

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION**

TECHNICAL ANALYSIS

**Proposed Administrative Civil Liability
Contained in Complaint No. R9-2012-0036
City of Oceanside
Haymar Road Gravity Sewer Spill to Buena Vista Creek, Buena Vista Lagoon
and the Pacific Ocean, San Diego County**

**Noncompliance with
State Water Resources Control Board Order No. 2006-0003-DWQ,
Statewide General Waste Discharge Requirements for Sanitary Sewer Systems
and San Diego Water Board Order No. R9-2007-0005, *Waste Discharge
Requirements for Sewage Collection Agencies in the San Diego Region.***

February 22, 2012

By

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Compliance Assurance Unit**

A. INTRODUCTION

This technical analysis provides a summary of factual and analytical evidence that support the findings in Complaint No. R9-2012-0036 to support an administrative assessment of civil liability in the amount of **\$1,572,850** against the City of Oceanside (hereafter the City) for violations of State Water Board Order No. 2006-0003-DWQ, *Statewide General Waste Discharge Requirements for Sanitary Sewer Systems* and San Diego Water Board Order No. R9-2007-0005, *Waste Discharge Requirements for Sewage Collection Systems in the San Diego Region*.

The City owns and operates approximately 490 miles of sewer pipe, 34 sewer lift stations, and two sewage treatment plants, providing wastewater treatment services to 180,000 residents and businesses within the City. The 15-inch Haymar sewer trunk line is an approximately 50 year old vitrified clay pipe gravity sewer line that conveys untreated sewage from the southeastern portions of the City to the Buena Vista lift station and ultimately the San Luis Rey Wastewater Treatment Plant.

The complaint was issued because the City discharged approximately 5.35 million gallons of raw sewage into Buena Vista Creek, Buena Vista Lagoon and the Pacific Ocean from December 23 – 28, 2010. The sewage spill was a result of the failure of the 15-inch Haymar gravity sewer line. None of the discharged sewage was recovered.

As detailed further in this technical analysis, impacts to beneficial uses from the spill are reasonably expected, with minor harm to beneficial uses. Three months after the spill, consultants for the City conducted an analysis that suggested long term environmental impacts from the spill were unlikely. Evidence of the spill's short term impacts on the beneficial uses is not available. However, the magnitude of the spill would have resulted in beach closures had the City known the spill was occurring. Moreover, a discharge of this magnitude likely produced localized short term impacts to the biota of the creek and lagoon that came into contact with the sewage.

Although the City knew as early as 2006 that the Haymar line had become exposed and posed a serious risk of spilling sewage if damaged, the City made a reasonable effort to implement a solution. However, the City was unable to demonstrate that its effort was entirely commensurate with the increased risk identified in early 2010. Therefore, as described further in this technical analysis, the recommended liability weighs culpability slightly in favor of the City.

B. NATURE, CIRCUMSTANCES, EXTENT AND GRAVITY OF VIOLATIONS

California Water Code section 13385(e) requires the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) to consider several factors when determining the amount of civil liability to impose. These factors include: "...the nature, circumstances, extent and gravity of the violation, and with respect to the violator, the ability to pay, and prior history of violation, the degree of culpability, economic benefit or savings, if any, resulting from the violation, and other matters as justice may require."

Overview of Discharge Area

The Haymar gravity sewer pipe break and raw sewage discharge occurred within the 134-acre Buena Vista Creek Ecological Reserve located south of State Route 78 between College Boulevard and El Camino Real in the City of Carlsbad. Buena Vista Creek runs through the property (see Figure 1). The Reserve supports a number of habitat types, including southern riparian forest, coastal sage scrub, native and non-native grassland and fallow agricultural land. It supports sensitive plant and animal species, including the California Gnatcatcher, Least Bell's Vireo and Thread-leaved Brodiaea. CDF&G acquired the property in March 2007. The Center for Natural Lands Management holds an endowment and manages the property for CDF&G.

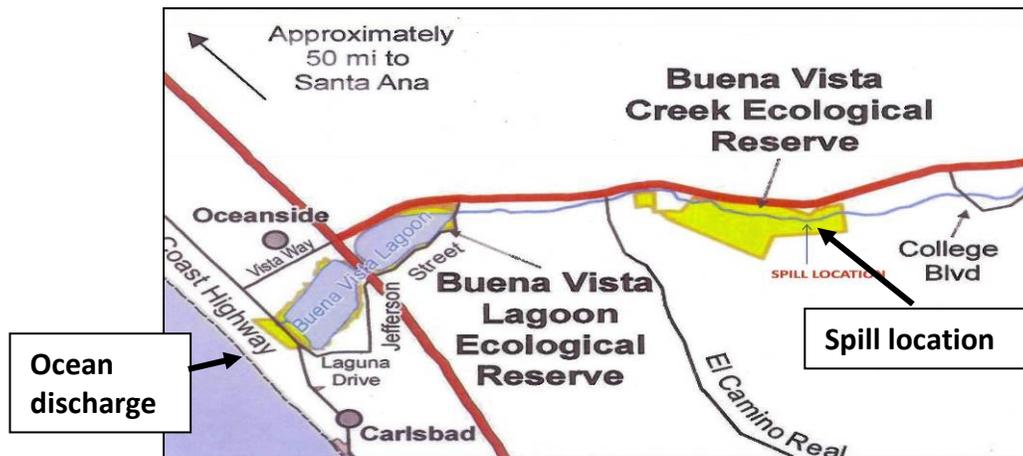


Figure 1. Spill vicinity and location map

The sewage discharge flowed downstream for approximately 1.5 miles and entered the Buena Vista Lagoon Ecological Reserve, also owned and managed by CDF&G, and the Pacific Ocean.

Haymar Sewer Line History

The Haymar sewage line became exposed within the channel of Buena Vista Creek due to the erosion and shifting of the channel. In June 2006, during a routine sewer inspection, City staff found a section of the Haymar gravity sewer line exposed and unsupported within the channel of Buena Vista Creek. The City began planning for the eventual relocation of the sewer line out of the creek channel. As an interim solution to the problem in August 2006 the City slip lined the exposed section of pipe with a cast in place resin impregnated felt liner. The City began working to obtain the necessary permits to relocate the pipeline from within the creek to an existing service road.

Obtaining easements from CDF&G for the proposed realignment project was the single greatest impediment to addressing the risk of the exposed line. In March 2007 CDF&G became owners of the property, which then became the 134-acre Buena Vista Creek Ecological Reserve. The City provided a draft easement for CDF&G's approval in June 2007 that was not accepted because the City had not provided a CEQA analysis. In November 2007 the City began preparing the necessary CEQA documents for the project in anticipation of the receipt of the approved easements.

In March 2009 the City submitted draft easement language to CDF&G which did not address CDF&G's previously-stated position that the City must be responsible for effects caused by the abandoned-in-place pipeline after realignment had taken place. The City's counter position necessitated CDF&G to seek assistance from real-estate experts within the Wildlife Conservation Board to for the easement negotiations.

Initially, the City was reluctant to completely remove the pipe and manholes from the creek bed and felt that abandoning the pipe in place was a less impactful and less expensive solution. CDF&G, however, was concerned about potential adverse effects and resulting liability issues with the pipe remaining in the creek. Eventually, the final easement gave the City the choice of completely removing the pipe or leaving it in place and retaining responsibility for any liability or impacts to the creek that resulted.

In April 2010, concurrent with the easement negotiations, the City discovered that a second section of pipe approximately 75 feet downstream from the original pipe section had also become exposed. By this time, the pipe had become undermined and unsupported in two sections (see Figures 2 & 3). Still lacking easements for the relocation project, the City again looked for an interim fix for the problem.

In August 2010, the City had a site meeting with its engineering and environmental consultants to evaluate options for stabilizing the second undermined pipe section. The City had the consultants review two options: 1) concrete encasement of the pipes, and 2) lining the downstream pipe section.



Figure 2. Upstream exposed section 2010



Figure 3. Downstream exposed section 2010

Both consultants concluded the lining option was the most feasible alternative, but strongly suggested that the final realignment project should be undertaken immediately under an emergency basis because the interim measures the City were proposing could not guarantee the structural integrity of the pipes during the rainy season. The City opted to proceed with lining the second portion of exposed sewer line, obtaining permits from CDF&G and the City of Carlsbad for the interim project.

At some point in July 2010, the City of Oceanside made a single, cursory contact with the Army Corps of Engineers (ACOE) regarding the possibility of obtaining an emergency permit for the realignment project. The ACOE informed the City that since the pipe was still intact, and the City had not declared the situation an emergency, it they did not meet the terms for issuance of Regional General Permit 63 (RGP 63) for emergency situations. Despite its consultants' warnings, the City did not choose to elevate concerns about the pipe past the staff level with the ACOE. It instead continued to work with the ACOE on obtaining permits for the original realignment project.

In October 2010 the City finally obtained easements for the realignment project from CDF&G. The City scheduled the interim lining project for January of 2011.

Based on the evidence provided to the prosecution team, the delays in completing the permitting for the realignment were a result of the complexity of the easement transaction, disagreements over potential easement language, numerous regulatory agency requirements, and reduced CDF&G staff resources due to furloughs imposed by the Governor. The City's culpability for the discharge is slightly reduced to account for these factors in section D.4.a.

The City had designed a realignment project to replace the exposed 420 feet of pipe with an alternate alignment within a service road adjacent to the creek. To accomplish this project the City needed to acquire easements from CDF&G. As documented in the introduction of this analysis the City encountered unanticipated delays in getting the required easements and slip-lined the downstream exposed section of pipe with an epoxy coated felt lining to provide a temporary strengthening of the pipe.

Sewage Discharge and Spill Response

The Haymar gravity sewer main is a 15-inch vitrified clay sewage pipe installed by the City in 1961. The Haymar line conveys untreated sewage from the southeastern portions of the City to the Buena Vista lift station and ultimately to the San Luis Rey Wastewater Treatment Plant (see Figure 4).

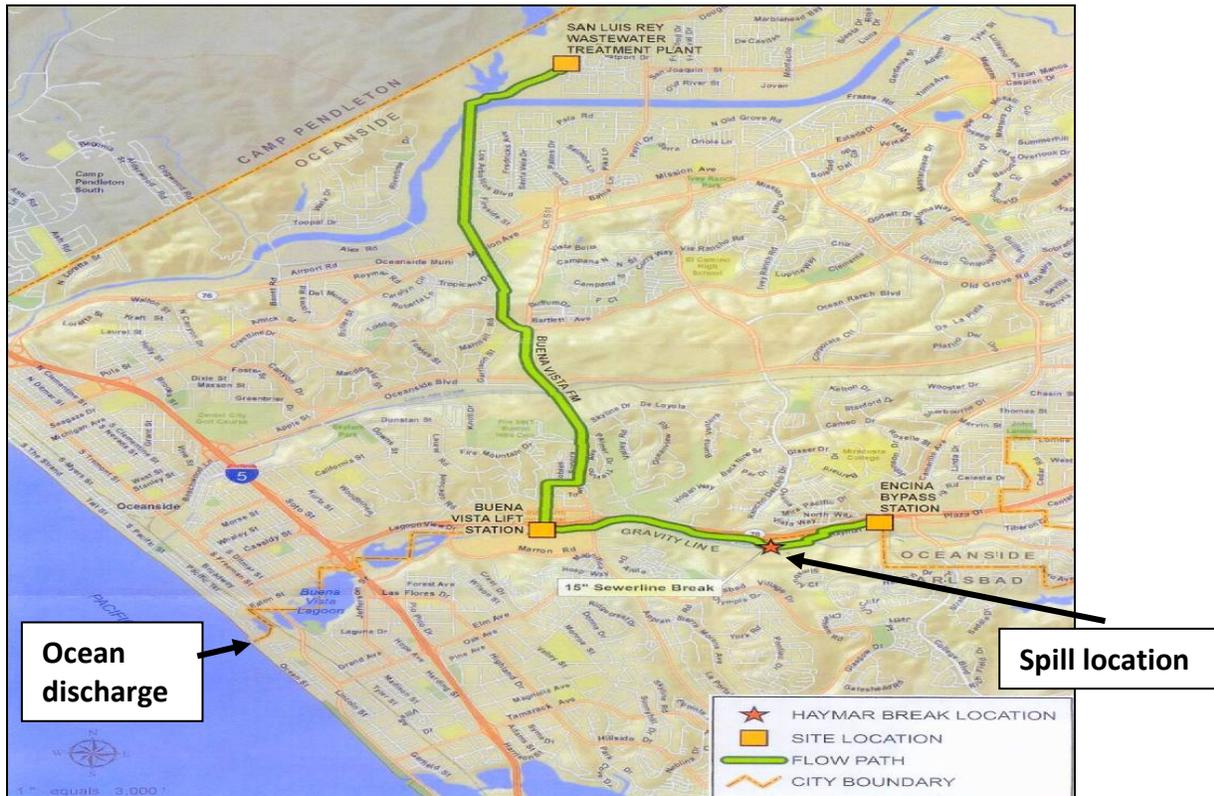


Figure 4. Overview of Haymar gravity sewage main

A major storm event occurred December 17-23, 2010. While short duration bursts were not exceedingly heavy, steady light to moderate rain continued for hours at a time, producing large rainfall totals across the region. During this six-day period, the Oceanside area experienced almost 9-inches of rain, which the County of San Diego Hydrology Section determined to be a 45-year storm frequency.¹

On Wednesday December 22, 2010, the heavy rains inundated the sewer system along Highway 78. The Buena Vista lift station was overwhelmed causing a 40,000 gallon spill of raw sewage, which was completely contained and returned to the collection system. To help address the heavy flows coming into the system, at 9:10 a.m. the City diverted flows from the Buena Vista line into the adjacent City of Vista pipeline.

¹ Rainfall data provided by the County of San Diego Hydrology Section in email from Cid Tesoro on January 20, 2011.

On Thursday December 23, 2010 the rains stopped and sewer flows returned to normal levels and at 8:35 a.m. the City made the decision to close the diversion gate and restore flows back to the Buena Vista line. From that time on the Haymar sewer line was active and sending flows to the Buena Vista lift station. The City reports that it was not possible to inspect the line because it was submerged by high creek flows topping the banks of Buena Vista Creek (see Figure No. 5). This was the last time the Haymar line was known to be operational. From December 24-27, 2010 the Haymar line was submerged within the swollen creek and the City was unable to inspect the area.



Figure 5. Buena Vista Creek flooding December 2010

At approximately 9:30 a.m. on December 28, 2011 high flows from the late December storms subsided in Buena Vista Creek. The City of Oceanside staff arrived at the creek to inspect the Haymar line and found that the upstream exposed section of sewer pipe had separated within the creek. The failed section was discharging raw sewage directly into Buena Vista Creek, Buena Vista Lagoon and the Pacific Ocean (see Figure 6).



Figure 6. Haymar sewer line failure, January 5, 2011

Upon discovery of the failure of the Haymar line, City staff proceeded to plug the broken line and open the gate to divert flows from the Encina Bypass Station back to the City of Vista line. The break was discovered at approximately 9:30 a.m. The discharge was terminated and flow diverted by 11:00 a.m. on December 28, 2010.

Warnings signs were then posted by City staff at public access areas in Buena Vista Lagoon and 1,000 feet north and south of the lagoon mouth (see Figure 7). These areas remained posted until January 12, 2011.

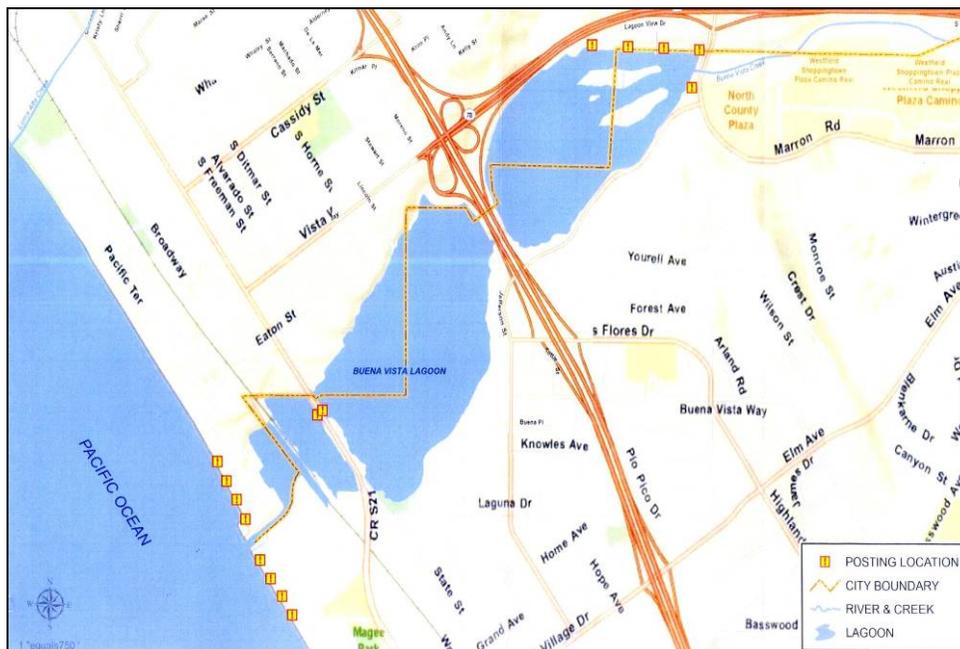


Figure 7. City postings of warning signs in Buena Vista Lagoon

Subsequent to the discovery of the pipe break and cessation of the discharge, the City proceeded with a modified version of the original pipeline realignment project. The modified realignment project consisted of access road improvements, horizontal directional drilling instead of trenching to replace 440-feet of the Haymar sewer line, and construction of new manholes

Construction activities commenced on January 21, 2011, and project completion occurred on February 28, 2011. The City estimates that the total cost of the project was \$535,900. The project was funded through an Emergency Response Account set up for the December 2010 storm damages. The Account was funded by miscellaneous sewer project funds.

Investigation into Cause of Pipeline Failure

During the storm event in late December 2010, flows in Buena Vista Creek were monitored by a transmitter owned by Weston Solutions. The monitor was located downstream of the break. The data shows that the flows increased dramatically in Buena Vista Creek from a normal dry weather flow rate of 2.8-7.5 cubic feet per second (cfs) to a maximum flow on December 22, 2010 of over 700 cfs (Figure 8).

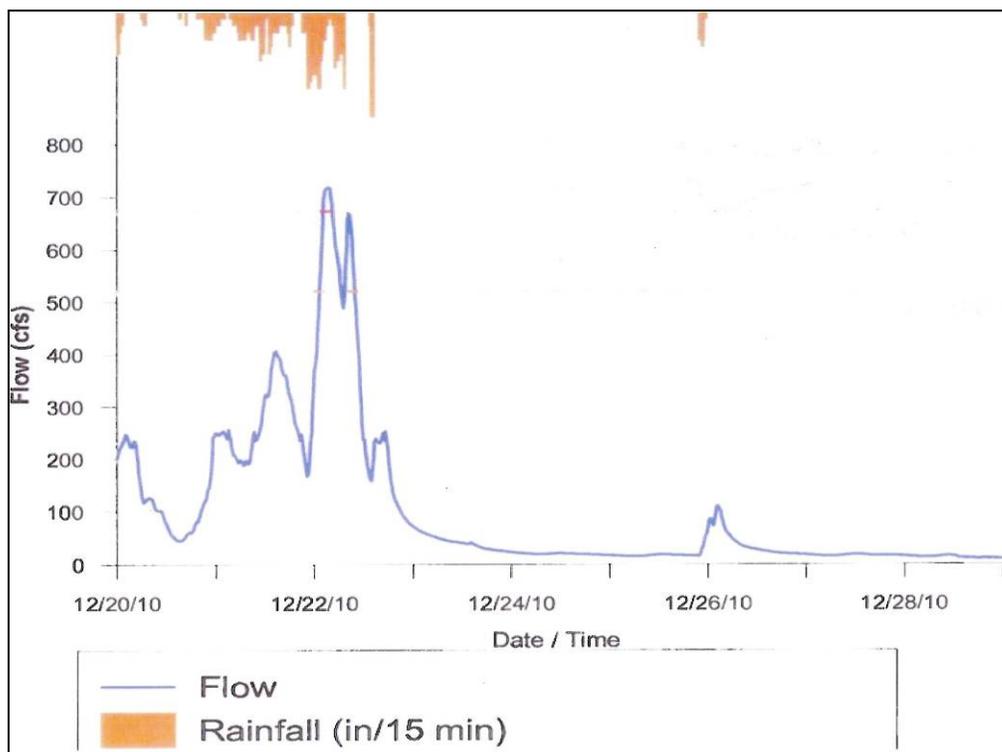


Figure 8. Hydrograph of December 2010 rain event, Buena Vista Creek

Based on the visual inspection of the pipe after the break, and structural calculations prepared by Infrastructure Engineering Corporation, it appears that the pressure exerted by the increased flows against the unsupported and exposed pipe exceeded the stress allowances for both the vitrified clay pipe and the internal liner of the pipe. The pipe sheered on either side of the creek where it entered and exited the creek. Neither the pipe nor the liner, or the combination of both, were designed to withstand the sheer stress exerted by the flows in the creek, resulting in a catastrophic failure of the pipe.

Calculation of Sewage Discharge Volume

Although the City had been aware of the threat posed by the exposed Haymar line since 2006, it did not install additional flow monitoring on the exposed sections of line. This would have enabled the City to monitor the operation and functioning of the sewer main. This lack of monitoring capability made it impossible for the City to determine an exact time of failure of the line, or determine an accurate volume for the discharge of sewage to the waters of the State.

Utilizing flow monitoring data from the 36-inch sewer main to the west, which connects the Haymar line and transports sewage flows to the San Luis Rey Wastewater Treatment Plant, the City estimated that daily flow in the Haymar line was on average 1.05 million gallons per day (MGD). The City utilized this average daily volume to calculate various scenarios for total discharge volume which depend on when the catastrophic failure of sewage line occurred. These total discharge volumes ranged from a minimum of 180,000 gallons (assuming the pipe failed immediately before City staff discovered it on December 28, 2010) to a maximum of 5.35 million gallons (assuming the pipe failed on December 23, 2010 after the line was put back in service).

For the purposes of this technical analysis the prosecution team used the most likely estimate of 5.35 million gallons as the total volume of sewage discharged. The City's investigation into the cause of the pipe failure concluded that the force exerted by the creek in high flow conditions most likely caused the pipe to rupture, so it is logical to assume that the failure occurred closer to December 23 when measured flows in Buena Vista Creek were the highest.

Beneficial Uses of Affected Waters

The Water Quality Control Plan for the San Diego Basin (9) (Basin Plan) designates the beneficial uses for all surface and ground waters in the San Diego Region. These beneficial uses "form the cornerstone of water quality protection under the Basin Plan" (Basin Plan, Chapter 2). Beneficial uses are defined in the Basin Plan as "the uses of water necessary for the survival or well-being of man, plants and wildlife."

The Basin Plan goes on to designate water quality objectives to protect the beneficial uses designated in Chapter 2. Water Code Section 13050(h) defines "water quality objectives" as follows:

“The limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area.”

Water quality objectives may be numerical values for water quality constituents or narrative descriptions and must be based on sound water quality criteria needed to protect the most sensitive beneficial uses designated for a water body.

Table 1 provides the existing beneficial uses of surface waters designated by the Basin Plan for Buena Vista Creek, Buena Vista Lagoon, and the Pacific Ocean. Assimilative capacity of these surface waters to reduce the impact of raw sewage discharges is not a beneficial use.

Beneficial Use	Buena Vista Creek	Buena Vista Lagoon	Pacific Ocean
Agricultural (AGR)	X		
Industrial (IND)	X		X
Contact Recreation (REC-1)	X	X	X
Non-Contact Recreation (REC-2)	X	X	X
Warm Freshwater Habitat (WARM)	X	X	
Wildlife Habitat (WILD)	X	X	X
Rare Threatened or Endangered Species (RARE)	X	X	X
Preservation of Biological Habitats of Special Significance (BIOL)		X	X
Marine Habitat (MAR)		X	X
Navigation (NAV)			X
Commercial and Sport Fishing (COMM)			X
Aquaculture (AQUA)			X
Migration of Aquatic Organisms (MIGR)			X
Spawning, Reproduction and Early Development (SPAWN)			X
Shell Fish Harvesting (SHELL)			X

Table 1. Beneficial Uses of Impacted Waters

Impacts to Beneficial Uses

Untreated sewage contains a mixture of contaminants including a variety of bacteria, protozoans viruses, and toxic chemicals and high concentrations of nitrogen and phosphorous. Viruses and bacteria are a potential vehicle for disease transmission to ecological receptors. Wildlife exposure to untreated sewage can result in suppression of the immune response system, alterations in defense mechanisms, and the depression of essential biological activity that can lead to susceptibility to disease and latent infections. Amphibians are especially sensitive to a number of bacteria found in raw sewage.

The spill resulted in direct threats to recreational beneficial uses in the surface waters, particularly at the ocean, where warning signs were posted and closure signs would have been required had the spill been recognized earlier. It is also reasonable to assume that elevated pollutant concentrations negatively impacted the biota that came into contact with the sewage during the five day spill. Moreover, the failure of the sewer line introduced an estimated 41,277 pounds of additional pollutants to waters of the State already impaired by urban stormwater runoff.

City's Assessment of Spill Impacts

In response to Investigative Order R9-2011-0035 the City hired Weston Solutions to perform monitoring to assess the potential short and long term impacts of the spill on public health, plant and animal communities and the overall ecosystem downstream of the discharge.² Water quality monitoring, bioassessment, fish sampling and habitat surveys were conducted from March 18, 2011 through April 1, 2011. Samples were collected upstream and downstream of the discharge point and in the eastern section of Buena Vista Lagoon.

The short and long term impacts were estimated by Weston utilizing various sampling and analytical tools including:

1. Event flow and rainfall analysis,
2. Water quality sampling, and historical monitoring data,
3. Bioassessment using benthic macroinvertebrates and stream algae,
4. Biological surveys for plant and animal communities within the spill area, and
5. Fish tissue samples

² The City provided the results of this initial analysis in an April 4, 2011 report, *Buena Vista Creek and Lagoon Monitoring and Analysis Support in Response to Investigation Order R9-2011-0035*.

Event Flow and Rainfall Analysis

Based on flow data obtained from a County monitoring station within Buena Vista Creek (BVC-TWAS-1), Weston noted that during the 24-hour storm event beginning December 21-22, 2010 Buena Vista Creek watershed received a total of 3.48 inches of rainfall. The rainfall resulted in peak flows of over 700 cfs, which Weston determined is the equivalent of a storm with a return period in the range of a 13-100 year storm.

Assuming that the pipe failed on December 23, 2010, the 5-day discharge of raw sewage would have totaled 5.35 million gallons. During that period approximately 78.1 million gallons of storm water was recorded flowing through the Creek.

The Weston analysis concluded that sewage being discharged from the ruptured pipe resulted in “slight” increases in bacteria concentrations. However, the discharge of untreated raw sewage grossly exceeded the water quality objectives established in the Basin Plan by several orders of magnitude. Water quality objectives are designated in the Basin Plan to protect the existing beneficial uses of waters in the San Diego Region and protect existing high quality waters of the State.

Table 2 provides a summary of the estimated maximum bacterial concentrations of the sewage spill compared to historical minimum and maximum bacterial concentrations measured at the County’s monitoring station.

Indicator Bacteria	Estimated Maximum Concentration in the Creek from Sewage Spill (MPN/100ml)	Historical Minimum Storm Concentrations Measured at BVC-TWAS-1 (MPN/100ml)	Historical Maximum Concentrations Measured at BVC-TWAS-1 (MPN/100ml)	Basin Plan Water Quality Objectives ³ (MPN/100ml)
Total Coliform	3,812,000	50,000	170,000	400
Fecal Coliform	1,398,000	5,000	28,000	400
Enterococci	369,000	8,000	110,000	33

Table 2. Estimated bacteria concentrations from spill compared to historical measurements

Table 3 provides a summary of the estimated pollutant loading to Buena Vista Creek as a result of the sewage spill and estimated ambient loads due to storm water runoff based on historical monitoring from two storm events.

Constituent	Estimated Load from Sewage Spill (lbs.)	Estimated Load in Ambient Stormwater Runoff During Sewage Spill (lbs.)	Estimated Increase in Pollutant Load from Spill
Total Nitrogen	1,386	3,179	44%
Total Dissolved Solids	39,712	272,326	15%
Methylene Blue Active Substances	179	35.5	604%

Table 3. Estimated pollutant loading from spill and surface runoff

³ The Basin Plan water quality objective of 400 MPN/100ml for Total and Fecal Coliform are established such that no more than 10 percent of total samples in a thirty day period in REC-1 waters shall exceed this objective. The Enterococci water quality objective of 33 MPN/100ml is a U.S.EPA criterion for REC-1 waters in a steady state.

Any objective review of the pollutant loading estimates provided by the City would be hard pressed to come to the same conclusion that Weston Solutions did that only “slight” increases in concentrations of bacteria resulted from the spill. Estimated Total Coliform and Fecal Coliform concentrations were many orders of magnitude above historical observed maximum concentrations and Fecal Coliform concentrations were three times that of past observed maximum concentrations.

Stream Bioassessment Sampling

Weston conducted stream bioassessment monitoring⁴ of benthic macroinvertebrates and stream algae 300 meters upstream of the spill and 900 meters downstream of the spill site on March 18, 2010. The study concluded that based on an analysis of historical data, the pre-spill biotic conditions were similar to the post-spill conditions encountered in March 2011.

The March 2011 sampling found that both sites had substantially degraded benthic macroinvertebrate communities and fair to poor benthic algae communities. The benthic macroinvertebrate community downstream of the discharge was of marginally higher quality than upstream of the discharge, but this minor improvement in IBI scores is statistically insignificant, and both sites are typical of urbanized watershed in Southern California.

At this time, there is no Southern California Index of Biotic Integrity for stream algae. Based on a review of the algae data, Weston Solutions concluded that “...some effect from organic enrichment and nutrients likely has occurred at both sites, but the downstream site did not have any of the diatom taxa indicative of organic waste that were not observed at the upstream site.”

Biological Surveys and Interviews

Marquez and Associates was contracted by Weston Solutions and the City to conduct biological surveys to evaluate the potential short and long term impacts of the discharge on upland animal and plant communities, including sensitive and/or endangered species.

Based on the review of the available databases and online sources Marquez and Associates determined that the threatened and endangered species known to occur in or utilize the area included:

⁴ Bioassessment is the science of using aquatic organisms as indicators of ecological condition in streams. Many types of organisms can be used as indicators, for example fish or algae, but bioassessment is most frequently based on benthic macroinvertebrates (BMIs), which are small but visible bottom-dwelling organisms such as insects. BMI data sets typically consist of long lists of species (or taxa) found in a sample and their relative abundances. These data can be simplified into measures of biological condition such as indices of biotic integrity (IBIs) that are designed to be sensitive to human-caused alterations to the landscape, to stream channels and riparian zones, and to water chemistry. IBIs function much like economic indicators: high IBI scores reflect good ecological conditions while low IBI scores reflect poor ecological conditions.

- a. California Gnatcatcher (Federal threatened)
- b. Light Footed Clapper Rail (Federal and State Endangered)
- c. California Least Tern (Federal and State Endangered)
- d. Least Bell's Vireo (Federal and State Endangered)
- e. Belding's Savannah Sparrow (State Endangered)
- f. Thread-leaved Brodiaea (Federal threatened, State Endangered)

The study area surveyed for the evaluation was divided into three sections from east to west (Figure 9), and included: 1) the Buena Vista Creek Ecological Reserve Section – comprised of a 0.8 mile length of the creek from the eastern terminus of Haymar Drive to the Carlsbad Golf Center driving range; 2) Buena Vista Creek Mid-Section, comprised of a 1.3 mile stretch of the creek from the golf center to Buena Vista Lagoon; and 3) the Buena Vista Lagoon section comprised of a 1.5 mile length of Buena Vista Lagoon culminating at the Pacific Ocean.

A California Gnatcatcher in the Buena Vista Ecological Reserve was the only threatened or endangered species detected in the surveys. The Light Footed Clapper Rail and Belding's Savannah Sparrow were present in Buena Vista Lagoon in an area potentially affected by the spill. The California Gnatcatcher and Thread Leaved Brodiaea were present but the evaluation concluded that these species were likely located beyond the area affected by the spill. The California Least Tern and the Least Bell's Vireo are summer residents of the area and were not present during the discharge event.

Marquez and Associates interviewed staff from the Center for Natural Lands Management and the Buena Vista Lagoon Foundation. The general consensus of the interviews was that due to the storm event the sewage did not cause the sort of damage that would have been noticeable under drier conditions.

While the biological surveys conducted three months after the discharge did not find any evidence of short or long term impacts as a result of the spill, in report's conclusion rightly notes that although no impacts were detected it "...does not guarantee damage was not incurred."

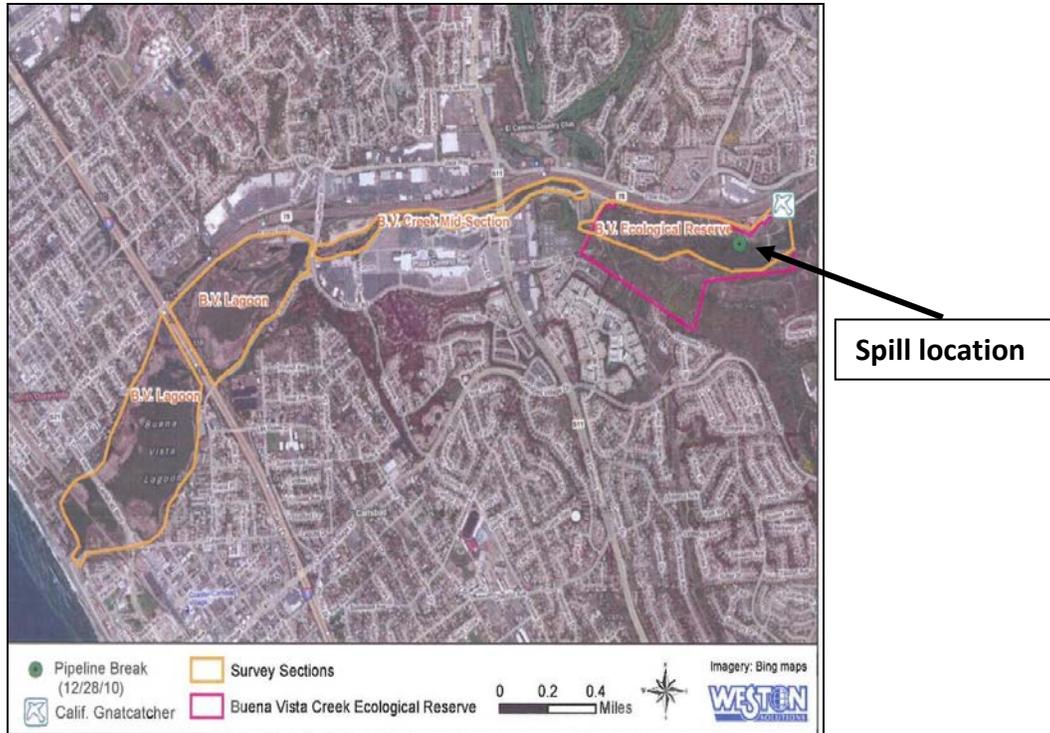


Figure 9. Biological survey sections for Buena Vista Creek

Fish Tissue Samples

Fish tissue samples were to assess the potential impacts of the spill on recreational fish species within Buena Vista Lagoon. Three largemouth bass (*Micropterus salmoides*) were caught and sampled. The results showed trace levels of lead, selenium and zinc detected. Weston assumed in its analysis that sewage was not the source for these pollutants, however; it provided no basis for this assumption.

C. VIOLATIONS SUBJECT TO THE COMPLAINT

The City is required to operate and maintain its collection system in compliance with requirements contained in State Water Board Order No. 2006-0003-DWQ, *Statewide General Waste Discharge Requirements for Sanitary Sewer Systems*, and San Diego Water Board Order No. R9-2007-0005, *Waste Discharge Requirements for Sewage Collection Systems in the San Diego Region*.

The following violations of Prohibitions contained in Order Nos. 2006-0003-DWQ and R9-2007-0005, Section 301 of the Clean Water Act and California Water Code (Water Code) section 13376 are the basis for assessing administrative civil liability pursuant to Water Code section 13385.

1. The City Discharged Untreated Sewage to Waters of the State

The City violated Prohibition C.1 of Order No. 2006-0003-DWQ which states "Any SSO (sanitary sewer overflow) that results in the discharge of untreated or partially treated wastewater to waters of the United States is prohibited."

2. The City Created a Condition of Nuisance

The City violated Prohibition C.2 of Order No. 2006-0003-DWQ which states "Any SSO that results in a discharge of untreated or partially treated wastewater that creates a nuisance as defined in California Water Code Section 13050(m) is prohibited."⁵

3. The City Discharged Untreated Sewage Upstream of a Sewage Treatment Plant

The City violated Prohibition B.1 of Order No. R9-2007-0005 which states "The discharge of sewage from a sanitary sewer system at any point upstream of a sewage treatment plant is prohibited."

4. The City Discharged Pollutants to Surface Waters without an NPDES Permit

The City violated section 301 of the Clean Water Act (33 U.S.C. § 1311) and Water Code section 13376 which prohibit the discharge of pollutants to surface waters except in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. There is no NPDES permit that authorizes the discharge of untreated sewage to Buena Vista Creek and Buena Vista Lagoon.

⁵ California Water Code Section 13050(m) defines nuisance as anything which meets all the following requirements: 1) is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of the treatment or disposal of wastes.

D. DETERMINATION OF ADMINISTRATIVE CIVIL LIABILITY

Administrative civil liability (ACL) may be imposed pursuant to the procedures described in Water Code section 13323. The complaint alleges the act or failure to act that constitutes a violation of law, the provision of law authorizing civil liability to be imposed, and the proposed civil liability.

Pursuant to Water Code section 13385(a)(2), any person or entity who, in violation of any Waste Discharge Requirements issued by a Regional Water Board, discharges waste, or causes or permits waste to be deposited where it is discharged into waters of the United States, is subject to administrative civil liability pursuant to Water Code section 13385(c)(2), which provides that any portion of a discharge greater than one thousand (1,000) gallons which is not susceptible to cleanup, or is not cleaned up may be assessed a liability not to exceed ten (10) dollars a gallon.

Water Code section 13385(e) requires the San Diego Water Board to consider several factors when determining the amount of civil liability to impose pursuant to section 13385. These factors include: "...the nature, circumstances, extent, and gravity of the violation or violations, whether the discharge is susceptible to cleanup or abatement, the degree of toxicity of the discharge, and, with respect to the violator, the ability to pay, the effect on its ability to continue its business, any voluntary cleanup efforts undertaken, any prior history of violations, the degree of culpability, economic benefit or savings, if any, resulting from the violation, and other matters that justice may require. At a minimum, liability shall be assessed at a level that recovers the economic benefits, if any, derived from the acts that constitute the violation."

The 2009 State Water Resources Control Board Water Quality Enforcement Policy,⁶ Section VI, provides a penalty calculation methodology for Regional Water Boards to use in administrative civil liability cases. The penalty calculation methodology enables the water boards to fairly and consistently implement liability provisions of the Water Code for maximum enforcement impact to address, correct, and deter water quality violations. The penalty calculation methodology provides a consistent approach and analysis of factors to determine liability based on the applicable Water Code section.

1. Step 1: Potential for Harm for Discharge Violations

Pursuant to the Enforcement Policy, the San Diego Water Board shall calculate actual or threatened impacts to beneficial uses using a three-factor scoring system to determine a final score for potential for harm. The three factors utilized in the determination of the potential for harm score include; (a) the potential for harm to beneficial uses; (b) the degree of toxicity of the discharge; and (c) the discharges susceptibility to cleanup or abatement for any violation or group of violations. The scores for these factors are then added to give a final Potential for Harm score.

⁶ The Enforcement Policy may be found at:
http://www.waterboards.ca.gov/water_issues/programs/enforcement/docs/enf_policy_final111709.pdf

As further detailed below, a score of **six** is assigned to Step 1 of the penalty calculation.

a. Factor 1: Harm or Potential Harm to Beneficial Uses

This factor evaluates direct or indirect harm or potential for harm from the violation. A score between 0 (negligible) and 5 (major) is assigned in accordance with the statutory factors of the nature, circumstances, extent and gravity of the violation.

The discharge of 5.35 million gallons of untreated sewage resulted in below moderate harm to the beneficial uses of Buena Vista Creek, Buena Vista Lagoon and the Pacific Ocean. Accordingly a score of **two** is assigned to Factor 1 of the penalty calculation. The Enforcement Policy defines below moderate as:

“Below Moderate – less than moderate threat to beneficial uses (i.e., impacts are observed or reasonably expected, harm to beneficial uses is minor.”

The discharge of sewage can cause a public nuisance, particularly when raw untreated wastewater is discharged to areas with high public exposure, such as streets or surface waters used for drinking, fishing, or body contact recreation. SSOs pollute surface or ground waters, threaten public health, adversely affect aquatic life, and impair the recreational use and aesthetic enjoyment of surface waters.

While there is no evidence available indicating the lack or presence of short term impacts to the ecosystem of Buena Vista Creek and Buena Vista Lagoon, it is reasonably expected that a discharge of this magnitude had the potential for localized short term impacts to the biota that came in contact with the sewage. As stream flow decreased from a high of 700 cfs on December 22, 2010 to well below 100 cfs through December 28, 2010, pollutant concentrations in the surface waters from the raw sewage discharge would have greatly increased, thus increasing the likelihood of adverse exposure to the organisms residing in Buena Vista Creek and Buena Vista Lagoon.

Analyses from the City’s consultants provided a snapshot of conditions within the impact area three months after the spill. Because there is no definitive evidence of long term impacts as a result of the discharge, a score of 2, representing below moderate impacts to beneficial uses, is appropriate.

Had a spill of this magnitude occurred in drier conditions the impacts to the environment could have been greatly magnified.

b. Factor 2 : Physical, Chemical, Biological or Thermal Characteristics of the Discharge

The characteristics of the discharged material posed an **above-moderate** (score of 3) risk or threat to potential receptors. The Enforcement Policy defines above-moderate as:

“Discharged material poses an above-moderate risk or direct threat to potential receptors (i.e., the chemical and/or physical characteristics of the discharged material exceed known risk factors and/or there is substantial concern regarding receptor protection).”

In its response to investigative Order R9-2011-0035, the City characterized the quality of its untreated sewage influent to the San Luis Rey Wastewater Treatment Plant for a variety of pollutants. Table 4 below summarizes the result of that characterization:

Constituent	Unit of Measure	Test Results	Water Quality Objective
Total Nitrogen	mg/L	50	1.0
Total Dissolved Solids	mg/L	980	500
Chloride	mg/L	233	250
Sulfate	mg/L	253	250
Iron	mg/L	4.4	0.3
Manganese	mg/L	0.3	0.05
Biological Oxygen Demand	mg/L	255	--
Methylene Blue Activated Substances	mg/L	3.0	0.5

Table 4. Characterization of Oceanside raw sewage influent

Untreated sewage contains high levels of suspended solids, pathogenic organisms, toxic pollutants, nutrients, oxygen-demanding organic compounds, oil and grease and other pollutants. The high degree of toxicity in untreated sewage poses a direct threat to human and ecological receptors. Accordingly, a score of **three** is assigned to Factor 2.

c. Factor 3: Susceptibility to Cleanup or Abatement

Pursuant to the Enforcement Policy a score of zero (0) is assigned for this factor if 50 percent or more of the discharge is susceptible to cleanup or abatement. A score of one (1) is assigned for this factor if less than 50 percent of the discharge is susceptible to cleanup or abatement.

In this case, none of the discharged sewage was susceptible to cleanup or abatement. The spill was unnoticed for days, which allowed the sewage to disperse broadly and precluded opportunities for cleanup and abatement. Accordingly, a score of one (**1**) is assigned to Factor 3.

Based on the above scores for harm to the environment (below moderate, score of 2), risk to potential receptors (above moderate, score of 3), and susceptibility to cleanup (less than 50 percent cleaned up, score of 1), a total score of 6 is assigned to Step 1 of the penalty calculation methodology,

2. Step 2: Assessments for Discharge Violations

Water Code section 13385(c) states that the San Diego Water Board may impose civil liability pursuant to section 13323 in an amount up to ten thousand dollars (\$10,000) for each day in which the violation occurs and where there is a discharge, any portion of which is not susceptible to cleanup or is not cleaned up, and the volume discharged but not cleaned up exceeds 1,000 gallons, provides for an additional liability not to exceed ten dollars (\$10) multiplied by the number of gallons by which the volume discharged but not cleaned up exceeds 1,000 gallons.

In the case of a high volume discharge, the Enforcement Policy provides that the water boards shall determine an initial liability amount on a per gallon basis using the Potential for Harm score (step 1) and the Extent of Deviation from the Requirement of the violation.

a. Extent of Deviation from Requirement

The discharge of 5.35 million gallons of untreated sewage is a major deviation from required standards (Discharge Prohibitions). Accordingly, using the Potential for harm score of **six** derived from Step 1 and “Table 1 – Per Gallon Factor for Discharges” of the Enforcement Policy, the per-gallon deviation factor is **0.22**.

The penalty calculation methodology defines a major deviation as:

“The requirement has been rendered ineffective (e.g., discharger disregards the requirement, and/or the requirement is rendered ineffective in its essential functions.”

The City is in violation of numerous discharge prohibitions contained in Orders Nos. 2006-0003-DWQ and R9-2007-0005. While the City did not consciously disregard these requirements, the magnitude and duration of the spill to surface waters rendered the essential functions the Discharge Prohibitions completely ineffective.

b. Initial Amount of the ACL

The maximum per gallon liability amount allowed under Water Code section 13385(c)(2) is ten dollars (\$10) per gallon of waste discharged exceeding 1,000 gallons of the discharge not susceptible to cleanup, or not cleaned up. Since the volume of sewage spills can be very large (as in this instance), however, the Enforcement Policy suggests limiting the maximum initial liability for high volume discharges to two dollars (\$2.00) per gallon in this step of the penalty calculation, unless that results in an inappropriately small penalty based on the unique facts of the case.

Calculating the initial base amount of the ACL for the discharge is achieved by multiplying:

(Per Gallon Deviation Factor) X (Gallons) X (Adjusted Maximum per Gallon) =
(Initial ACL Amount)

$$(0.22) \times (5,349,000) \times (\$2.00) = \mathbf{\$2,353,560}$$

3. Step 3: Per Day Assessments for Non-Discharge Violations

This step does not apply. Non-discharge violations are not alleged in the ACL Complaint.

4. Step 4: Adjustment Factors

The Enforcement Policy describes three factors related to the violator's conduct that should be considered for modification of the amount of initial liability: the violator's culpability, the violator's efforts to cleanup or cooperate with regulatory authorities after the violation, and the violator's compliance history. After each of these factors is considered for the violations involved, the applicable factor should be multiplied by the proposed amount for each violation to determine the revised amount for that violation.

a. Adjustment for Culpability

For culpability, the Enforcement Policy suggests an adjustment resulting in a multiplier between 0.5 to 1.5, with the lower multiplier for accidental incidents, and the higher multiplier for intentional or negligent behavior. In this case a culpability multiplier of **0.8** has been selected as detailed below.

In response to the Investigative Order, the City documented the delays it encountered from 2006 to 2010 in obtaining the necessary easements from CDF&G to complete the Haymar sewer relocation project. In April 2010 when the second section of exposed sewer pipe was discovered within the creek, the City hired an engineering firm and an environmental consulting firm to inspect this section of pipe and evaluate alternatives for addressing the potential threat it posed to the environment.

From July through October 2010 the City worked with the ACOE to secure a Section 404 permit for impacts to Waters of the U.S. associated with the proposed realignment project. The City states that at some time in July 2010 it inquired with the ACOE about the possibility of obtaining an emergency general permit (RGP 63) for the project. It was told that the ACOE could not issue this emergency permit because the pipe was active, not damaged, and the City had not declared its own emergency, and as such, it did not meet the terms for issuance of RGP 63. Rather than championing the urgent need to realign the pipe through an emergency permit, the City proceeded to continue to provide the ACOE with the information needed for a standard Section 404 permit.

On August 10, 2010, staff from the City, Tetra Tech Inc., and Helix Environmental Planning inspected the newly found second portion of exposed sewer line within the creek. The line was found to be exposed and unsupported and submerged in the creek channel. The City requested that the consultants review the feasibility of two interim solutions to reduce the likelihood of a catastrophic failure of the exposed pipe. These interim solutions included concrete encasement of the pipe and lining the pipe with a resin coated liner.

The findings and recommendations of both consultants were essentially the same, concluding that while slip lining the pipe was the more favorable of the City's two proposed options, it would not eliminate the chance of a catastrophic failure.

Tetra Tech's September 3, 2010 memorandum concluded that:

"As stated, the lining would only be an added temporary measure of safety and the sewer line would still be at risk of failure and sanitary sewer overflow as rain conditions this winter may present a problem. Therefore the realignment project should continue to move forward with urgency."

Helix Environmental Planning's September 16, 2010 report expanded on this theme by concluding that:

"It is my opinion that the City should attempt to move forward with the realignment of the pipeline under an emergency action and attempt to complete the work immediately. If the pipeline were to break, fines for sewage spills can be up to \$10 per gallon. If the pipeline were to break and the break go unnoticed for some time, the potential fine could be in the hundreds of thousands of dollars or more. I believe that the Corps, CDFG, U.S. Fish and Wildlife Service, RWQCB and the City of Carlsbad would all be willing to work under an emergency scenario to allow the project to be completed prior to the onset of winter rains."

With two sections of sewer pipe exposed and suspended within the creek, and another rainy season approaching, the City again failed to elevate the urgency of its request to the ACOE and other resource agencies to obtain emergency authorization to conduct the sewer line realignment project. Instead, the City proceeded with scheduling a slip lining project as if there was not an imminent threat of the suspended pipeline failing.

Upon discovery of the pipe break in December 2010, the City finally did apply for an emergency RGP No.63 from the ACOE to complete the realignment project. The ACOE determined that the emergency project did not require authorization from the ACOE to proceed, and no permit was required. This determination negated the need for a CWA Section 401 Water Quality Certification from the San Diego Water Board. CDF&G also determined that no permit was required. This allowed the emergency realignment project to proceed almost immediately. Construction commenced on January 24, 2011, and was completed a little over a month later on February 28, 2011.

The City faced many regulatory hurdles to complete the required permitting for the pipeline realignment project, but its reluctance to completely remove the pipe from the creek also added to the delays in the process that resulted in the catastrophic failure of the Haymar gravity sewer line. Based on all the evidence provided, the Prosecution Team has assigned a culpability factor to 0.8 to reflect the complexity of the process and circumstances affecting the City's project.

b. Adjustment for Cleanup and Cooperation

For cleanup and cooperation, the Enforcement Policy suggests an adjustment should result in a multiplier between 0.75 to 1.5, with the lower multiplier where there is a high degree of cleanup and cooperation. In this case a Cleanup and Cooperation multiplier of **0.75** has been selected.

Upon detecting the spill, the City responded quickly, terminated the discharge within an hour of its discovery, and completed the realignment project within two months of the spill. The City also submitted timely responses to the Investigative Order issued by the San Diego Water Board following the spill. These actions constitute justification for a multiplier that produces the maximum downward adjustment in this factor.

c. Adjustment for History of Violations

The Enforcement Policy suggests that where there is a history of repeat violations, a minimum multiplier of 1.1 should be used to reflect this. In this case, a multiplier of **1.1** is recommended for the City's past history of public sewage spills.

Based on the California Integrated Water Quality System (CIWQS) Sanitary Sewer Overflow database for the period of January 1, 2007 to December 31, 2010, the City reported 26 public Category 1 SSOs prior to the 5.35 million gallon spill in Buena Vista Creek.⁷ These 26 spills resulted in a total of 240,473 gallons being discharged, of which 190,489 gallons were recovered and reintroduced to the sanitary sewer system. Therefore, over the four years prior to the Haymar Line incident, the City discharged 27,198 gallons of sewage to surface waters of the State.

The CIWQS data demonstrate that there is a history of repeat violations. However, the minimum multiplier is appropriate because the City has been able to minimize the damage by preventing high volume spills and by recovering much of the sewage.

d. Adjustment for Multiple Violations Resulting from the Same Incident

The Enforcement Policy provides that for situations not addressed by statute, a single base liability amount can also be assessed for multiple violations resulting from the same incident at the discretion of the Regional Water Boards under certain, specific circumstances. Except where statutorily required, however, multiple violations shall not be grouped and considered as a single base liability amount when those multiple violations each result in a distinguishable economic benefit to the violator.

Although the ACL Complaint alleges multiple violations of waste discharge requirements and the Clean Water Act, these violations stem from a single incident (the pipe failure). The single economic benefit described below in Step 8 from the savings of treating the discharged sewage warrants the liability being assessed with a single liability amount.

e. Adjustment for Multiple Day Violations

The Enforcement Policy provides that for violations lasting more than 30 days, the San Diego Water Board may adjust the per-day basis for civil liability if certain findings are made and provided that the adjusted per-day basis is no less than the per day economic benefit, if any, resulting from the violation.

⁷ Order No. 2006-0003-DWQ defines a Category 1 spill to be a discharge of sewage that equals or exceeds 1000 gallons; or results in a discharge to a drainage channel or surface water; or a discharge into a storm drainpipe that was that was no fully captured and returned to the sanitary sewer system.

The Prosecution Team is unable to ascertain how long the negative effects of the sewage spill lasted once the discharge had been terminated. The lack of useful monitoring data immediately after the spill precludes identifying how long the negative impacts persisted, or the eventual fate and dispersion of the sewage that was discharged. Therefore, lacking this evidence, the Prosecution Team must conclude that since the discharge of 5.35 million gallons of untreated sewage did not last more than 30 days, this adjustment factor does not apply.

5. Step 5: Determination of Total Base Liability Amount

The Total Base Liability amount of **\$1,553,350** is determined by adding the initial liability amounts for each violation and applying the adjustment factors in step 4. Accordingly, the Total Base Liability amount for the violations is calculated by multiplying the total base liability by the adjustment factors:

$$\begin{aligned} &(\text{Initial Base Liability}) \times (\text{Culpability}) \times (\text{Cleanup}) \times (\text{History of Violations}) = \\ &(\$2,353,560) \times (0.8) \times (0.75) \times (1.1) = \$1,553,350 \end{aligned}$$

6. Step 6: Ability to Pay and Ability to Continue Business

The Enforcement Policy provides that if the San Diego Water Board has sufficient financial information necessary to assess the violator's ability to pay the Total Base Liability or to assess the effect of the Total Base Liability on the violator's ability to continue in business, then the Total Base Liability amount may be adjusted downward. Similarly, if a violator's ability to pay is greater than similarly situated dischargers, it may justify an increase in the amount to provide a sufficient deterrent effect.

The City of Oceanside argues that it has an inability to pay the recommended administrative penalty. The City submitted its 2010 Fiscal Year Comprehensive Annual Financial Report (CAFR) and the most recent quarterly financial report for the San Diego Water Board's consideration.

The San Diego Water Board has analyzed the financial information submitted by the City, along with budget information from its Enterprise Fund for Water Utilities, available on the City of Oceanside's website. Financial information was analyzed using the U.S. Environmental Protection Agency's MUNIPAY model. This model projects a municipal government's ability to pay a proposed fine amount based on its overall financial health.

The financial health of the Enterprise Fund is analyzed first. If the Enterprise Fund does not have enough available capital to cover the proposed penalty, MUNIPAY⁸ looks to the City's other liquid assets, including the General Fund, as possible sources of financing. Based on the information in the 2010 CAFR, the quarterly financial report, and the Enterprise Fund for Water Utilities, the City has the ability to pay the entire proposed penalty from its Enterprise Fund.

Accordingly, the penalty factor in this step is neutral and does not weigh either for or against adjustment of the Total Base Liability. The City may provide additional financial information in response to the Complaint to demonstrate that an adjustment is warranted.

7. Step 7: Other Factors as Justice May Require

The Enforcement Policy provides that if the San Diego Water Board believes that the amount determined using the above factors is inappropriate, the liability amount may be adjusted under the provision for "other factors as justice may require," if express findings are made to justify this. In addition, the costs of investigation should be added to the liability amount according to the Enforcement Policy.

The costs of San Diego Water Board investigation to date are \$19,500. As a result the liability amount is recommended to be adjusted upward by \$19,500, bringing the total proposed liability to **\$1,572,850**. This adjustment includes staff time through the issuance of the ACL complaint. The Prosecution Team does not recommend adjustments for any other factors as justice may require.

8. Step 8: Economic Benefit

The Enforcement Policy directs the San Diego Water Board to determine any economic benefit of the violations based on the best available information, and suggests that the amount of the administrative civil liability should exceed this amount whether or not economic benefit is a statutory minimum. The economic benefit of the violations is estimated to be **\$6,420**.

The City derived economic benefit from not having to treat the 5.35 million gallons of sewage that were discharged to surface waters. The City has estimated that the allocated cost to treat 1,000,000 gallons of sewage is \$1,200.

Thus the City derived an economic benefit of:

5.35 million gallons X \$1,200/million gallons treated = \$6,420.

⁸ The MUNIPAY enforcement economic model is available from the USEPA Civil Enforcement website at: <http://www.epa.gov/compliance/civil/econmodels/index.html>

Presumably there was some economic benefit realized by the City from choosing not to proceed with the emergency project recommended by its two consultants. Had the City engaged resource agencies in October 2010, an emergency project likely could have been completed in December 2010. Based on the cost of the emergency project completed in February 2011, the economic benefit of delaying an emergency project could be in the range of \$40,000-\$60,000. Nonetheless, the proposed liability exceeds that amount. However, the Prosecution team concludes at this time that there is insufficient evidence to consider this economic benefit in the recommended liability.

9. Step 9: Maximum and Minimum Liability Amounts

The maximum liability that the San Diego Water Board may assess pursuant to Water Code section 13385(c)(2) is ten dollars (\$10.00) per gallon discharged in exceedence of 1,000 gallons. Therefore, the maximum liability the San Diego Water board may assess is **\$53,490,000**.

Water Code section 13350(e) does not set a minimum liability when utilizing the per gallon option. The 2009 Enforcement Policy requires that:

“The adjusted Total Base Liability shall be at least 10 percent higher than the Economic Benefit Amount so that liabilities are not construed as the cost of doing business and that the assessed liability provides a meaningful deterrent to future violations.”

Therefore, the minimum liability amount the San Diego Water Board may assess is \$7,062. The recommended liability falls within the allowable statutory range for minimum and maximum amounts.

10. Step 10: Final Liability Amount

This technical analysis provides the foundation for the proposed civil liability of **\$1,572,850** for the discharge of 5.35 million gallons of raw sewage to Buena Vista Creek, Buena Vista Lagoon and the Pacific Ocean. The amount corresponds to approximately \$0.25 per gallon discharged to waters of the State.

The proposed amount of civil liability attributed to the discharge of 5.35 million gallons of untreated sewage in violation of Waste Discharge Prohibitions contained in State Water Board Order No. 2006-0003-DWQ and San Diego Water Board Order No. R9-2007-0005 was determined by taking into consideration the factors in Water Code sections 13327 and 13385(e), and the penalty calculation methodology in the 2009 Enforcement Policy.

The proposed civil liability is appropriate for this untreated sewage discharge based on the following reasons:

- a. The discharge of 5.35 million gallons of raw sewage to sensitive waters of the State in an area encompassing two ecological reserves was a catastrophic occurrence that was predicted by the City's own consultants, and it likely could have been prevented had the City heeded their advice and applied for an emergency project to relocate the pipe from the creek channel.
- b. The high degree of toxicity in untreated sewage had the potential to negatively impact beneficial uses.
- c. The proposed civil liability assessment is sufficient to recover costs incurred by staff of the San Diego and State Water Board, and it serves as deterrent for future violations.