07	22	19	3
FY '08	22	18	4
FY '09	14	13	1
FY '10	19	16	3
FY '11	14	12	2
FY '12	10	8	2
FY '13	9	7	2
FY '14	7	7	0

COST SUMMARY:

Storm Water Pollution Prevention Plan	\$12,250
Dry Season Water Quality Testing	\$2,370
Salad Boat	\$34,600
* Oil-Absorbent Pads	\$4,400
* Abandoned Vessel Disposal	\$8,300
East Beach Water Quality Testing	\$7,790
Replace Dockside Debris Nets	\$1,300
* Hazmat Turn-In Disposal	\$9,500
* Used-Oil Disposal	\$10,600
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Total Annualized Program Cost:	\$91,110
* Grant Funded/Reimbursed Costs:	<u>-\$32,800</u>
FY '14 Adjusted Clean Marina Program Cost:	\$58,310

ANNUAL CLEAN MARINA PROGRAM COSTS:

FY 2003	\$40,647
FY 2004	\$25,476
FY 2005	\$27,627
FY 2006	\$32,400
FY 2007	\$33,770
FY 2008	\$25,900
FY 2009	\$25,163
FY 2010	\$21,792
FY 2011	\$21,543
FY 2012	\$35,140
FY 2013	\$38,018
FY 2014	\$58,310**

** Though FY 2014 Clean Marina Program costs were nearly double the average during the Program's 12-year history, they were driven up by the one-time, \$25,000 Salad Boat expense for harbor clean-up after the storm and swell event in March, 2014. Backing out that number, FY '14 costs were \$33,310, similar to Program costs in FY '13 and FY '12.

CONCLUSION:

The Clean Marina Program continues to be an important contribution to the Department's overall mission, with annual costs remaining stable. The Program highlights the importance of maintaining a clean ocean environment for those who visit, recreate or work in Santa Barbara Harbor, as well as the marine and avian life that depend on it to thrive.

- Attachments:
1. Water Quality Sampling Results—Harbor
 2. Water Quality Sampling Map—Harbor
 3. Water Quality Sampling Map—Nov, 2014 Marina-1 sewage spill
 4. Water Quality Sampling Results— Nov, 2014 Marina-1 sewage spill
 5. East Beach Mooring Area Water Quality Test Results—2014
 6. East Beach Mooring Area Water Quality Sampling Map
 7. Dissolved Oxygen Sampling Results—Harbor
 8. Salad Boat Annual Report
 9. Salad Boat Debris Cleanup Map

Prepared by: Mick Kronman, Harbor Operations Manager

**SANTA BARBARA HARBOR
WATER QUALITY TEST RESULTS
2014**

Total Coliform MPN/100mls							
Station	May	June	July	August	September	October	
SBH #7	20	52	98	41	110	74	
SBH #8	145	74	1017	189	135	269	
SBH #9	41	173	175	109	354	NA	
SBH #10	20	51	253	97	243	41	
SBH #11	256	86	341	86	199	86	
SBH #12	31	<10	4611	74	10	288	
SBH #13	<10	<10	<10	<10	<10	<10	
Limit: <10,000 MPN/100mls							

Fecal Coliform MPN/100mls							
Station	May	June	July	August	September	October	
SBH #7	<10	<10	<10	20	10	10	
SBH #8	<10	10	504	10	<10	20	
SBH #9	<10	<10	<10	<10	<10	NA	
SBH #10	<10	10	31	31	10	<10	
SBH #11	<10	10	98	<10	63	10	
SBH #12	<10	<10	399	31	<10	41	
SBH #13	<10	<10	<10	<10	<10	<10	
Limit: < 400 MPN/100mls							

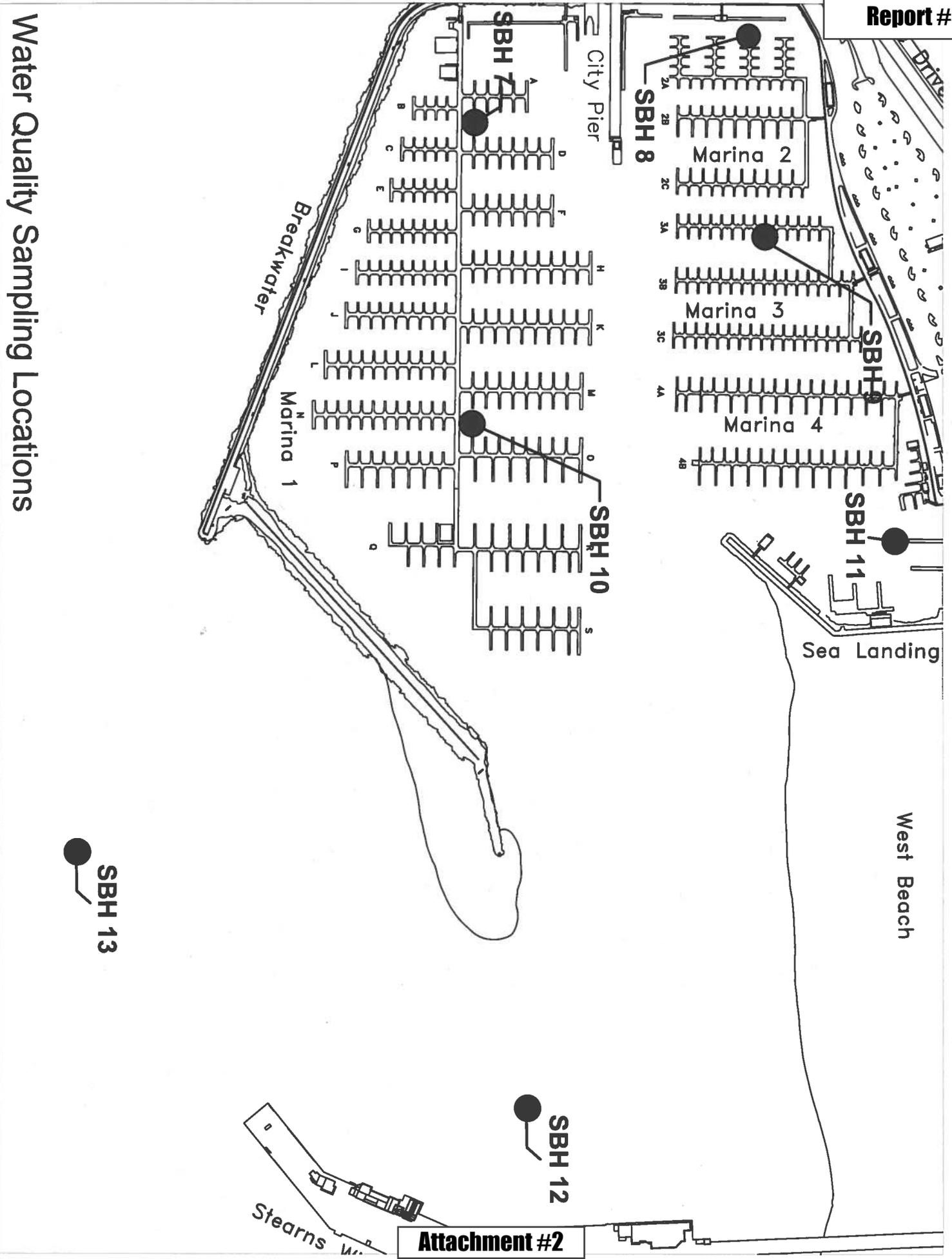
Enterococcus MPN/100mls							
Station	May	June	July	August	September	October	
SBH #7	<10	<10	<10	10	<10	<10	
SBH #8	<10	<10	<10	<10	<10	31	
SBH #9	<10	<10	10	20	<10	NA	
SBH #10	<10	10	<10	20	<10	<10	
SBH #11	<10	<10	<10	<10	10	<10	
SBH #12	<10	<10	10	<10	<10	<10	
SBH #13	<10	<10	10	10	<10	<10	
Limit: < 104 MPN/100mls							

SANTA BARBARA HARBOR
WATER QUALITY TEST RESULTS
2014

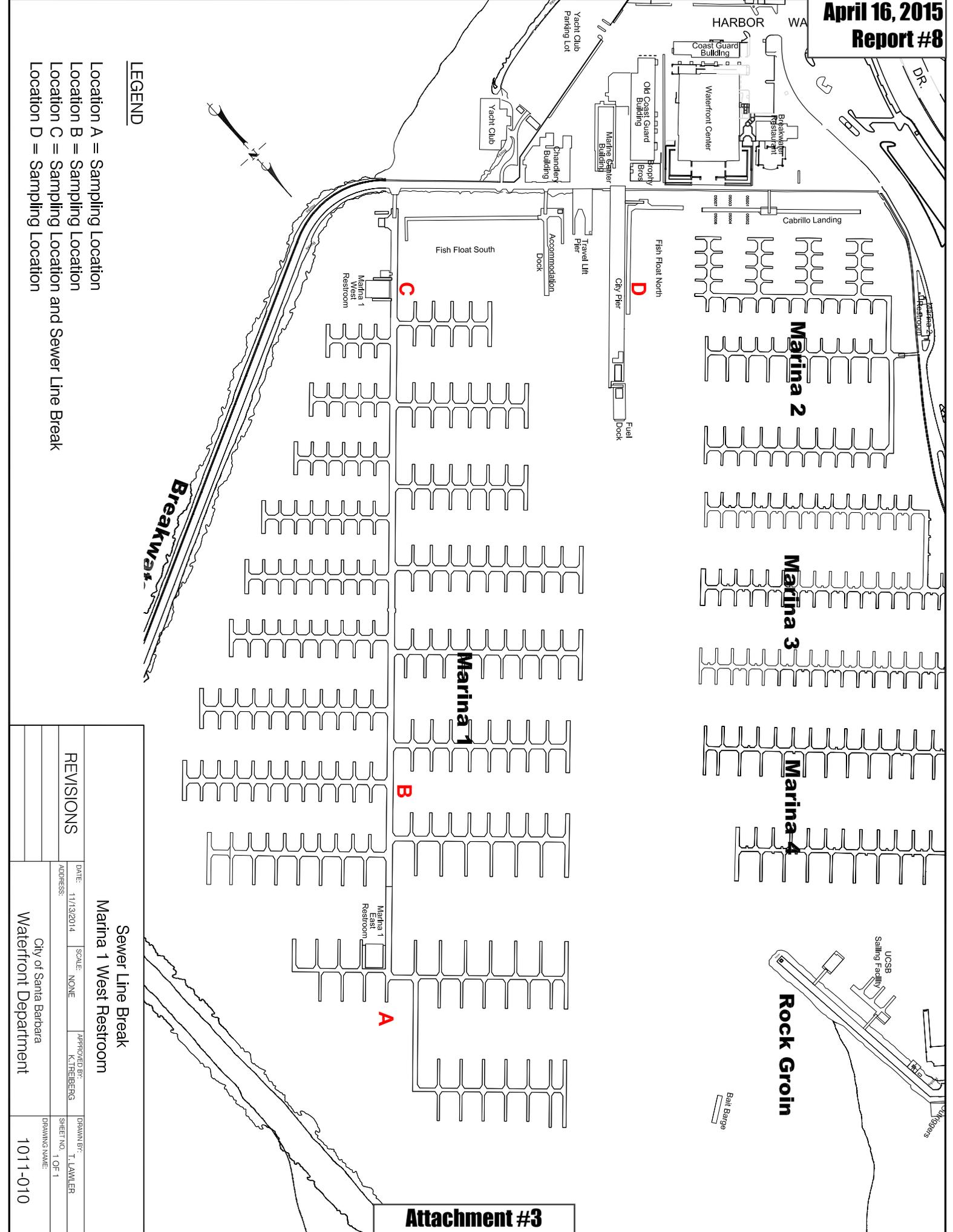
April 16, 2015
Report #8

MBAS MPN/l			
Station	April	June	August
SBH #7	ND	ND	ND
SBH #8	ND	ND	ND
SBH #9	ND	ND	ND
SBH #10	ND	ND	ND
SBH #11	ND	ND	ND
SBH #12	ND	ND	ND
SBH #13	ND	ND	ND
Limit: < .2 MPN mg/l			

Attachment #1



Water Quality Sampling Locations



LEGEND

- Location A = Sampling Location
- Location B = Sampling Location
- Location C = Sampling Location and Sewer Line Break
- Location D = Sampling Location

Sewer Line Break	
Marina 1 West Restroom	
REVISIONS	
DATE: 11/13/2014	SCALE: NONE
ADDRESS: City of Santa Barbara	APPROVED BY: K. THEIBERG
Waterfront Department	DRAWN BY: T. LAWLER
	SHEET NO. 1 OF 1
	DRAWING NAME: 1011-010

SANTA BARBARA HARBOR
WATER QUALITY TEST RESULTS
MARINA 1 SEWER SPILL

Total Coliform MPN/100mls			
Station	November 13	November 14	November 17
Location A	97	529	85
Location B	41	479	135
Location C	1607	85	10
Location D	41	145	1076
Limit: <10,000 MPN/100mls			

Fecal Coliform MPN/100mls			
Station	November 13	November 14	November 17
Location A	41	435	52
Location B	31	10	31
Location C	487	10	10
Location D	<10	41	41
Limit: < 400 MPN/100mls			

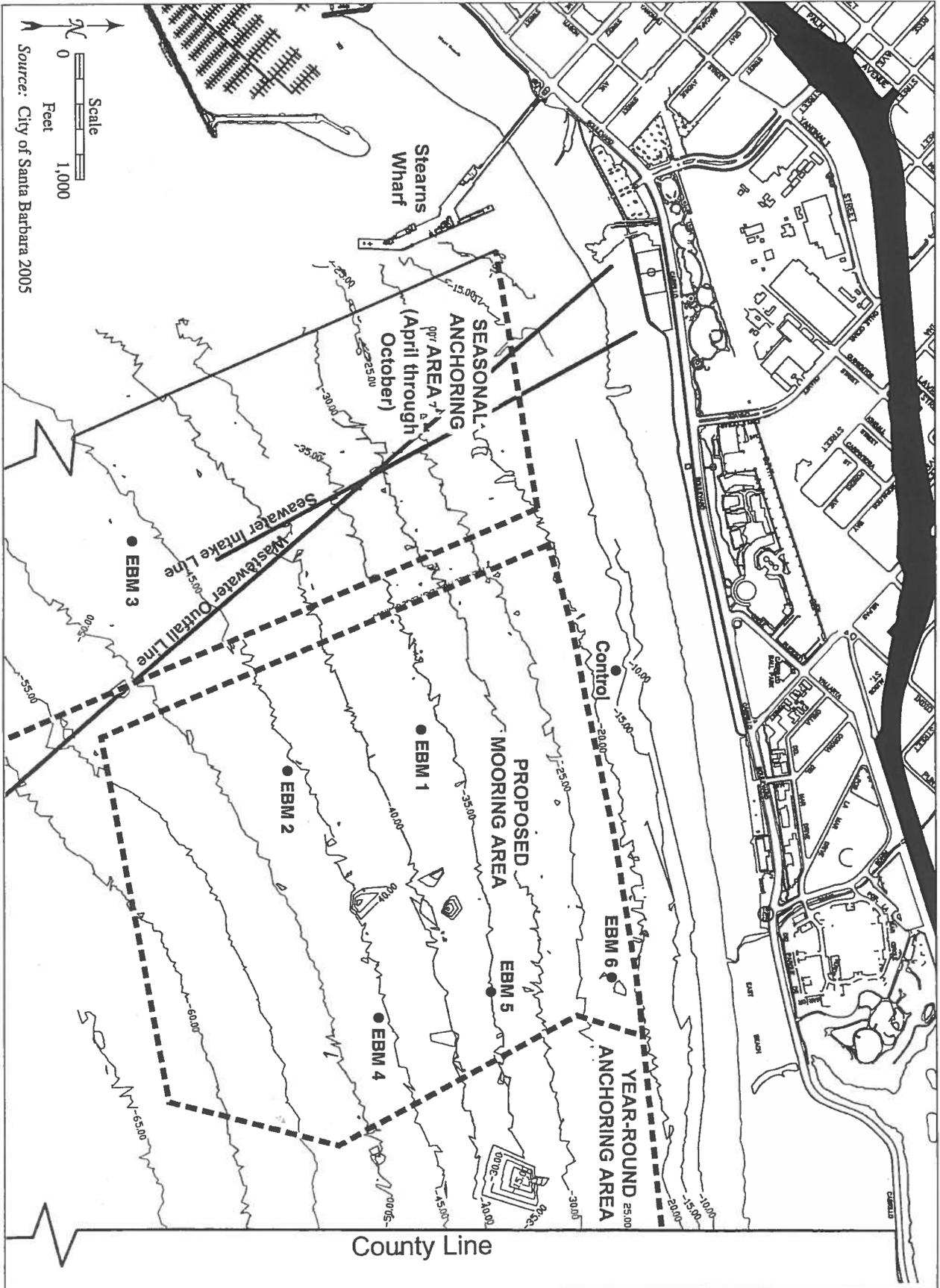
Enterococcus MPN/100mls			
Station	November 13	November 14	November 17
Location A	10	410	10
Location B	<10	<1	<10
Location C	253	<1	10
Location D	<10	<1	10
Limit: < 104 MPN/100mls			

**EAST BEACH MOORING
WATER QUALITY TEST RESULTS
2014**

Total Coliform MPN/100ml			
Station	July	August	September
EBM #1	<10	<10	<10
EBM #2	<10	<10	<10
EBM #3	<10	<10	<10
EBM #4	<10	<10	<10
EBM #5	<10	<10	<10
EBM #6	<10	<10	<10
CONTROL	<10	<10	<10
Limit:	< 10,000 MPN/100 ml		

Fecal Coliform MPN/100ml			
Station	July	August	September
EBM #1	<10	<10	<10
EBM #2	<10	<10	<10
EBM #3	<10	<10	<10
EBM #4	<10	<10	<10
EBM #5	<10	<10	<10
EBM #6	<10	<10	<10
CONTROL	<10	<10	<10
Limit:	< 400 MPN/100ml		

Enterococcus MPN/100ml			
Station	July	August	September
EBM #1	<10	<10	<10
EBM #2	<10	<10	<10
EBM #3	<10	<10	<10
EBM #4	<10	<10	<10
EBM #5	<10	<10	<10
EBM #6	<10	<10	<10
CONTROL	10	<10	<10
Limit:	< 104 MPN/100ml		



Map 1. Proposed Mooring and Anchoring Areas

Dissolved Oxygen Levels in the Harbor

4/30/2014

		<i>Near Surface DO</i>	<i>Near Bottom DO</i>
Station #7	Marina 1A002	5.05 mg/l	4.47 mg/l
Station #8	Marina 2B300	5.62 mg/l	4.43 mg/l
Station #9	Marina 3A030	4.97 mg/l	4.91 mg/l
Station #10	Marina 1M001	5.12 mg/l	4.88 mg/l
Station #11	West Finger of Launch Ramp	5.05 mg/l	4.92 mg/l
Station #12	Red Bouy #10, Mouth of Harbor	5.91 mg/l	5.86 mg/l
Station #13	Control, 100 yards Offshore	6.27 mg/l	6.46 mg/l

6/25/2014

		<i>Near Surface DO</i>	<i>Near Bottom DO</i>
Station #7	Marina 1A002	6.42 mg/l	7.36 mg/l
Station #8	Marina 2B300	6.66 mg/l	5.25 mg/l
Station #9	Marina 3A030	6.48 mg/l	6.38 mg/l
Station #10	Marina 1M001	7.55 mg/l	6.05 mg/l
Station #11	West Finger of Launch Ramp	6.72 mg/l	6.08 mg/l
Station #12	Red Bouy #10, Mouth of Harbor	7.17 mg/l	7.45 mg/l
Station #13	Control, 100 yards Offshore	8.43 mg/l	8.46 mg/l

7/22/2014

		<i>Near Surface DO</i>	<i>Near Bottom DO</i>
Station #7	Marina 1A002	5.66 mg/l	6.11 mg/l
Station #8	Marina 2B300	6.20 mg/l	5.60 mg/l
Station #9	Marina 3A030	6.21 mg/l	6.65 mg/l
Station #10	Marina 1M001	6.75 mg/l	6.31 mg/l
Station #11	West Finger of Launch Ramp	5.06 mg/l	5.06 mg/l
Station #12	Red Bouy #10, Mouth of Harbor	7.91 mg/l	8.36 mg/l
Station #13	Control, 100 yards Offshore	8.00 mg/l	7.97 mg/l

7/30/2014

		<i>Near Surface DO</i>	<i>Near Bottom DO</i>
Station #7	Marina 1A002	4.65 mg/l	6.32 mg/l
Station #8	Marina 2B300	6.45 mg/l	5.76 mg/l
Station #9	Marina 3A030	6.99 mg/l	6.77 mg/l
Station #10	Marina 1M001	5.28 mg/l	6.16 mg/l
Station #11	West Finger of Launch Ramp	6.03 mg/l	5.03 mg/l
Station #12	Red Bouy #10, Mouth of Harbor	7.53 mg/l	7.63 mg/l
Station #13	Control, 100 yards Offshore	7.78 mg/l	7.55 mg/l

9/23/2014

		<i>Near Surface DO</i>	<i>Near Bottom DO</i>
Station #7	Marina 1A002	3.05 mg/l	4.70 mg/l
Station #8	Marina 2B300	4.50 mg/l	4.33 mg/l
Station #9	Marina 3A030	5.06 mg/l	3.81 mg/l
Station #10	Marina 1M001	4.70 mg/l	5.40 mg/l
Station #11	West Finger of Launch Ramp	4.46 mg/l	4.25 mg/l
Station #12	Red Bouy #10, Mouth of Harbor	6.08 mg/l	7.38 mg/l
Station #13	Control, 100 yards Offshore	7.52 mg/l	7.66 mg/l

9/30/2014

		<i>Near Surface DO</i>	<i>Near Bottom DO</i>
Station #7	Marina 1A002	5.67 mg/l	5.39 mg/l
Station #8	Marina 2B300	5.01 mg/l	4.05 mg/l
Station #9	Marina 3A030	5.38 mg/l	4.36 mg/l
Station #10	Marina 1M001	5.59 mg/l	4.65 mg/l
Station #11	West Finger of Launch Ramp	5.26 mg/l	5.40 mg/l
Station #12	Red Bouy #10, Mouth of Harbor	6.29 mg/l	6.57 mg/l
Station #13	Control, 100 yards Offshore	7.71 mg/l	7.90 mg/l

Dissolved Oxygen Levels in the Harbor

10/28/2014

		<i>Near Surface DO</i>	<i>Near Bottom DO</i>
Station #7	Marina 1A002	4.64 mg/l	4.78 mg/l
Station #8	Marina 2B300	4.12 mg/l	4.02 mg/l
Station #9	Marina 3A030	4.93 mg/l	5.07 mg/l
Station #10	Marina 1M001	4.85 mg/l	4.77 mg/l
Station #11	West Finger of Launch Ramp	4.14 mg/l	3.64 mg/l
Station #12	Red Bouy #10, Mouth of Harbor	6.15 mg/l	6.44 mg/l
Station #13	Control, 100 yards Offshore	6.84 mg/l	6.92 mg/l

11/11/2014

		<i>Near Surface DO</i>	<i>Near Bottom DO</i>
Station #7	Marina 1A002	4.05 mg/l	3.98 mg/l
Station #8	Marina 2B300	3.63 mg/l	3.28 mg/l
Station #9	Marina 3A030	3.74 mg/l	4.02 mg/l
Station #10	Marina 1M001	3.99 mg/l	4.22 mg/l
Station #11	West Finger of Launch Ramp	3.23 mg/l	3.47 mg/l
Station #12	Red Bouy #10, Mouth of Harbor	6.26 mg/l	6.90 mg/l
Station #13	Control, 100 yards Offshore	7.20 mg/l	7.13 mg/l

1/21/2015

		<i>Near Surface DO</i>	<i>Near Bottom DO</i>
Station #7	Marina 1A002	5.40 mg/l	4.90 mg/l
Station #8	Marina 2B300	4.96 mg/l	5.25 mg/l
Station #9	Marina 3A030	5.12 mg/l	5.90 mg/l
Station #10	Marina 1M001	5.45 mg/l	6.37 mg/l
Station #11	West Finger of Launch Ramp	4.74 mg/l	4.88 mg/l
Station #12	Red Bouy #10, Mouth of Harbor	7.47 mg/l	7.28 mg/l
Station #13	Control, 100 yards Offshore	7.58 mg/l	7.59 mg/l

1/29/2015

		<i>Near Surface DO</i>	<i>Near Bottom DO</i>
Station #7	Marina 1A002	5.50 mg/l	5.16 mg/l
Station #8	Marina 2B300	4.70 mg/l	4.80 mg/l
Station #9	Marina 3A030	5.17 mg/l	4.73 mg/l
Station #10	Marina 1M001	5.56 mg/l	5.89 mg/l
Station #11	West Finger of Launch Ramp	4.92 mg/l	4.67 mg/l
Station #12	Red Bouy #10, Mouth of Harbor	6.78 mg/l	6.82 mg/l
Station #13	Control, 100 yards Offshore	7.34 mg/l	7.37 mg/l

2/26/2015

		<i>Near Surface DO</i>	<i>Near Bottom DO</i>
Station #7	Marina 1A002	4.77 mg/l	5.50 mg/l
Station #8	Marina 2B300	4.78 mg/l	4.94 mg/l
Station #9	Marina 3A030	5.10 mg/l	5.37 mg/l
Station #10	Marina 1M001	6.35 mg/l	6.09 mg/l
Station #11	West Finger of Launch Ramp	5.45 mg/l	5.64 mg/l
Station #12	Red Bouy #10, Mouth of Harbor	6.69 mg/l	7.05 mg/l
Station #13	Control, 100 yards Offshore	7.83 mg/l	7.98 mg/l

3/12/2015

		<i>Near Surface DO</i>	<i>Near Bottom DO</i>
Station #7	Marina 1A002	5.02 mg/l	5.96 mg/l
Station #8	Marina 2B300	4.95 mg/l	4.64 mg/l
Station #9	Marina 3A030	5.77 mg/l	6.05 mg/l
Station #10	Marina 1M001	5.66 mg/l	5.60 mg/l
Station #11	West Finger of Launch Ramp	5.43 mg/l	5.35 mg/l
Station #12	Red Bouy #10, Mouth of Harbor	7.12 mg/l	7.45 mg/l
Station #13	Control, 100 yards Offshore	8.09 mg/l	8.07 mg/l

CUSHMAN CONTRACTING CORPORATION
P.O. Box 147
Goleta, CA 93116-0147

Subject: Harbor Debris Cleanup Summary; July, 2014-March, 2015
Date: March 16, 2015

So far this year, no extraordinary events or additional effort has been required beyond the set maintenance schedule.

During the course of our Harbor Debris cleanup efforts much regularity has been noticed.

Most west-facing docks and fingers are the primary collecting spots for debris. The reason this side collects more debris is most likely due to the direction in which debris are moving. The wind, along with the out-to-sea current at low tide is in an easterly direction. This results in a "comb like" effect, trapping the debris in these areas.

Area "C" has been the area where we pick up the most trash on a bi-weekly basis followed by Area "G" on the west fingers; every time we show up these areas are always dirty.

Area "C" is in the vicinity of the boat launch. The main collection point in this area is along the east side of the harbor along the rock jetty. This is most likely due to the same easterly moving debris direction described above. This area sometimes requires cleanup by skiff or some small vessel; although we mainly get the rock area by foot. The trash usually stays right by the drain located in the rocks.

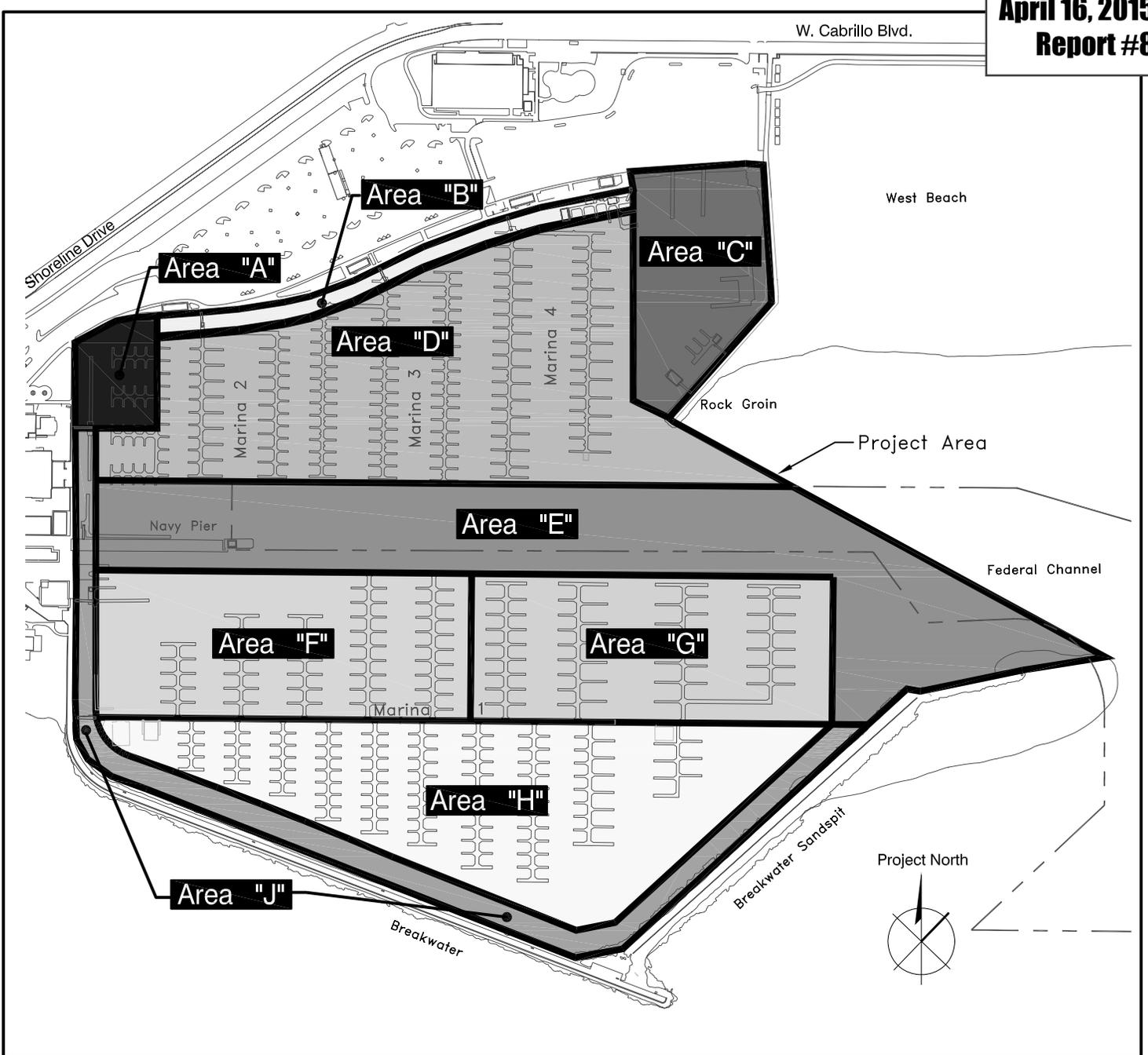
Area "H" usually only has a small amount of trash; but after a storm there is always a good amount of trash. We use a skiff on a regular basis in this area. Because there are more areas for trash and debris to collect in at these areas "G" and "H", this is where our main effort has been concentrated.

A second collection area for debris is in the areas of the Harbor designated as "A" and "B" on the maintenance map. Area "A" is in the vicinity of the storm drain outfall in the northwest corner of the harbor closest to Shoreline Drive. Area "B" is all along the north side of the harbor in the rocks below the seawall in Marinas 2, 3 & 4. For cleanup, a skiff or some small vessel is the only way to reach these areas. These areas are monitored at least once a month and always after holidays. The majority of trash when picked up in this area is after a storm; otherwise it is usually one of the cleanest areas in the harbor.

The debris collected that can be categorized as regular or re-occurring consist of; newspapers, cigarettes, plastic bottles and buckets, bags, styrofoam, candy and food wrappers, aluminum cans, tennis balls, rope, kelp, dead birds, big limbs, and bamboo. Small plastics (water bottle caps, candy and food wrappers) are the most prevalent items found this year.

We have found that walking along the marinas and docks is more time efficient, covers a larger area and produces a much higher volume of debris than working from a skiff. A skiff is used in areas inaccessible by foot, for removal of larger debris and where it is more efficient.

There appears to be slightly fewer dead birds this year than last year. Only 13 birds have been found to date. Last year over 20 birds were found by this time.



Cleanup Date: _____ Operator: _____

Cleanup Hours: _____

Debris Profile:

<input checked="" type="checkbox"/>	Area "A"
<input type="checkbox"/>	Area "B"
<input type="checkbox"/>	Area "C"
<input type="checkbox"/>	Area "D"
<input type="checkbox"/>	Area "E"
<input type="checkbox"/>	Area "F"
<input type="checkbox"/>	Area "G"
<input type="checkbox"/>	Area "H"
<input type="checkbox"/>	Area "J"

General Comments: