Final Report

Trinidad-Westhaven Coastal Water Quality Restoration Program / OWTS Emphasis
Clean Beaches Initiative Grant

Proposition No. 50
Grant Agreement No. 07-581-550-0
Clean Beaches Initiative Program

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Funding

Funding for this project has been provided in full or in part through an agreement with the State Water Resources Control Board. The contents of this document do not necessarily reflect the views and policies of the State Water Resources Control Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use. (Gov. Code, § 7550, 40 CFR § 31.20)

Project Basis

Trinidad and the surrounding residential area of Westhaven are located on bluffs surrounding Trinidad Bay. Trinidad and Westhaven utilize individual on-site wastewater treatment systems (OWTS), or septic systems, for wastewater treatment; there is no sewer plant. OWTS were speculated to be the major contributors of pollution draining to the beaches. Bacterial water quality levels in the bay have been high enough to cause beach closures for public health and safety. The goal of this project was to restore and protect water quality and the environment of this coastal watershed by addressing the causes of degradation.

Water quality monitoring was performed to track bacterial levels and optical brighteners (OB) in creeks above and below the areas dependent on OWTS. This data was used in conjunction with OWTS permit information to identify potential areas of OWTS failure in watersheds. The identified areas were analyzed against certain variables: high bacterial or OB indicator levels, old or unpermitted OWTS, and locations within 100 feet of a stream. High risk neighborhoods were to be contacted and offered free septic inspections. For those that failed the inspections, systems would be repaired or replaced. Success will be based on post-construction water quality monitoring.

Success

The goal of the project was to improve water quality through repairing at-risk OWTS near water sources that drain into Trinidad Bay. This was accompanied by researching water quality testing methods with a fluorometer. In this particular study, it was discovered that a fluorometer by itself may not be an adequate tool for tracking individual failing OWTS, but can be used in conjunction with other parameters in characterizing pollution, identifying impaired creeks and predicting bacterial exceedances. Effectiveness water quality monitoring was inconclusive; beach water improvement monitoring was not completed because work was delayed due to State budget freezes. However, a total of 23 failed septic systems that drain into the Trinidad Bay and watersheds were replaced or repaired in the Trinidad/Westhaven areas.

Recommendations

The communities of Trinidad and Westhaven will further benefit from additional water quality sampling and further repair or replacement of old and/or faulty septic systems. Due to the small size of Trinidad and the economically disadvantaged status of most of the surrounding areas, funding to continue this project is being pursued. Effectiveness monitoring is also a future priority. Though the fluorometer may still prove to be a useful tool in source tracking pollution, particularly from OWTS, there are other variables that need to be included in the analyses—in particular, rainfall and turbidity. With future funding, this can be explored further.

1.0 Introduction

The City of Trinidad and surrounding residential area of Westhaven are small, mostly rural communities encompassing a total population of around 3,000 on approximately 1,000 lots. The area sits on a series of marine terraces ranging from about 140-600 feet above sea level. Most of the ground surface has a slope of 15% or less, though stormwater runoff and groundwater drain into Trinidad Bay from steeper slopes found at sea cliffs, stream banks and the boundaries between marine terraces. The upper watershed areas are mostly commercial timberland, where the lower watersheds are residential. Trinidad Bay, rimmed by seven of the most-visited beaches in the county, is visited annually by thousands of residents and tourists. Unfortunately, high levels of bacteria indicative of fecal pollution (total coliform, fecal coliform, and *Enterococcus*) have been detected in Trinidad Bay since the water quality monitoring program began, thus diminishing the recreational value of the bay's coastline areas. Water quality within the project area is also a major concern for a number of additional reasons.

The kelp beds in Trinidad bay are designated as an Area of Special Biological Significance (ASBS) (now called a State Water Quality Protection Area (SWQPA)),by the State of California and is also designated as a Critical Coastal Area (CCA) by the California Coastal Commission. This area supports a variety of aquatic life and the kelp beds are important building blocks for a sustainable, resilient coastal environment and economy. Consequently, the State Water Board prohibits all waste discharges into these areas to protect important habitats. Adjacent beaches Luffenholtz and Trinidad State are listed as impaired water bodies under Section 303(d) of the Clean Water Act for exceedences of indicator bacterial standards (i.e., AB411 criteria) which violates the State Water Board discharge allotment.

The Trinidad-Westhaven Planning Area also supports a number of special-status species, including salmonids. The state's water quality standards set regulatory requirements for maintaining the health of lakes, rivers and marine waters and the standards that set the level of pollution that is allowed to enter waters is to keep them clean and safe for people, fish and wildlife. The ability of salmonid species to migrate upstream on the project location's creeks is currently restricted by man-made and natural barriers; however, the upper watersheds are being managed for the possibility of salmonid recovery as well as the protection of existing populations of coastal cutthroat trout, a California Species of Special Concern. Salmon, steelhead and Coho recovery is a long-term goal for ecosystem management throughout the Trinidad area as well as the greater North Coast region.

Luffenholtz Creek is the largest watershed and water supplier in the region. Domestic water supplies for all the residents within the project area come from local ground and surface water sources. Maintaining a safe and reliable water supply is and will be necessary as the region's population grows. Luffenholtz Creek flows through the project area, fed both from surface and groundwater sources, and drains directly into Trinidad Bay at Luffenholtz Beach, contributing to the beach's impaired water body status. Drinking water for the City of Trinidad comes from Luffenholtz Creek and bacterial contamination poses a threat to the health of residents who obtain drinking water from local streams and springs, and to recreational users of local beaches and bays.

Trinidad's economy also heavily relies on the recreation and tourist industry as well as the fishing industry; both industries are dependent on a healthy bay. High levels of indicator bacteria in the bay and in surrounding creeks have been well documented; however, the official source(s) are listed as unknown by the Clean Water Act listings. It has been conjectured that the

source of the bacteria are old or failing Onsite Wastewater Treatment Systems (OWTS) due to sometimes obvious problems, such as a foul order emanating from seeps and creeks on the beaches and the type of bacteria and substances found in the water.

Individual OWTS, or septic systems, are the only source of wastewater treatment in the Trinidad/Westhaven area; there is no sewer plant. Several areas are densely developed with many parcels less than one quarter acre and a majority of these parcels were created and developed prior to current regulatory standards. OWTS is one of the three factors pointed out by the SWRCB as adversely impacting the Trinidad Kelp Bed SWQPA. OWTS in this area are often unpermitted (built prior to permit requirements) or otherwise do not meet current requirements (Trinidad GIS, 2007) and well over 50% of the OWTS were found to either be unpermitted or installed pre-1970, further indicating septic as a likely contributor to the high bacteria counts.

Many of the soils have limitations that reduce the effectiveness of OWTS function, including impermeable layers, high clay or sand content and high groundwater. Trinidad and the western portions of the study area have very sandy soils that leach quickly, but rarely too quickly, for proper treatment. East of Hwy 101, clay hardpans that are not permeable enough to allow proper infiltration and treatment of wastewater are common. High groundwater that intercepts untreated wastewater is another problem in the Westhaven area. Both of these issues result in OWTS failures and malfunctions.

The City of Trinidad was an ideal location for this project because of the small size of the watershed areas and the relatively few potential sources of the bacterial contamination that can occur (OWTS, pets-including horses, and wildlife), making it easier to ascertain the source of contamination. Furthermore, only the lower portions of the watersheds are developed; the upper areas are timberland. Because of this, it is easy to compare downstream results with upstream control points to eliminate any interference of organic matter. Trinidad has completed water quality sampling that not only provides baseline water quality data, but also represents the beginning of a targeted sampling effort.

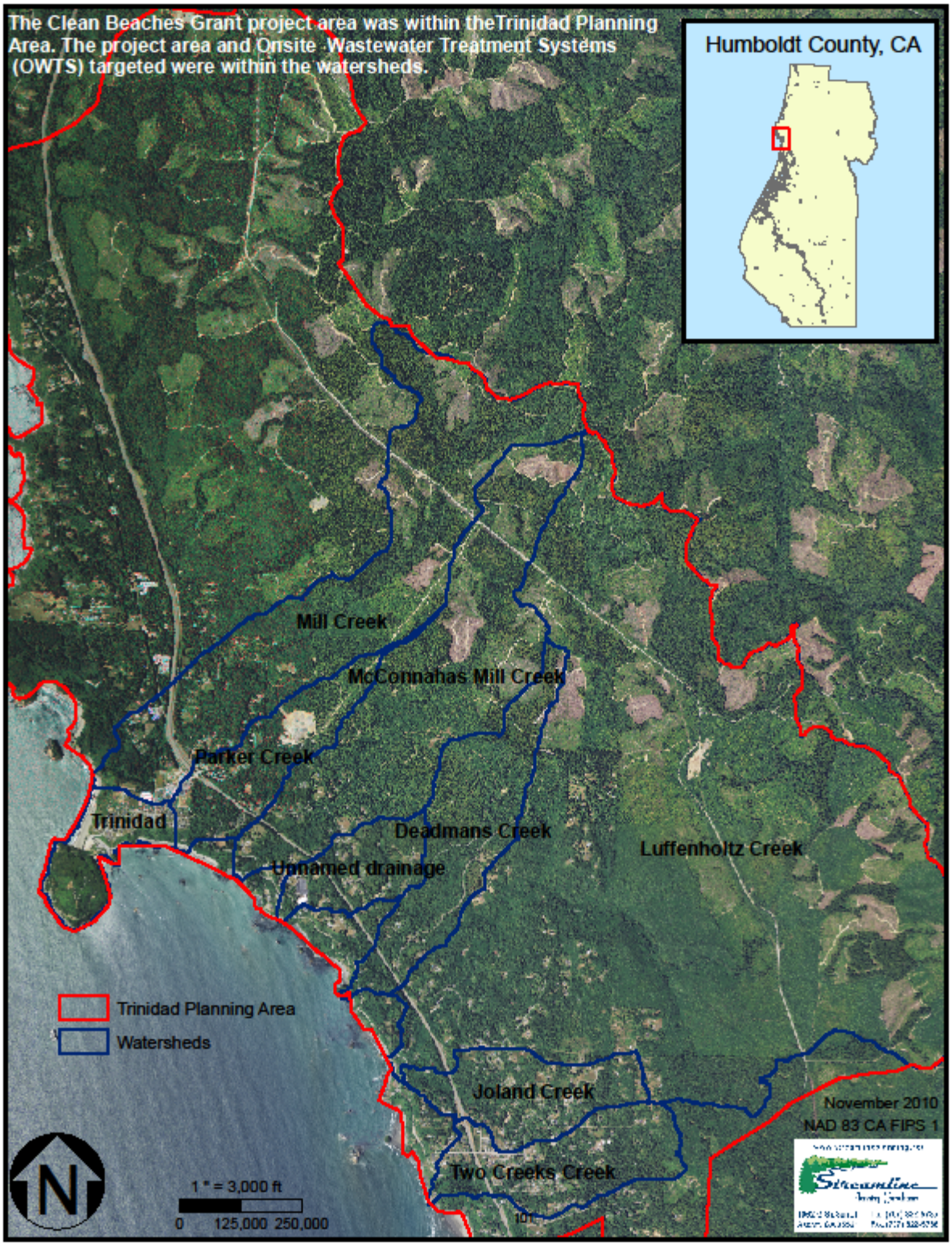

Figure 1. Map of the project location.

2.0 Project Description

2.1 Project Scope / Activities Completed

This project addresses bacterial contamination and aims to reduce bacterial levels in nearshore waters due to malfunctioning OWTS. Nearshore waters and creeks were sampled for contaminants from malfunctioning OWTS to track them back to the source. Based on downstream water quality information and data from septic permits on file, OWTS within 100 feet of a polluted waterway and unpermitted or permitted earlier than 1985 were identified. Letters were prepared to send offers for free inspections to the 75 systems identified as 'high-risk.' It was at this point that funding for the project was halted for a year due to the State budget freeze. When funding was reinstated, due to the shortened timeline, it was necessary to identify failing septic systems and have them repaired quickly without the full inspection, financial need and prioritization process that originally intended. Water quality data continued to be collected before, during and following repairs to assess if there was a reduction in anthropogenic bacteria pollution and improved water quality in and adjacent to the surf zone of targeted beaches. Unfortunately, no summer, post-construction, effectiveness monitoring was completed.

2.2 Site Description

The original planning area was defined by a Proposition 50 watershed planning grant (Integrated Coastal Watershed Management Plans) which was completed in May 2008. This planning area consisted of seven watersheds extending from Two Creeks in the south to Luffenholtz Creek (including Joland Creek), which drains over half of the plateau area, Deadman's Creek, an unnamed watershed, McConnahas Mill Creek, Parker Creek, the City of Trinidad (which includes numerous seeps on the bluffs / beaches) to Mill Creek in the north (Figs. 1 & 3). This watershed study area contains a total area of 6,498 acres and 32.7 miles of streams.

2.2.1 Geology

The watershed is characterized by a series of broad, gently sloped marine terraces separated by steep slopes that in cross-section look like wide stair-steps. Marine terraces are uplifted through tectonic activity, a process that is counterbalanced by shoreline erosion caused by wave action. Average elevation in the study area is 556 feet above sea level. The maximum elevation is 1,372 feet. Steep canyons are found along the corridors of Mill Creek, McConnahas Mill Creek, and the main stem of Luffenholtz Creek, and the creeks themselves generally have a steep longitudinal gradient. Throughout the study area the coastline is also bordered by steep bluffs 60 to 100 feet in height.

The study area is located in the Northern Coast Ranges Geologic Province. This area is underlain by a geologic unit known as the Franciscan Formation, or Franciscan Complex. These rocks originate on the sea bed, where turbid currents deposit sand, mud, gravel, and silica from the shells of marine creatures to create this formation. Over tens of millions of years, these substances accumulate and harden to form sandstone, shale, conglomerate, greenstone, and chert, known as a mélange because of its mixture of different rock types, which also vary widely in their hardness. These formations are then uplifted by seismic activity to form the terraces now seen above sea level. The Franciscan formation is characterized by blocks of resistant sedimentary and metamorphic rock within a matrix of sheared, deformed, and highly erodible

rock as a result of seismic activity that has also caused breakage and deformation. These harder rocks may form sea stacks or outcroppings of stable areas intermixed particularly with areas of shear zones within the soft clays and sandy bluffs that are considerably unstable. Erosion and slope failure are of significant concern in the watershed due to bedrock instability and wave erosion on slope toes.

Alluvial sediments, typically composed of sand, silt, and gravel, have accumulated on the terraces over time. These deposits, on which soils have developed over thousands of years, range in thickness from a few inches to more than 100 feet. The Natural Resources Conservation Service has completed soil surveys for the project area; the data has not yet been published but was made available for use by the City of Trinidad for its General Plan update and soil analysis. The most common soil type in the study area consists of the Arcata Series; other soils series that occur in the area are Timmons and Hutsinpillar. All of these series are characterized by potential septic system limitations, including high groundwater and low permeability.

Soil and bedrock permeability vary throughout the study area. Some of the soils, particularly those on the lower terrace adjacent to the ocean and within City limits have high permeability (high sand content) and low groundwater, making them ideal for leach fields. However, much of the project area has shallow bedrock and impervious clay layers that result in shallow groundwater tables and limit the septic capacity. The soils often contain layers of low or no permeability, particularly the clay layer that exists at the contact point between the bedrock and terrace deposits. In this case, water or effluent flows along one of these impervious or less-permeable layers and may “daylight” where that layer intersects the ground surface forming seeps along the bluffs and escarpments. As a result, new OWTS construction must be carefully evaluated and designed, and existing systems may be at high risk of failure or groundwater contamination.

The entire northern coast of California is subject to significant seismic activity due to a variety of faults in this area. There are several faults within the project area. The Trinidad Fault, which runs northwest through the project area has been designated as a Fault Hazard Zone under the Alquist-Priolo Act of 1972. In this zone, any new development of structures for human occupancy would be required to determine the fault rupture area and appropriate setbacks before a building permit would be issued. Most of the project area has steep bluffs along the coastline, which generally protect adjacent development from tsunamis and sea level rise, though slope erosion and bluff creep are serious issues. If earthquakes were to hit this area, a sizable increase in OWTS pollution is realistic.

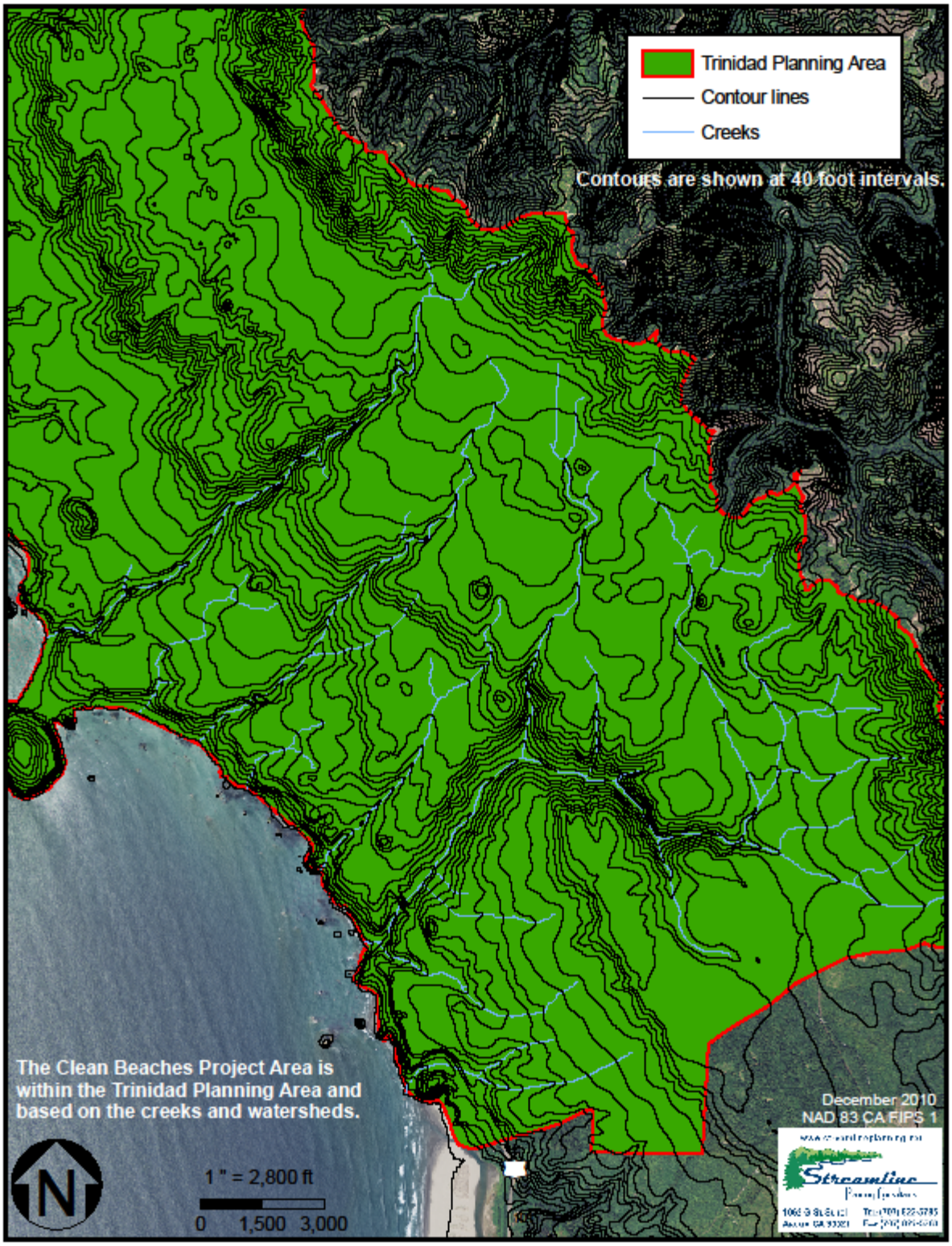

Figure 2. Topography of the Trinidad Planning Area as applicable to the Clean Beaches Grant.

Table 1. Surface elevations by watershed

Sub-watershed	Avg. elevation (ft)	Max. elevation (ft)	Avg. stream gradient (ft/mi)
Mill Creek	643	1,372	303
Parker Creek	323	708	292
Luffenholtz Creek	616	1,371	*Mainstem*: 164 *North fork*: 257
Joland Creek	378	634	341

2.2.2 Watersheds

Five different watersheds were chosen to ensure a well-rounded sample of the project area, representing each type of watershed. Mill Creek has the best water quality and is the least developed watershed. Parker Creek is small and generally accessible for its entire length, flows through the City of Trinidad, is significantly developed, and has poor water quality. Luffenholtz Creek is the largest watershed, as well as the source of the public water supply for the City of Trinidad. Finally, Joland Creek, which flows into Luffenholtz at the beach, was chosen because of its poor water quality and dense development. (Table 2.)

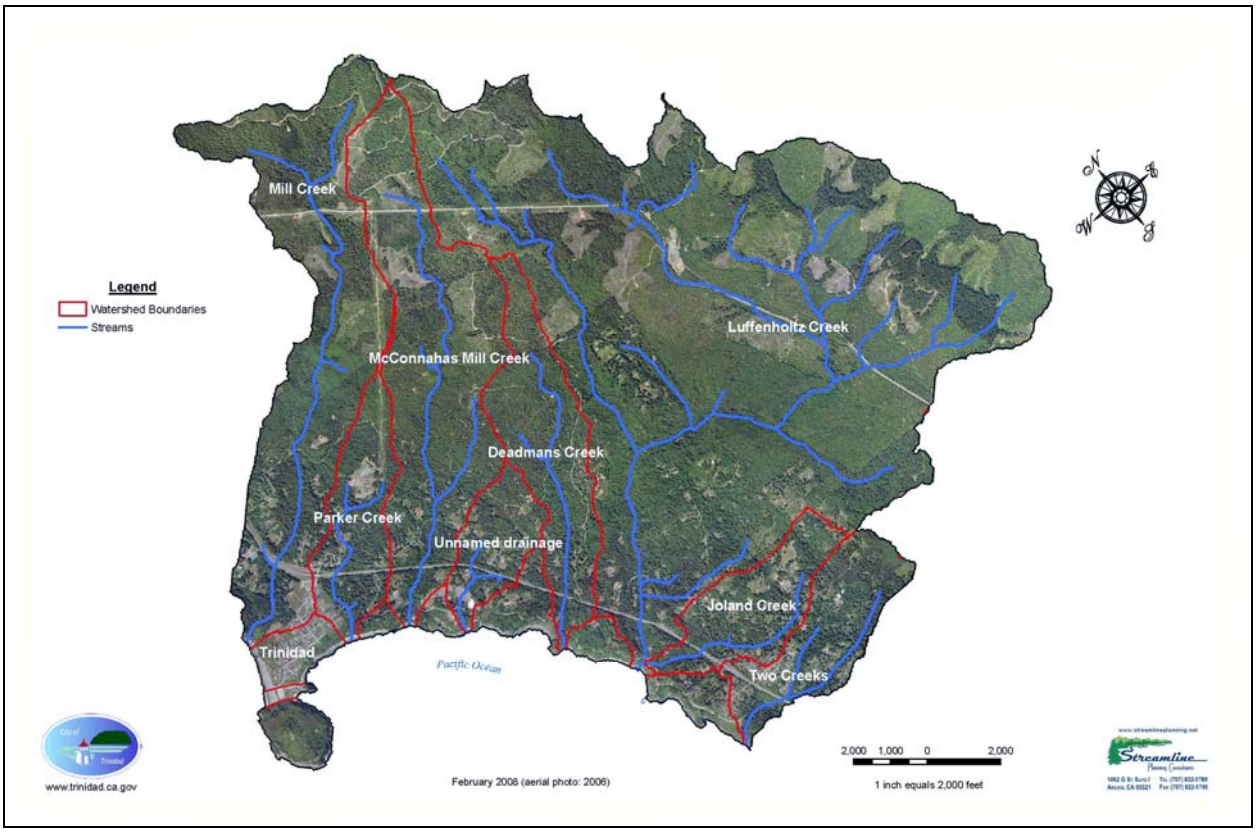

Figure 3. Watersheds of the Trinidad Area.

Table 2. Stream length by watershed.

Stream	Mainstem Length (ft)	Length of Mainstem + Tributaries (ft)	Ratio (%)
Mill Creek	17,233	21,506	0.801
Parker Creek	5,873	6,976	0.842
Luffenholtz Creek	24,719	86,321	0.286
Luffenholtz North Fork	10,484	--	NA
Joland Creek	6,185	6,380	0.969

2.2.3 Land Use

The City of Trinidad and the communities of Westhaven and Moonstone and the Trinidad Rancheria are the main urban areas within the planning area. There are approximately 1,000 residentially developed parcels in the study area, located mostly in the lower watershed areas. The upper watersheds are mainly timberland.

The study area environment includes ancient and working forests, sensitive coastal resources, marine mammal and bird rookeries, public beaches, a working Bay, and tribal lands,

including the historically significant Tsurai Indian Village site located below the ocean bluffs on the south side of the City of Trinidad. The forests of the region are some of the most productive on the planet, but water quality is a constant concern due to impacts from land management practices. Baseline water quality monitoring efforts resulting from three different grants to the City have indicated that bacterial pollution is prevalent within the project area.

The major land uses in the planning area are timber production and rural residential (Fig. 4). The Green Diamond Resources Company owns a majority of the land in the upper watersheds, including Luffenholtz Creek, which is the largest watershed in the planning area and also the City of Trinidad's domestic water supply. Much of the planning area is also made up of residential development, which is concentrated around the City of Trinidad and Westhaven; it also includes development along the coastal bluffs, along Westhaven Drive, and along Patrick's Point and Stage Coach Roads north of Trinidad. Trinidad State Beach stretches along the west shore of the City of Trinidad. There are public beaches along the coastal bluffs of Scenic Drive within the project area. All of the residences within the study area utilized OWTS to dispose of wastewater. A high percentage of these systems are old and were constructed prior to current standards or before permits were required.

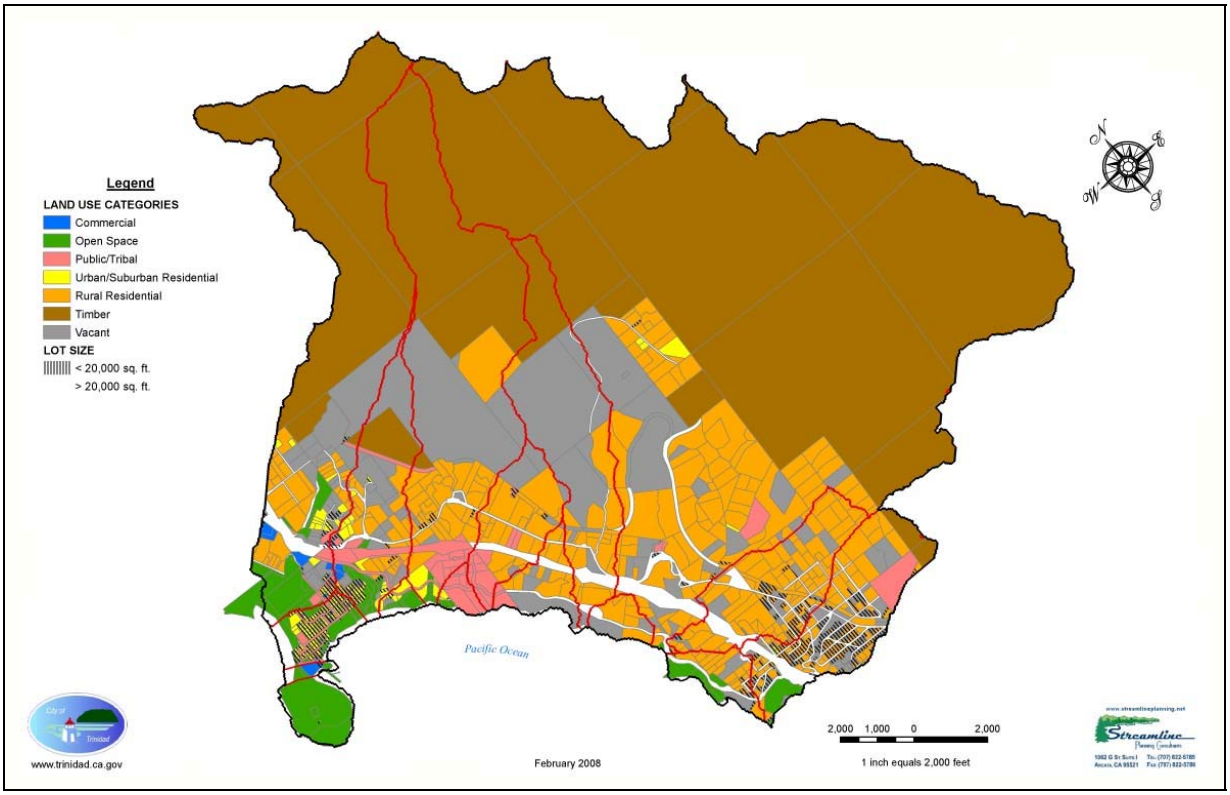

Figure 4. General land use classifications in the Trinidad Proposition 50 Planning Area.

2.3 Data Collection, Management & Analysis

2.3.1 Monitoring Design

The overarching goal of the project is to restore and protect water quality and the coastal watershed. In order to assess the effectiveness of replacing septic tanks to reduce water pollution, the City monitored the concentrations of bacteria at several locations in the project area including creeks, shoreline, seeps, and in the mixing zone at creek outfalls.

Studies have found that relative contributions from major sources of OWTS pollution were about the same during base flow and storm flow periods, indicating transport pathways may not change much with the seasons. They only found predicted, seasonal variations in bacterial contributions to be consistent with land use practices. Therefore source tracking and monitoring was carried out both during summer, low-flow periods, and during storm events when bacteria counts are generally highest.

2.3.2 Sampling Methods

Water quality monitoring stations for repeated sampling had been previously set up on two locations on each of the five different watersheds – Mill Creek, Parker Creek, Luffenholtz Creek and Joland Creek, as well as at several seeps and ocean points. The creek sampling locations were surveyed for cross-sections and flow information. Bacterial results (total coliform, fecal coliform (*E. coli*), and *Enterococcus*) were a major concern as they had showed significant exceedences of State standards for safe water contact in the past. Previous sampling efforts that included nutrients were inconclusive, and were not utilized for this project.

All bacteria samples were grab samples collected in sterile bottles using sterile sampling techniques to reduce the risk of contamination. Creek samples were taken in the center of the creek upstream of the sampler to avoid contamination. A sampling pole was used to assist in collection from the headwall. The mixing zone samples were collected according to DEH protocols, calling for collection in ankle to knee depth on an incoming wave.

The bacteria tested were total coliform, *E. coli* and *Enterococcus*. However, it is known that organic matter and turbidity can affect the fluorescence readings; therefore turbidity readings were taken using the same fluorometer for approximately half the samples (turbidity was not taken for the first half due to an oversight). In addition, daily rainfall was also collected from records at the City's water plant. Categories for rainfall in the past day, three days and seven days were included in the statistical data. Each sample was given a unique identifying combination of numbers and letters indicating from which watershed the sample was taken.

A fluorometer was used to detect the presence of optical brighteners (OBs) in order to confirm and track OWTS pollution within the greater Trinidad area. OBs, or fluorescent whitening agents, are organic compounds that are added to most laundry detergents, in some handwashing and dishwashing detergents and in most toilet paper—all products filtered by an OWTS. Generally, concentrations range from 0.02% to 0.15%. A portion of these OBs remain absorbed in fabrics in the wash (20-95%), but the remainder is discharged to the waste water. Because OBs are readily absorbed by particles, including soil, a properly functioning septic system should remove nearly 100% of any OBs discharged to the system. If the system discharges them into the environment, it should be noted that OBs do not readily biodegrade unless they are exposed to sunlight. Therefore if they are present, it should only be in raw,

untreated, residential wastewater, not in the effluent from a properly functioning OWTS. This makes them a good indicator of septic pollution.

Trinidad's creeks are generally well vegetated, reducing the potential for degradation of OBs from degrading UV exposure, however, tannins and lignins (humic and fluvic acids) are a natural source of fluorescence, as is chlorophyll, so coarse organic material that falls into the creeks from the riparian edges may also naturally fluoresce. Because OBs degrade quickly, and the other substances do not, studies have found that if there was >15% drop in the fluorometer reading after a 5-minute exposure to UV light in the fluorescence, then OBs were likely present (97% correctly identified). Therefore, a second OB reading was taken and the difference between the two was calculated to account for the organic matter and tannins.

Fluorescence is the indicator used to expose concentrations of OBs. Measurements were taken according to the manufacturer's instructions provided with the fluorometer (an *Aquaflor*) and recorded in a field notebook. Samples were run using the same cuvette that the fluorometer was calibrated with. A small mark was made near the top so that the cuvette was always positioned facing the same direction for each reading. These two safeguards ensured that any scratches or other blemishes on the cuvette did not affect relative readings between samples. The readings taken with the fluorometer came from the same bacterial grab samples that were taken to the lab for analysis and the cuvette was wiped clean and dry prior to each sample reading.

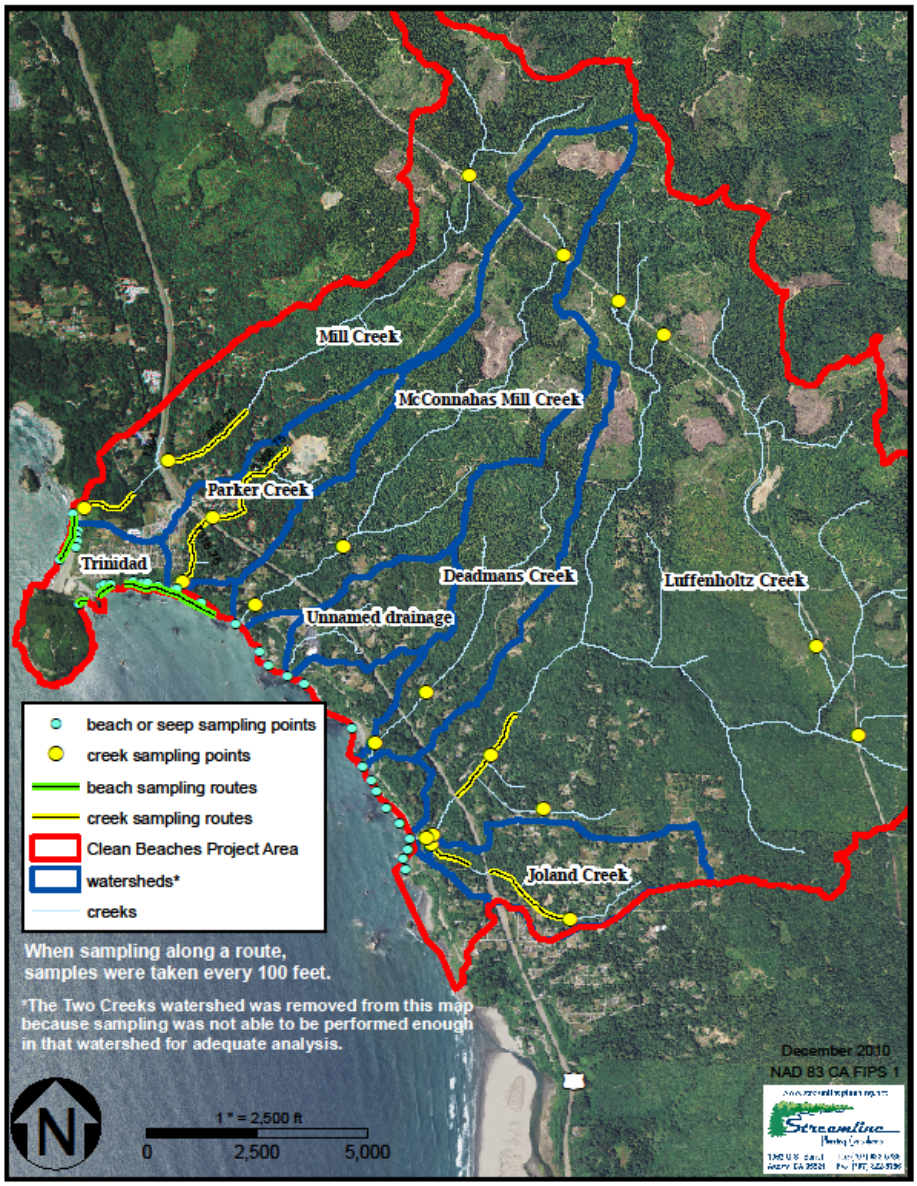

Figure 5. Sampling points in the project area.

2.3.3 Analysis

Data was recorded in the field in a field notebook. Field conditions such as time and weather were recorded along with the sample data. This data was then transferred into a Statistical Package NCSS Software spreadsheet and backed up in an Excel file. Data recorded was as follows: sample point identification, watershed, date, optical brightener first reading, optical brightener second reading, coliform, *E. coli*, *Enterococcus*, turbidity, rainfall in the past 24 hours, rainfall in the past three days and rainfall in the past week.

Water quality data was faxed and mailed from the laboratory to minimize data loss. This and other data were also entered into a spreadsheet and analyses were performed using the NCSS and Microsoft Excel 2003. Watershed and date were numerically coded. Variables were added to each bacteria result to indicate whether the number exceeded the State standards for contact

recreation. In addition, a ratio between coliform and *E. coli* was calculated since it is another bacterial water quality standard used by the SWRCB. When calculating the most probable number, only a portion of the sample is used and the lab can not definitely rule out the presence of bacteria even with a negative reading. Therefore, the lab reports the results as <1 if there was no dilution and <10 if there was a dilution. In these cases, the data was recorded as a '1' for use in the various analyses. Similarly, if the bacteria counts were above a certain number (24,192 for a 1:10 dilution), the lab reported them as 'greater than' and the number was recorded in the data as '25,000' for statistical analysis purposes.

Fluorescence readings, in conjunction with bacterial sampling and measurements of turbidity, were used for correlation/comparison. The relationships between parcel and land use data and bacteria and OBs were evaluated as a source tracking tool both to confirm anthropogenic sources of bacterial pollution and to identify and prioritize sub-watersheds/neighborhoods contributing the greatest amount of anthropogenic bacterial pollution.

ArcGIS was used for the geographic analyses and map creation using data from OWTS permits, land use, water quality, terrain, etc. to assess non- or malfunctioning OWTS in critical areas.

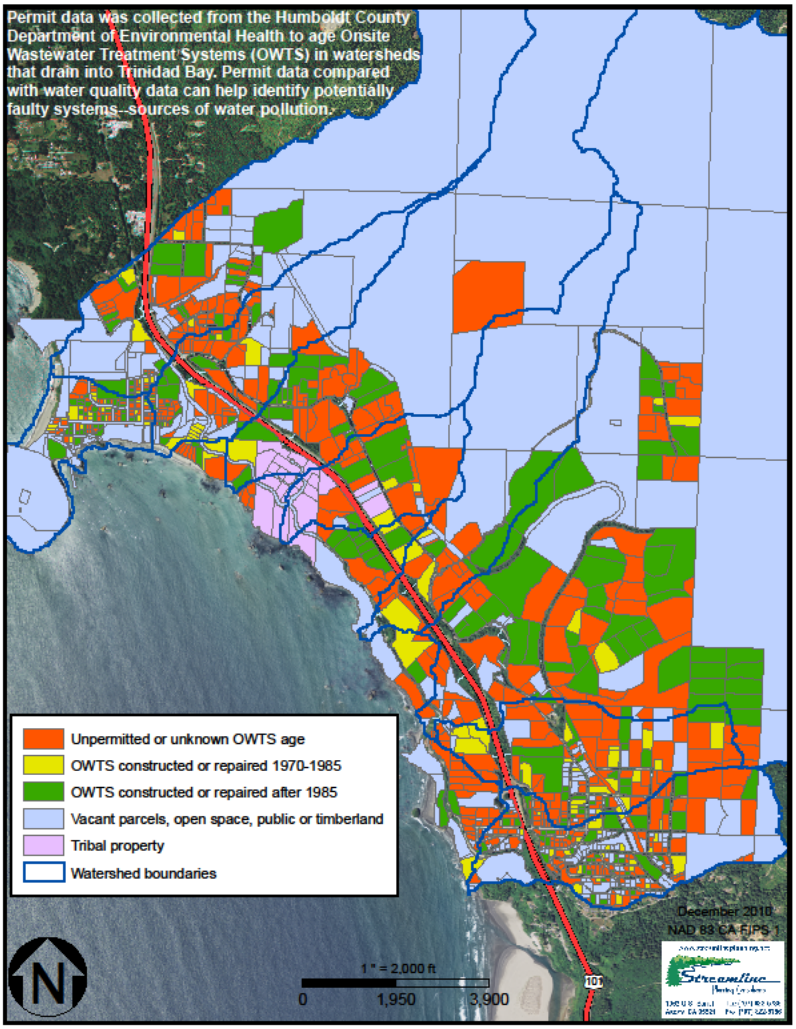

Figure 6. OWTS permit data.

2.4 Parties Involved

The City of Trinidad provided the resources for the administration, data collection and analyses. Humboldt County Department of Public Health granted access to OWTS permit information and performed bacterial tests and OWTS inspections. Steve's Septic inspected some of the OWTS. Four qualified local contractors were chosen by property owners to conduct the system repairs and replacements – Marvin Manor, Trumble's Backhoe Service, Leach Water Systems and Wes Green Landscaping.

3.0 Performance Measures

3.1 Project Goals

3.1.1 Project Schedule

The following table shows the projected and actual schedule for the project. Due to the State of California budget freezes and other delays, the actual submission dates vary from projected submission dates.

Table 3. Project Timeline (Projected v. Actual)

Activity	Projected Submission Date	Actual Submittal Date
SCOPE OF WORK	**(mm/dd/yy)**	**(mm/dd/yy)**
A.1 GPS Information / Shapefile	Day 90 (with 1st Invoice)	4/18/2008
A.2 PAEP	10/2007	10/26/2007
A.3 Monitoring Plan	Day 90	7/11/2008
A.4 Quality Assurance Plan	Day 90	7/11/2008
A.5 CEQA	10/2007	10/26/2007
A.6 Landowner Agreements	NA	NA
A.7 Permits	As needed	10/20/10 (supplemental)
B.1.0 Baseline Monitoring & Source Tracking		
B.1.1 AB411 Trinidad Bay Beach Monitoring	NA	NA
B.1.2 Surf Zone Baseline & Effectiveness Monitoring	NA	NA
B.1.3 Bacterial Source Tracking	NA	NA
B.1.4 Optical Brightener Source Tracking	NA	NA

B.1.5 Discharge Measurements	NA	NA

Table 3 Cont. Project Timeline (Projected v. Actual)

Activity	Projected Submission Date	Actual Submittal Date
B.1.6 Shallow Monitoring Wells	NA	NA
B.1.7 Analysis of Results using GIS and Statistics	04/2008	10/20/2010
B.2.0 OWTS Permit Assessments		
B.2.1 Research & Copy DEH Files	NA	NA
B.2.2 Initiate OWTS Program in Trinidad; *submit ordinance to Grant Manager*	07/2008	1/19/2009
B.2.3 Contact property owners in problem areas and offer education and OWTS Improvements	NA	NA
B.3.0 OWTS Improvements		
B.3.1 OWTS Inspections	NA	NA
B.3.2 Inspection Forms / Household Surveys	Quarterly	10/20/2010
B.3.3 Install Risers & In-line Filters	NA	NA
B.3.4 Asses OWTS for repairs / replacement	NA	NA
B.3.5 Contract Development for construction	NA	NA
B.3.6 Construction of OWTS Improvements	NA	NA
B.3.7 Final Inspections	NA	NA
B.4.0 Methodology / Project Demonstration		
B.4.1 Assess program through statistical analysis and peer review	NA	NA
B.4.2 Suggest Alternatives	NA	NA
B.4.3 Present Results (Journals, Newsletters, and / or Conference Materials)	12/2009	10/20/2010

INVOICING, BUDGET, REPORTING		
A. Invoices	Quarterly	Quarterly

Table 3 Cont. Project Timeline (Projected v. Actual)

Activity	Projected Submission Date	Actual Submittal Date
Reports		
1. Grant Summary Form	Day 90 (with 1st Invoice)	10/17/2008
2. Progress Reports	Quarterly	7/20/2010
2a. Annual Progress Summary	Annually	10/17/2008
3. NRPI Project Survey Form	Before Final Invoice	
4. Draft Project Report	11/1/2010	11/13/2010
5. Final Project Report	12/1/2010	12/13/2010

3.2 Project Tasks & Outcomes

3.2.1 Plans & Compliance Requirements

- Goal 1: Collect global positioning system (GPS) information for project site and monitoring locations
    - Outcome 1.1: Identify and define project site

      Since this project is a follow-up implementation project based on previous planning efforts, the project area and some monitoring locations were already in the GIS database. It is difficult to get good GPS readings within the project area due to the high canopy cover. The watershed boundaries were generated with the GIS based on the Digital Elevation Model. Sampling points were documented with a GPS and then placed in more accurate locations based on ortho-rectified aerial photography. For this task, the GIS data was updated in accordance with the guidelines provided and the proper metadata documentation for submittal.

- Goal 2: Prepare and implement a Project Assessment and Evaluation Plan (PAEP)
    - Outcome 2.1: Confirm OWTS status within priority areas

      This task was completed and submitted as part of the grant contract development.

- Goal 3: Prepare, maintain, and implement a Monitoring Plan (MP)

- Outcome 3.1: Identify and describe monitoring objectives, types of constituents to be monitored, and the sampling location frequency / schedule for the monitoring activities
  - Target 3.1: Statistically significant data results
  - Target 3.2: Broad acceptance of identified priority areas within stakeholder groups

  The final draft MP was submitted and approved early in the grant implementation in July 2008.

- Goal 4: Prepare, maintain and implement a Quality Assurance Project Plan (QAPP)
  - Outcome 4.1: Prepare plan in accordance with the State Water Board's Surface Water Ambient Monitoring Program's (SWAMP) QAPP and data reporting requirements, and the USEPA QAPP, EPA AQ/R5, 3/01

    The final draft was submitted and approved in July 2008.

- Goal 5: California Environmental Quality Act (CEQA) Compliance prior to beginning work on project
  - Outcome 5.1: CEQA compliance must be completed prior to work

    The project and its elements are exempt from CEQA and a categorical exemption was filed on 10/26/2007.

- Goal 6: Any necessary permits must be submitted to Grant Manager before work begins

  The only necessary permits were from the Humboldt County Division of Environmental Health for each of the OWTS major repairs. All permits were submitted as they were received, and all were documented before any work commenced.

3.2.2 Baseline & Source Track Monitoring

- Goal 1: Collect sufficient baseline and source tracking data at the correct locations and times
  - Outcome 1.1: Baseline data isolates problem areas and times

    Samples were collected beginning in September 2008 and continued until the end of project funding in November 2010. Four beach monitoring locations were selected to be sampled after construction. Baseline data was collected at monitoring locations 1, 3 and 4 in over 13 sampling events (Table 5) and bacteria data collected prior to the onset of the project was included in parts of the analysis. OB source tracking was performed at select contributor streams, seeps and storm drains in the Project area using a handheld fluorometer. Discharge

measurements for low-flow conditions were taken at creeks used for source tracking. Discharge measurements were also during storm events.

Outcome 1.2: Quality and amount of baseline data is adequate to show project effectiveness

- Target 1.1: Clearly defined problem areas or hot spots
- Target 1.2: Broad acceptance of data quality, quantity and adequacy
- Target 1.3: Significant statistical relationships between data parameters

Analysis of the results was performed with GIS and statistics. The bacterial results (total coliform, fecal coliform (*E. coli*), and *Enterococcus*) in particular were a major concern as they show significant exceedences of State standards for safe water contact. Bacterial results are shown in Figure 6; note that exceedences are occasionally up to 65 times the allowable standard.

(1.1) Baseline sampling identified Parker Creek and Joland Creek to have the poorest water quality as expected. However, because Luffenholtz has such greater flows than the other creeks, it is the watershed contributing the most bacterial pollution to the ocean. (1.2) Sampling occurred in accordance with accepted SOPs and the approved QAPP / MP. (1.3) Though the study did not find significant direct correlations between fluorescence and bacteria, other, more complex relationships were identified, particularly between bacteria and rainfall. There is promise of being able to use a fluorometer along with turbidity and rainfall to predict whether bacterial exceedences will occur and to identify specific seeps and tributaries in creeks that are contributing the most pollution. In addition, a large dataset was created of water quality data within the project area that spans a variety of conditions that will serve well for future effectiveness monitoring and other comparisons.

- Goal 2: Conduct source tracking assessment
  - Outcome 2.1: Identify and prioritize sub-watersheds / neighborhoods contributing the greatest amount of anthropogenic bacterial pollution
    - Target 2.1: Statistically significant data results
    - Target 2.2: Broad acceptance of identified priority areas within stakeholder groups

Bacterial sampling results were input into GIS with OWTS permit information to identify which watersheds showed the greatest amount of anthropogenic bacterial pollution. These results were shared with the Trinidad City Council in November 2010. Also see the discussion and response above.

- Goal 3: Conduct OWTS permit assessment
  - Outcome 3.1: Confirm OWTS status within priority areas
    - Target 3.1: High agreement / correlation between priority areas identified through water quality sampling and confirmed with OWTS records, soil / geologic and monitoring well records

Files from the County Division of Environmental Health were researched for permit information on existing OWTS for watersheds in the planning area not already completed. This OWTS construction, repair, and unpermitted data (or lack thereof) was input into the GIS, analyzed with the bacterial results and produced priority watershed areas. Within the entire planning area, more than half the OWTS have a status of 'unknown,' which means they were installed prior to permit requirements (about 1970) or otherwise without permits (illegally). However, some watersheds have much higher percentages than others. In particular, Parker Creek stood out with 83% of the systems with the unknown status. It also has the smallest average lot size, and a high percentage of impervious surfaces. It was therefore not surprising that Parker Creek also had the highest bacteria counts. The permit data is shown in Figure 5. The greatest correlation with the bacterial data was actually rainfall and lot size. A significant amount of variability was found in the data. The analysis is further described in the fluorometer study that was also part of this project.

The monitoring wells that were proposed to be installed as part of this task were eliminated due to time constraints from the grant funding freeze. As explained earlier, selection of failed systems and repairs had to be pushed ahead without following the full prioritization process originally envisioned, including the monitoring wells.

Another part of this task included the adoption and implementation of an OWTS Management Program within the City of Trinidad. The management and maintenance program that was developed is based on examples of programs elsewhere in California, but is unique to Trinidad and will serve as an example of responsible OWTS management. The ordinance framework was adopted by the City Council in December 2008, and then amended to make it more manageable in August 2010. In November 2010, the City Council adopted a set of detailed Guidelines that will be used to implement the OWTS ordinance. It will be a difficult transition for some people due to up-front and deferred maintenance costs. Therefore, the City is working on another public education effort to get property owners in support of the program. The City is committed to the OWTS Management Program in order to protect water quality, the environment, property values and the local economy, and the program will carry on after the grant period is over.

3.2.3 Education, Outreach and Capacity Building

- Goal 4: Demonstrate the effectiveness of a relatively new, inexpensive and quick source tracking method of identifying and locating human sources of bacterial pollution.
    - Outcome 4.1: Project goals are met
    - Outcome 4.2: Project results in feasible method to reduce human-induced bacteria in Trinidad and Westhaven
    - Outcome 4.3: Method is peer review and accepted
    - Outcome 4.4: Results are presented and made available to interested parties
        - Target 4.1: 100% of goals are met
        - Target 4.2: 100% of project completed within timeframe and budget

- Target 4.3: Publication in one peer-reviewed journal, one water resources newsletter and presentation at one conference or meeting

Statistical analyses have been completed to determine the relationship between fluorescence readings and bacteria counts. Other data being utilized in the analyses include watershed, date of sample, turbidity and rainfall. The results have showed that optical brighteners, in conjunction with rainfall and turbidity, can be used to predict exceedances of bacterial standards within individual watersheds. The results can also be used to identify seeps, tributaries and other discharges into creeks that are contributing the greatest amount of pollution. The data will be useful in refining the method for futures studies and is the baseline for several recommendations.

This information was outlined in the first draft of a thesis prepared on this study and submitted to the Master's Candidate's Committee of watershed management, wastewater education and industry peers for review in October 2010. Edits and comments since then have been incorporated, and a second draft will be turned in early 2011. The projected presentation and adoption date of the project report is May 2011; the thesis will be finished without funding from this grant due to the contract period ending, but will be submitted to the Grant Manager when accepted. In addition, an article outlining the findings of the study was submitted to the Watershed Science Bulletin for publishing consideration in the spring issue, but was not accepted. An abstract was also submitted for the 2011 Redwood Symposium for oral presentation. Finally, an overview of the results was also presented to the Trinidad City Council at a public meeting in November 2010.

3.2.4 Load Reduction Activities

- Goal 5: Identify and fix a non-functioning individual OWTS that may be contributing to anthropogenic bacteriological indicator levels at the beach.
    - Outcome 5.1: Inspection / improvement program encourages property owner responsibility for OWTS and voluntary cooperation
    - Outcome 5.2: Inspections, risers and in-line filters reduce the risk of failed or malfunctioning OWTS
    - Outcome 5.3: Repair or upgrade of the OWTS contributing the most bacterial pollution
        - Target 5.1: Inspect approximately 80 OWTS in the identified priority areas
        - Target 5.2: Install risers and in-line filters on approximately 80 OWTS within the identified priority areas
        - Target 5.3: Fix (repair or upgrade) 10 or more of the worst contributing OWTS

Originally, seventy-five systems were identified as high-priority based on water quality data, distance to creeks, permit status and lot size. Letters were prepared to send out to these property owners, and just before they were mailed, this grant was frozen. It was reinstated approximately one year later, but staff

could not immediate pick up where they left off due to other current projects and obligations, including a General Plan update. Also, the contract had to be amended to reflect a new schedule; however, the full requested extension could not be granted. By the time work was resumed, there were only six months left on the grant contract. Therefore, in order to have time to identify and repair failed systems by October, staff had to take a more direct approach. Failing systems were identified via word-of-mouth, through DEH and local qualified contractors. Property owners were required to submit an application and meet minimum requirements (such as having a failed system qualify for a DEH repair permit). Systems were fixed in order of priority based on several factors.

Each of the systems was inspected for their functionality, though not all used the City's inspection forms. The inspections resulted in 23 failing systems being repaired, upgraded or replaced. Contracts between the City and qualified contractors were developed and modeled after the City's standard contract format to authorize construction of OWTS repairs. Each property owner had to obtain a repair permit from DEH and notarize and record a hold harmless and maintenance agreement which stated they would maintain the system as recommended by the installer for a minimum of 20 years. Final inspections were performed at the end of construction/repair and signed off by DEH. Most property owners provided some kind of cost-share, generally paying at least the permit costs and up to half the system repair costs. A few stated that they could not afford any amount and were provided with 100% of the costs.

A budget amendment was made to remove some funds from the 'consultant' line item to the 'construction' line item to provide additional funding for repairs. This occurred because the effectiveness monitoring was not going to be completed. An amount in the budget remained, but would not cover a complete system repair. Therefore, 35 properties within the City that did not have file information for their OWTS were sent letters offering free inspections. Only 8 took up the offer, which helped defray some of their costs in complying with the City's OWTS Management Program. Of the 23 failed OWTS that were repaired, about half of the systems were directly adjacent to a tributary or creek feeding into the bay (Fig. 7). Of these, some were in shocking states of disrepair. One "system" was a pipe that ran into an old redwood box that had collapsed—essentially bearing no treatment at all. The effluent was emptying out of the house onto the property, which was high groundwater (wetland), and draining into the creek. Another system was merely an open pit with no lid—this was a hazard to animals; they were falling into it and dying. Two systems were located on a bluff above the bay, and one of the leach fields was only 20 feet from the edge. Overall, fewer systems were inspected than originally intended, but more systems were repaired, which was desperately needed, and that should result in even greater water quality improvements.

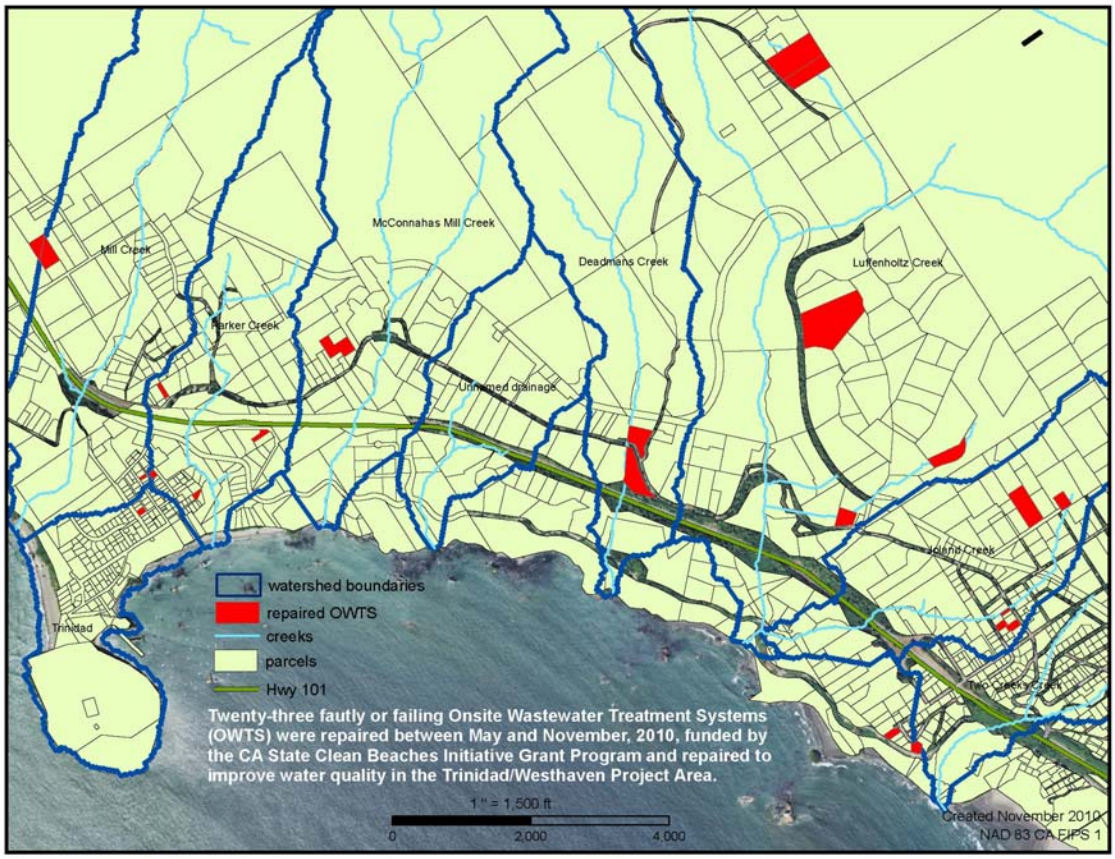

Figure 7. Parcels with faulty OWTS that were repaired or constructed through the Clean Beaches Grant.

- Goal 6: Reduce anthropogenic bacteria pollution and improve water quality in and adjacent to the surf zone of targeted beaches.
    - Outcome 6.1: Surf zone monitoring indicates no anthropogenic water quality exceedences for bacteria
    - Outcome 6.2: AB411 surf zone monitoring indicates less than 4% exceedences
    - Outcome 6.3: Optical brightener monitoring indicates that bacteria present can mostly be attributed to non-human (wildlife or pets) sources
        - Target 6.1: Attainment of water quality goals for bacteria in the surf zone
        - Target 6.2: Significant reductions in bacteria loading from OWTS sources discharging to the surf zone
        - Target 6.3: Reduction of OB reading by 20% in impacted watersheds

Although these outcomes still remain the eventual goal, they may have been unrealistic. With the number of malfunctioning, old, undersized and failing systems that appear to be within the project area, fixing 10 or even 20 will not eliminate all the bacterial pollution. In addition, with the significant variability in bacteria counts, even over short distances and timeframes, it will be difficult to detect measurable improvements in water quality.

Surf zone monitoring did not occur post-construction. Monitoring occurred during construction, but there were no monitoring events in the surf zone after all grant-funded repairs and construction were completed. Surf zone readings did have some exceedences during construction, however two different events that exceeded readings after construction began were resampled and either no longer exceeded the standards or did so at a very small percentage. *Enterococcus* was the bacterium that still exceeded standards upon resampling, which is the hardest bacteria to correlate with OWTS, as it is commonly found in the gut of humans and animals.

The existing data is too skewed to be conclusive. Most of the sample readings are very low, but some, particularly after a rainfall event, are extremely high. Monitoring took place every month, but the in-depth monitoring (walking up the creeks or along the beaches taking samples every 100 ft.) was sporadic. Rain events also took a toll on the data's consistency as the high bacteria loads produced distort the data. Dry and wet samples can be compared within each dataset, but not between.

There is no evidence that the bacterial loads decreased following OWTS repairs and construction. Due to State funding freezes, the post construction monitoring did not occur. The City of Trinidad is going to monitor surf zones in the next dry season, but the extent of monitoring is dictated by the budget and available funding. In addition, there are two beaches – Luffenholtz and Trinidad State – that the County monitors regularly in accordance with AB411, and it is assumed that it will continue next summer. The County also monitors in the winter as funding is available.

- Goal 7: Identify and address anthropogenic sources of bacteria pollution (OWTS), thereby demonstrating a source tracking methodology that can be used to help protect beneficial uses Statewide.
    - Outcome 7.1: Project results in feasible method to reduce human-induced bacteria in Trinidad and Westhaven
    - Outcome 7.2: Sub-watersheds / neighborhoods contributing the highest amounts of pollutants are identified
    - Outcome 7.3: OWTS are inspected and improved and malfunctioning systems are identified and fixed
    - Outcome 7.4: Surf zone monitoring indicates immediate reductions in anthropogenic bacterial contamination
    - Outcome 7.5: Reduction in optical brightener concentrations indicates that bacteria present can mostly be attributed to non-human (wildlife) sources
        - Target 7.1: Final report detailing success of the new methodology

This project investigated using a fluorometer as a method to assess bacteria in the watersheds. Statistical analyses determined that there were inconsistent direct relationships between fluorescence readings and bacteria counts. Other data was analyzed including watershed, date of sample, turbidity and rainfall—demonstrating that the project has many variables that must be taken into account before conclusive results can be made. There is so much

variability in bacteria counts in relation to other water quality parameters that it is difficult to find definite relationships with regard to fluorometry.

However, combining permit information, fluorescence levels, rainfall and bacteria readings from different river points allowed for the identification of priority watersheds—those with the most OWTS risk. Following GIS analyses, it appeared that the strongest relationship found was between bacteria load and parcel density, indicating that the watersheds with the highest bacteria loads also had the most OWTS.

Statistical analysis of water quality data showed definite patterns among and between the different watersheds, generally confirming expected results. It appears that optical brighteners, in conjunction with turbidity and rainfall, can be used to predict bacterial numbers, or accurately classify exceedances within individual watersheds. When data was graphed in transects along a stream, spikes in pollutants from discharges into the creeks were identified.

The highest risk OWTS were identified and repaired or replaced May through November 2010. The prior condition of the replaced systems clearly indicate that they were substantial pollution sources – often very near creeks or within high groundwater tables. Some had no leach fields (pit systems) or effective treatment. Even if water quality improvement was not detected, logically, there must be less pollution entering the ecosystem and coastal waters. A lack of measureable water quality improvement may indicate the large scope of the problem and the high number of inadequate OWTS compared to the relatively few that were fixed. There are also sources of bacteria in the surface waters not resulting from OWTS, including pets and wildlife. Surf zone monitoring during construction did indicate a reduction in anthropogenic bacteria contamination in some months, but again, variability of the data and outside elements and the extremely limited amount of sampling that occurred post-construction due to funding freezes does not elicit conclusive results.

3.3 Management Measures Implemented

This project addressed Management Measures 3.3A Existing Development, Task 1; 3.4A New OWTS; 3.4B Operating OWTS; and 3.6A Pollution Prevention Education/Outreach. In the Existing Development Measure, the identification of priority and local watershed pollutant reduction opportunities was met. This was followed by the location, design, installation and inspection of OWTS to prevent and reduce the discharge of pollutants into groundwater (Measure 3.4B). Through Measures 3.4B and 3.6A, the City of Trinidad completed and adopted an OWTS Ordinance for continued management of OWTS and public health. The purpose of the ordinance is to assure all OWTS in Trinidad are properly operated, regularly inspected, routinely maintained and monitored to prevent poorly functioning or failed systems. This establishes a basis for an OWTS Management Program that will supplement the Ordinance with specific policies and implementation measures.

OWTS Guidelines and Definitions were adopted by the City Council on October 13, 2010. An amendment to the City's OWTS Ordinance requires the City Council to adopt implantation guidelines instead of the Planning Commission and the Council is now reviewing those guidelines. Through public education and implementation of the Management Program,

continued attention given to the maintenance of OWTS enhances and validates the work completed as part of this grant.

4.0 Results

4.1 Post-Construction Data

4.1.1 Comprehensive Water Quality Data

Staff performed water quality monitoring of the surf zones at four different priority beaches (Trinidad State, Launcher, Old Home Beach and Luffenholtz Beaches) for a comprehensive evaluation of the water quality before and after the construction phase of the project. There were varying degrees of bacteria detected in the surf zones. Samples were taken starting on September 17, 2008 through December 2010. These dates included a lot of seasonal variation and flow conditions. Samples were taken from five different watersheds: beach/seeps and Mill, Parker, Luffenholtz and Joland creeks. Averages and ranges by date are presented in Table 5. Resultant bacterial data are visually presented in Figure 8.

4.1.2 Bacteria Data

Data for fecal indicator bacteria was collected after construction or repair of OWTS in order to support goals 6 and 7 of the Load Reduction Activities:

Goal 6: Reduce anthropogenic bacteria pollution and improve water quality in and adjacent to the surf zone of targeted beaches.

Goal 7: Identify and address anthropogenic sources of bacteria pollution (OWTS), thereby demonstrating a source tracking methodology that can be used to help protect beneficial uses Statewide

Once construction or repair of septic systems started in May 2010, surf samples were collected to monitor the process. There were no surf samples taken post construction.

Table 4. Averages of bacteria loads collected during comparable months before and during the construction phase.

	coliform	***E. coli***	***Enterococcus***
June-November 2010	382.87	49.92	192.39
June-November 2009	208.44	65.69	176.13

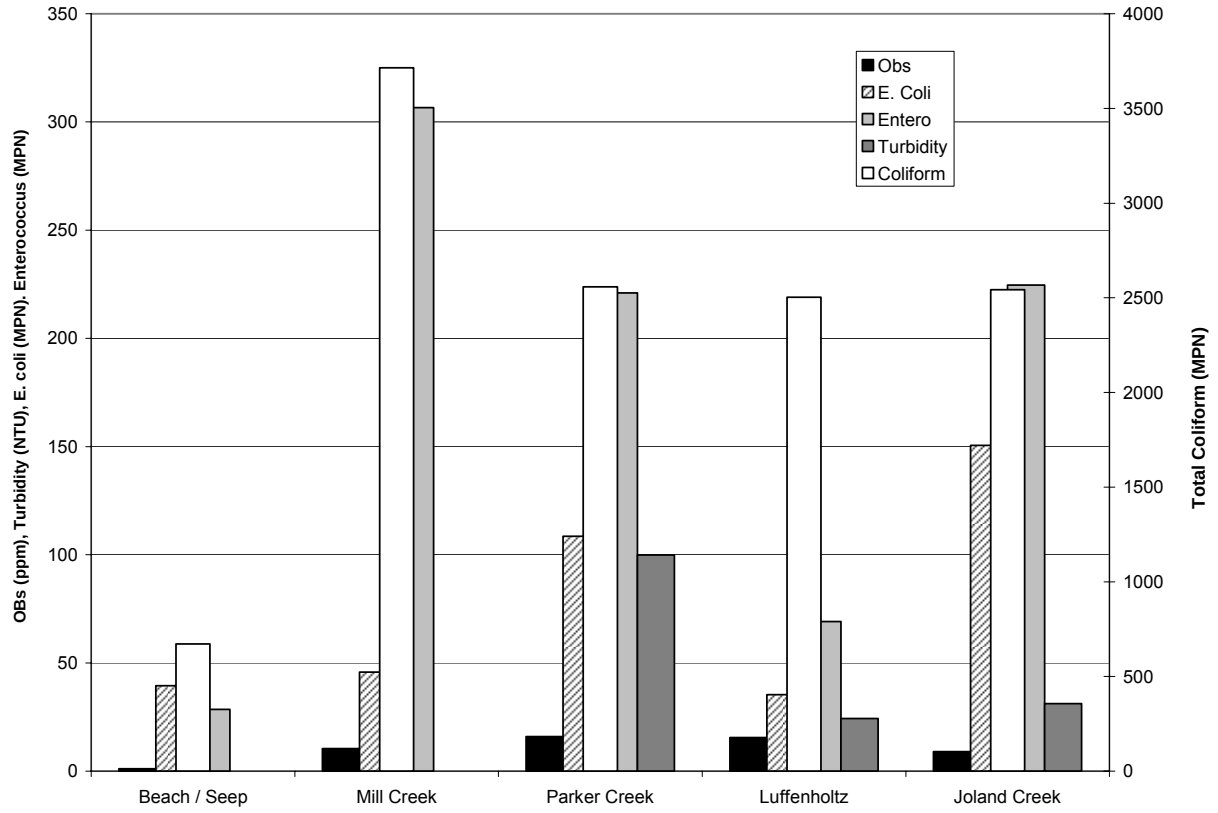

Figure 8. Averages of optical brightener, bacteria, and turbidity readings taken and displayed by watershed.

Table 5 - Average sample data by date.

Date	OBs	Coliform	E. Coli	Entero	Turbid-ity	Rain-fall 1	Rain-fall 2
09/17/08 (Beach / Seep)	1.33	55.71	3.71	2.29	NA	0	0
09/25/08 (Beach / Seep)	1.16	4.75	1.00	1.00	NA	0	0
09/30/08 (Beach / Seep)	0.90	1314.73	76.67	55.53	NA	0	0
10/14/08 (Mill)	6.53	329.00	1	NA	NA	0	0
10/14/08 (Luffenholtz)	6.27	761	23.25	1	NA	0	0
10/14/08 (Joland)	12.18	2247	20	NA	NA	0	0
11/17/08 (Mill)	10.6	466.38	9.69	4.08	NA	0	0
11/20/08 (Mill)	14.83	12177.40	148.60	1045.07	NA	0.4	0.4
11/24/08 (Mill)	8.1.	549.67	5.11	19.33	NA	0	0.2
12/01/08 (Mill)	7.92	417.67	4.67	2.87	NA	0	0
12/11/08 (Parker)	7.52	2146.80	12.20	4.60	NA	0	0
12/18/08 (Parker)	15.35	7851.75	325.38	846.88	NA	0.2	0.7
02/19/09 (Parker)	19.41	618.82	9.82	20.36	33.80	0	0.3
03/03/09 (Parker)	22.47	2400.44	168.78	240.44	188.81	0.8	1.4
04/09/09 (Luffenholtz)	12.49	934.00	52.00	121.00	26.80	0.3	0.3
05/05/09 (Luffenholtz)	24.85	4653.33	49.00	87.83	23.64	2.2	2.8
03/24/10 (Luffenholtz)	3.90	314.50	10.50	21.00	10.34	0	0.1
03/24/10 (Joland)	8.09	638.58	4.83	19.42	17.70	0	0.1
03/25/10 (Joland)	11.55	8200.13	583.38	857.63	68.11	1	1
04/01/10 (Parker)	9.55	1481.53	25.20	83.20	45.41	0.4	1.4
04/15/10 (Joland)	8.13	701.83	18.67	7.92	19.98	0.1	1.1

Table 6. Descriptive statistics for different variables by watershed.

Optical Brighteners

Beach / Seep		*Mill Creek*		*Parker Creek*		*Luffenholtz Creek*		*Joland Creek*	
Mean	1.13	Mean	10.46	Mean	16.06	Mean	15.52	Mean	9.07
Std. Error	0.11	Std. Error	0.70	Std. Error	0.83	Std. Error	1.42	Std. Error	0.30
Median	1.08	Median	7.99	Median	17.02	Median	12.64	Median	8.59
Mode	#N/A	Mode	#N/A	Mode	#N/A	Mode	#N/A	Mode	#N/A
Std. Dev.	0.54	Std. Dev.	5.11	Std. Dev.	6.30	Std. Dev.	7.92	Std. Dev.	1.74
Skewness	0.64	Skewness	1.82	Skewness	-0.15	Skewness	0.26	Skewness	0.71
Range	1.94	Range	26.00	Range	25.02	Range	27.92	Range	6.47
Minimum	0.31	Minimum	5.72	Minimum	3.24	Minimum	1.46	Minimum	6.15
Maximum	2.25	Maximum	31.72	Maximum	28.26	Maximum	29.38	Maximum	12.62
Count	23	Count	54	Count	58	Count	31	Count	33

Total Coliform

Beach / Seep		*Mill Creek*		*Parker Creek*		*Luffenholtz Creek*		*Joland Creek*	
Mean	671.63	Mean	3714.70	Mean	2557.65	Mean	2502.08	Mean	2543.42
Std. Error	257.08	Std. Error	791.29	Std. Error	478.22	Std. Error	1878.04	Std. Error	709.63
Median	31	Median	424	Median	1935	Median	504	Median	697
Mode	1	Mode	9804	Mode	2755	Mode	#N/A	Mode	5172
Std. Dev.	1408.06	Std. Dev.	5814.76	Std. Dev.	3610.46	Std. Dev.	6771.38	Std. Dev.	4076.51
Skewness	2.35	Skewness	1.69	Skewness	4.78	Skewness	3.58	Skewness	2.68
Range	5171	Range	24959	Range	24811	Range	24970	Range	17088
Minimum	1	Minimum	41	Minimum	189	Minimum	30	Minimum	241
Maximum	5172	Maximum	25000	Maximum	25000	Maximum	25000	Maximum	17329
Count	30	Count	54	Count	57	Count	13	Count	33

Table 6. Descriptive statistics for different variables by watershed (cont).

E. Coli

Beach / Seep		*Mill Creek*		*Parker Creek*		*Luffenholtz Creek*		*Joland Creek*	
Mean	39.47	Mean	45.80	Mean	108.56	Mean	35.38	Mean	150.58
Std. Error	21.47	Std. Error	9.93	Std. Error	22.58	Std. Error	7.78	Std. Error	46.23
Median	1	Median	10	Median	31	Median	20	Median	10
Mode	1	Mode	1	Mode	1	Mode	20	Mode	1
Std. Dev.	117.60	Std. Dev.	72.94	Std. Dev.	170.44	Std. Dev.	28.05	Std. Dev.	265.58
Skewness	4.45	Skewness	1.65	Skewness	4.31	Skewness	0.83	Skewness	1.77
Range	615	Range	248	Range	1152	Range	96	Range	987
Minimum	1	Minimum	1	Minimum	1	Minimum	1	Minimum	1
Maximum	616	Maximum	249	Maximum	1153	Maximum	97	Maximum	988
Count	30	Count	54	Count	57	Count	13	Count	33

Enterococcus

Beach / Seep		*Mill Creek*		*Parker Creek*		*Luffenholtz Creek*		*Joland Creek*	
Mean	28.57	Mean	306.65	Mean	221.02	Mean	69.10	Mean	224.66
Std. Error	17.01	Std. Error	73.94	Std. Error	52.62	Std. Error	25.88	Std. Error	69.41
Median	1	Median	5.5	Median	121	Median	41	Median	20
Mode	1	Mode	1	Mode	1	Mode	41	Mode	20
Std. Dev.	93.19	Std. Dev.	533.20	Std. Dev.	397.24	Std. Dev.	81.83	Std. Dev.	392.65
Skewness	4.17	Skewness	1.56	Skewness	4.98	Skewness	2.05	Skewness	1.56
Range	463	Range	1788	Range	2754	Range	274	Range	1222
Minimum	1	Minimum	1	Minimum	1	Minimum	1	Minimum	1
Maximum	464	Maximum	1789	Maximum	2755	Maximum	275	Maximum	1223
Count	30	Count	52	Count	57	Count	10	Count	32

Table 6. Descriptive statistics for different variables by watershed (cont).

Turbidity

Parker Creek		*Luffenholtz Creek*		*Joland Creek*	
Mean	99.93	Mean	24.29	Mean	31.16
Std. Error	11.40	Std. Error	1.49	Std. Error	4.76
Median	50.78	Median	23.6	Median	20.485
Mode	#N/A	Mode	#N/A	Mode	#N/A
Std. Dev.	76.46	Std. Dev.	7.73	Std. Dev.	26.93
Skewness	0.5157217	Skewness	0.65	Skewness	2.20
Range	265.128	Range	43.093	Range	104.766
Minimum	9.372	Minimum	5.447	Minimum	9.234
Maximum	274.5	Maximum	48.54	Maximum	114
Count	45	Count	27	Count	32

Table 7. Median values of variables and their ranks by watershed.

Watershed	Obs		Coliform		E. coli		Enterococcus		Turbidity	
	Median	Rank	Median	Rank	Median	Rank	Median	Rank	Median	Rank
Beach / Seep	1.08	5	31	5	1	5	1	5		
Mill Creek	8	4	424	4	10	3	5.5	4		
Parker Creek	17	1	1935	1	31	1	121	1	50.8	1
Luffenholtz Creek	12.6	2	504	3	20	2	41	2	23.6	2
Joland Creek	8.6	3	697	2	10	3	20	3	20.5	3

5.0 Discussion & Conclusions

5.1 Project Performance

This project was designed to be instrumental in reducing bacterial discharge into Trinidad Bay. Twenty-three failed OWTS within 100 feet of a stream or bluff were repaired, which should equate to fewer bacterial exceedences in the surf zone and improvements in water quality in the creeks when analyzed. Further water quality monitoring is needed to validate that, though it should be recognized that there are still malfunctioning septic systems in the project area that are contributing to bacterial pollution. In addition, bacterial counts are highly variable, and it will be difficult to quantify and validate improvements. Ultimately, the main objectives of the project have been met: high risk areas were identified based on the OWTS status, fluorometry and OBs were tested as an OWTS source tracking tool, OWTS were inspected in the project area and fixed or repaired if needed, and the anthropogenic bacteria discharged into the ocean was monitored and reduced.

The project tasks were halted and modified due to State funding freezes. Time constraints necessitated alternative approaches than originally anticipated. The City used several qualified OWTS professionals and the County Division of Environmental Health to hasten the project in the end, rather than proceeding with original OWTS assessment methods that would have included a large number of inspections first, assessment and prioritization, and a financial assessment to determine costs and a sliding-scale funding amount.

5.1.1 Statistics & Results

Samples were taken on 18 different dates starting on September 17, 2008 and April 15, 2010. These dates included a range of seasonal variation and flow conditions. Samples were taken from five different watersheds: beach / seeps, Mill Creek, Parker Creek, Luffenholtz Creek and Joland Creek. Averages and ranges by date are presented in Tables 5. Summary descriptive statistics by watershed are provided in Tables 6 & 7. Please see the full study analysis / M.S. Thesis for HSU (Fluorometry as a bacterial source tracking tool in coastal watersheds, Trinidad, CA) for further information.

Overall this data shows a definite pattern in the sample averages by watershed. The Beaches and Seeps had the lowest averages for all five data categories. This was expected due to the high dilution factor in the ocean samples. Of the four creeks, Mill had the lowest averages. Again, this follows what would be expected based on the watershed characteristics. The upper and lower portions of the Mill Creek watershed are mostly undeveloped timber and park land. It has the lowest percentage of unknown OWTS ages and a high percentage of vacant residential parcels. Parker Creek had the highest average readings for all five data categories. This is also consistent with the fact that Parker Creek is a small, highly developed watershed with by far the greatest percentage of unknown OWTS ages or conditions. It also has the highest variety of land uses, small lots and a high percentage of impervious surfaces.

A bit surprisingly, Luffenholtz Creek had the second highest readings for all the variables other than coliform, for which it was third. It is surprising that Luffenholtz had higher readings than Joland because Luffenholtz has the largest lot sizes, lowest percentage of impervious surfaces and a high percentage of vacant and timber land.

Residential lots in Luffenholtz tend to have poor soils for OWTS and high groundwater, which could lead to excess polluted runoff. Luffenholtz also had the fewest sample points and the highest amount of rainfall before sampling events, which could be skewing the data higher.

Joland Creek is more densely developed than Luffenholtz, and does not contain timber lands, but it has soils that are more conducive to properly functioning OWTS. It also has a relatively low percentage of age unknown OWTS and high percentage of vacant parcels.

Each of the continuous variables was assessed separately with regard to bacteria readings, and none of them showed normality. The closest dataset to normal was the OBs; the bacteria and turbidity were furthest from normal. Even when data was grouped within watersheds, normality was not exhibited. Only when grouped by sample date, which also limited the sample size, did most of the data have a fairly normal distribution. Most of the readings were very low, but a few datasets, particularly after a rain event were very high. The lack of normality and prevalence of skew makes the data more difficult to analyze and is indicative of the high variability of water quality constituents.

Though direct linear relationships were not found, OB readings still hold promise as a tool for detecting human sources of bacterial pollution. The most statistically promising result could be exhibited in the logistic regression depicting rainfall, turbidity and OBs to accurately predict bacterial exceedences of contact recreational standards. This could not be fully analyzed due to not having enough exceedences in all the datasets. However, it offers up a window for further investigation. For the datasets that could be analyzed, several models had an 80% or greater correct classification rate. Multiple regression analyses using OBs, turbidity and rainfall as independent variables to predict bacteria counts within individual watersheds also had good results with some r^2 values around 0.9.

One explanation for the lack of direct relationships between the variables is that much of the bacteria in the creeks are not from human sources, but more from wildlife or pets. However, anecdotal information, including age of septic systems and density indicate that OWTS *should* be a contributing factor. Another possibility is that many of these older homes with older, malfunctioning septic systems do not have washing machines in their homes, and so bacteria being contributed the nearest creek is not associated with OBs. It has also been shown that OBs can degrade in the environment if exposed to sunlight, so if exposure occurs, OBs would degrade before bacteria. Even though canopy cover is fairly high on these creeks, there are areas that are exposed to sunlight. This is due to the level of clearings in more densely developed residential areas, which is where bacteria levels tend to be the highest. Consequently, it can be interpolated that the sun is degrading the OBs. The project was not expected to pinpoint individual failing systems, though this still may be possible (for example there were a few individual seeps with high bacteria and OBs that are worth investigating), but if the pollution is more diffuse, traveling very far or taking time, then OBs would not be a good surrogate since they break down in the environment.

Though clear, direct relationships were not found, there were large scale patterns between various watersheds characteristics: bacteria, rainfall, turbidity and OBs. For example, Parker and Joland Creek have the highest percentages of residential development; smallest average lot sizes; greatest impervious surfaces and oldest OWTS;

and as expected, also has the highest bacteria, optical brightener and turbidity levels. On the other hand, even though Luffenholtz Creek has lower levels, its area and discharge are so much greater than the other creeks, that it is actually contributing the most bacterial contamination to coastal waters. What did seem clear from the results is that each watershed has different water quality characteristics, and that analysis and conclusions are much stronger when considered on a watershed basis.

In addition, since much of the sampling took place as transects walking up a creek, graphing this data also provides good visual clues as to what is really happening in the environment. When the transects readings are graphed, peaks and valleys in the data are easily identified. These peaks, when compared to their field locations, often occur at confluences, including the seeps, inlets and small tributaries that drain into the creeks. These could be identified as potential problem areas, warranting further investigation of these convergences. If the funding freeze had not occurred, then these areas would have been the first to be offered free inspections to try to identify failing septic systems. This method holds serious promise for identifying and prioritizing areas with the highest pollution and directing future monitoring and restoration efforts.

One of the limitations in this study was the overall variability of the data. Samples were collected over a variety of seasons and weather patterns; this greatly affects water quality characteristics. Samples were taken at various seeps and tributaries while walking up the creeks, and some of these had very different characteristics from the main stream. In addition, bacterial sampling can be highly variable in itself. Previous water quality monitoring efforts in the Trinidad area—not associated with this project—have varied bacteria results for samples taken at the same time and place for quality control purposes, some by orders of magnitude. This same condition is evidenced by the magnitude of the variance found in the sample data. Previous research has also found that because weather conditions are often variable, multiple samplings may need to be conducted until a coherent picture of the sources of fecal contamination emerges. Variability can also be expected because bacteria counts are most often elevated in the Trinidad area during high runoff events during storms because rain appears to be one of the most important factors in generating high levels of bacteria. Surface runoff after a heavy rainfall may transport high levels of fecal bacteria to the water at the beach. The rain also increases the sediment in the water causing it to be murky. Since bacteria are destroyed by sunlight, murky water aids in their survival. These high loads influence and skew bacteria data, making it unfit for analysis. Therefore, collecting additional data and using another method for analysis would be beneficial to understanding bacteria/turbidity relationships.

5.1.2 Benefits & Successes

Overall community awareness of septic systems and how functioning states of OWTS can affect the environment were enhanced. Funding allowed for the identification of project priority watersheds, inspections of 32 systems and the repair/construction of 23 OWTS in the Trinidad/Westhaven area. Use of a fluorometer as a technique to identify faulty OWTS was researched. Water quality has been diligently monitored and the City of Trinidad now has tangible watershed data to prioritize more funding.

5.1.3 Water Quality Improvements

The differences in water quality pre- and post-OWTS construction need to be evaluated to measure success. The bacteria in the surf zones should be examined by observing changes via the numeric water quality data collected before the construction and after construction. Monitoring took place during construction and the *E. coli* and *Enterococcu*s averages in that time period dropped when compared to the same time period of the previous year. Coliform levels increased (Table 4), though this was only tracked during the construction phase and coliform is not a useful bacterial indicator by itself for determining human sources or health impacts (since there are so many types and sources of coliform in the environment). The data is not indicative of the project's success. Limited creek sampling and no surf sampling took place after construction was completed. This data was either nonexistent or incomparable to previous data because of its limitations (too many variables), therefore furnishing inconclusive results. The City of Trinidad will try to fund this task or pursue additional funding as much as possible to monitor and assess the success of the project.

5.1.4 Exceedence Ratios

Data was collected by the OWTS program by the City from 2008 to 2010 as part of the study to determine the relationship of repairing OWTS to the mixing zone fecal indicator bacteria (FIB) concentrations. Bacterial data was collected at the mixing zone where the creek enters the ocean and will be used to compare before and after water quality exceedence ratios at the different locations. Because monitoring could not happen after construction, this step will be evaluated in the future if funding permits.

5.2 Alternatives to the Water Quality Program

5.2.1 Recommendations

Most of the studies relating fluorometry and bacterial sampling in a targeted sampling effort have been conducted in lakes, estuaries or large watersheds as opposed to creeks. In these targeted sampling events, increasingly higher bacterial counts were used to visually find several of the sources. This was not an option for this study. The Trinidad watersheds are so small that most potential sources can be ruled out, so an alternate indicator is necessary to target sources. It was found that, along with rainfall and turbidity, optical brighteners can help watershed managers assess and characterize bacterial pollution in their stream and to help predict when bacterial exceedances. The fluorometry study in this case may not have reached its full potential and further sampling would help to clarify the results.

Though high-priority sub-watersheds and neighborhoods were not identified prior to starting repairs and inspections due to the funding freeze, transect sampling results identified tributaries and seeps contributing higher than average bacteria and optical brighteners; this warrants further investigation. Also, though more systems were repaired than originally anticipated, fewer systems were inspected. There is still a very high percentage of OWTS within the project area that has no file information or permits. This means that these systems will continue to contribute bacterial pollution into the local

creeks that drain onto beaches and put the public at risk. The City of Trinidad has implemented a regulatory OWTS Management Program within City limits, but the majority of the project area is within Humboldt County jurisdiction. The grant program increased community awareness of water quality and OWTS issues, but the project area falls within a community that is considered to be 'economically disadvantaged.' This makes it difficult for people to afford the $8,000 or more in OWTS repair, even if they are aware of the potential pollution it is causing. Much more work is needed in the project area in order to completely eliminate human sources of bacterial pollution. Several recommendations for future work include:

(1) Additional sampling, particularly longitudinal transects, to future characterize the relationships between optical brighteners, turbidity, rainfall and bacteria within these watersheds to strengthen the fluorometer's potential use as a source tracking too,
(2) Additional sampling, particularly longitudinal transects, to identify and prioritize small areas that are contributing the greatest amounts of pollutants,
(3) Additional beach sampling to assess the effectiveness of the OWTS repairs on water quality,
(4) Pursuing and administering funding for additional OWTS inspections and repairs for economically disadvantaged homeowners within the project area,
(5) Pursuing and administering funding for additional public education and community outreach regarding proper use and maintenance of OWTS and the dangers of OWTS pollution.
(6) Pursuing and administering additional funding to maintain and expand the Trinidad-Westhaven Watershed Council as a forum for community consensus building and a vehicle for public education, and
(7) Pursuing and administering to explore the feasibility of adopting a regulatory or incentive-based OWTS maintenance program similar to the City's for unincorporated lands in the project area.

6.0 Additional Data

6.1 Table of submitted Deliverables

Deliverable	Due Date	Date Submitted
SCOPE OF WORK	**(mm/dd/yy)**	**(mm/dd/yy)**
A.1 GPS Information / Shapefile	Day 90 (with 1st Invoice)	4/18/2008
A.2 PAEP	Oct. 2007	10/26/2007
A.3 Monitoring Plan	Day 90	7/11/2008
A.4 Quality Assurance Plan	Day 90	7/11/2008
A.5 CEQA	Oct. 2007	10/26/2007
A.7 Permits	As needed	10/20/10 (supplemental)
B.2.2 OWTS Program OWTS Ordinance	7/1/2008	01/19/09
B.4.3 Present Results (Journals, Newsletters, and / or Conference Materials)	12/1/2009	10/20/2010
A. Invoices	Quarterly	Quarterly
1. Grant Summary Form	Day 90 (with 1st Invoice)	10/17/2008
2. Progress Reports	Quarterly	Quarterly
2a. Annual Progress Summary	Annually	10/17/2008
3. NRPI Project Survey Form	Before Final Invoice	
4. Draft Project Report	11/1/2010	12/20/2010
5. Final Project Report	12/1/2010	

6.2 Budget

The State granted a budget of $470,350.00 for this project. The project, to date, is under budget. Though the project was successful in meeting the tasks outlined in the grant contract, funding was not allocated as originally reported due to the State of California's budget freeze in 2009. Project work was delayed and had to be fast-tracked so some tasks were altered or by-passed to focus on a main component of the project—construction or repair of faulty septic systems. A budget amendment was made to transfer $25,000 from the Consultant / Professional Services line item to the Construction line item in order to fix additional OWTS. This was done mainly because monitoring did not cost as much as originally anticipated, partly because the effectiveness monitoring was not completed and because DEH was less expensive then expected. No match from other sources was required due to the disadvantaged status of the community. However, some match funding was provided by property owners receiving OWTS repair money, but these amounts have not been documented. Most owners paid at least the permits costs of their system (around $1,000), some more or less. Additional funding is being pursued by the City of Trinidad to gather water quality data needed for additional analyses. Monitoring of the beaches and seeps is a point of concern considering there was not adequate time to assess improvements post-construction. The budget comparison chart is below.

Budget v. Actual		
Line Item	Grant Allotment	Expenditures (to date)
Personnel	$3,200.00	$1,600.00
Operating	$5,800.00	$3,500.00
Professional/ Consultant Services	$168,850.00	$113,083.62
Construction	$292,500.00	$237,720.31
TOTALS	$470,350.00	$355,903.93

APPENDIX A

ACRONYMS AND ABBREVIATIONS

ASBS	Area of Special Biological Significance
CCA	California Coastal Commission
CEQA	California Environmental Quality Act
DEH	Department of Environmental Health
FIB	Fecal indicator bacteria
GIS	Geographic Information System
MP	Monitoring Plan
OB	Optical brighteners
OWTS	Onsite Wastewater Treatment Systems
PAEP	Project Assessment and Evaluation Plan
QAPP	Quality Assurance Project Plan
SWAMP	State Water Board's Surface Water Ambient Monitoring Program
SWQPA	State Water Quality Protection Area
USEPA	United States Environmental Protection Agency

APPENDIX B

REPAIRS & DESCRIPTIONS

Owner	Address	Owner Contribution	Billed Cost	Existing System.	Destroy existing tank	Install septic tank	Install effluent filter	Install risers	Comments
Dimmick	380 View	$ 665.00	$13,070.42	1940's system. Evidence of leach field failure.	√	1500 gal	√	√	Installed disposal field.
Franzoni	341 Ocean	$ 665.00	$12,450.00	Decayed wooden tank & compacted leach pit (open).	√	1500 gal	√	√	Installed leach field.
Buckman/ Spencer	1068 Westhaven	$ 1,500.00	$23,580.27	Septic lines comprised by roots, cracks. Tank pressurized.	√	1500 gal	√	√	Sized & installed appropriate pump for distribution box.
Kieselhorst/ Eckart	101 Westhaven	$1,330 + labor, some materials	$19,486.12	Leach field failed. Unpermitted repair & improper installation lead to septic tank failure.	√	1500 gal	√	√	Replaced 12" of good quality topsoil over disposal field after effluent backed up during inspection.
Hakenen	847 9th	$ 1,306.00	$15,646.00	Failed tank.	√	1500 gal	√	√	750-gal pump installed.
Hansen	610 Westhaven	$ 665.00	$ 6,710.00	Unpermitted system.	√	1500 gal	√	√	Cleared sites to build systems.
Pearson	216 Loop Place	$ 1,306.00	$10,400.00	Failed tank <50 ft from bluff..	√	1800 gal	√	√	
Thissel/ Christainson	911 Cedar	$ 1,503.00	$16,782.00	Failed system.	√	1500 gal	√	√	
Hinderycks	334 Wagner	$ 665.00	$12,450.00	Unpermitted 1940's wooden box under house in cesspool.	√	1500 gal	√	√	

Kallish	183 Lanford	$ 665.00	$15,793.00	Failed system.	√	1500 gal	√	√	Included leach field restoration. Removed decking/walkway over septic tank. Placed 10" of topsoil over entire disposal field.
Kelly	181 Bauder	$ 1,306.00	$18,965.00	Tank compacted with roots. Failed leach pit system within 50' of Trinidad water supply.	√	1500 gal	√	√	16" of topsoil over leach field.
Stroven	666 Old Wagon	$ 1,601.00	$17,800.00	Failed system.	√	1800 gal	√	√	
Stone	151 Westhaven	$ 665.00	$12,600.00	Failed system.	√	1500 gal	√	√	Installed leach field & 750 gallon pump tank.
Spinas	500 West	$0	$ 3,847.50	Cracked tank.			√	√	Install pump & repair septic tank.
Engelmann	93 Stumptown	$ 665.00	$ 7,000.00	Illegal discharge of waste into holding tank.	√	1500 gal	√	√	Installed infiltrator lines with 12" topsoil, graded & seeded.
Filipponi	37 Fox Farm	$ 665.00	$ 3,000.00	Repair.			√	√	Installed new leach field.
Madrone (x2)	1519 & 1571 Fox Farm Rd	$665 + labor	$19,200.00	Unpermitted pit systems. One was approved for funding & the other was found collapsed upon inspection.	√	1500 gal	√	√	Installed new leach lines, modified inlet lines. Grading & seed & straw applied as needed.
Bryant	164 Loop Place	$0	$ 7,800.00	Unpermitted and failed concrete tank with degraded wooden lid 50 feet from the bluff.	√	1500 gal	√	√	Installed new leach lines. Graded out & reseeded.
Hill-Rocha/ Quillman	736 S Westhaven	$665	$12,975.00	Homemade, unpermitted pit system in poor condition and 40 feet from creek.	√	1000 gal	√	√	Installed 300 gallon pump chamber, leach lines, & high water alarm. Graded & applied 16" topsoil & reseeded area.

Williams	463 N Westhaven	$0	$ 6,000.00	Leach field failed; effluent at ground level. Old redwood septic tank in open pit.	√	1200 gal	√	√	Installed new leach lines.
Rosser	1571 Fox Farm	$0	$10,800.00	Failed tank.	√	1500 gal	√	√	

APPENDIX C

P.O. BOX 390

409 Trinity Street
Trinidad, CA 95570
(707) 677-0223

ORDINANCE NO. 2010-10

February 10, 2010 Amendment of previous Ordinance 2008-03

CITY OF TRINIDAD ONSITE WASTEWATER TREATMENT SYSTEM (OWTS) ORDINANCE

SECTION 13.12.010 – GENERAL PROVISIONS

Subsection A – Purpose

The Trinidad City Council hereby finds the following:

1. On-site Wastewater Treatment Systems (OWTS) or septic systems are prone to failure with age, out-moded design, overuse or improper installation, repair and maintenance; many of the OWTS within the City of Trinidad are old and not to current standards.

2. OWTS failure poses a risk to public health, safety and welfare and a potential contamination source to the surface waters, groundwater and the ocean waters within or adjacent to the City of Trinidad.

3. A centralized sewer system is undesirable for Trinidad because of growth-inducing impacts and unfeasible due to the high costs of land, construction and maintenance.

4. OWTS are a cost-effective and long term option for meeting public health and water quality goals and standards as long as they are adequately managed.

5. The purpose of this ordinance is to assure all OWTS in Trinidad are properly operated, regularly inspected, routinely maintained and monitored to prevent poorly functioning or failed systems and to establish a basis for an OWTS Management Program that will supplement this ordinance with specific policies and implementation measures consistent with the purposes of this ordinance.

Subsection B – Jurisdiction

This chapter/ordinance shall apply to all territory embraced within the incorporated limits of the City of Trinidad, County of Humboldt, State of California.

Subsection C – Authority

CA Water Code §13290-13291.7 and CA Health and Safety Code §5410-5416.

Subsection D –Liability

This chapter shall not be construed as imposing upon the City any liability or responsibility for damage resulting from the defective installation, repair, inspection or maintenance of any sewage disposal system or part thereof as herein provided, nor shall the city or any official, employee or city-designated contractor thereof be held as assuming any such liability or responsibility by reason of the inspections or work authorized herein.

Subsection E – Interpretation / Construction

Unless the context otherwise requires, the definitions set forth in Appendix A of this ordinance, as may be amended from time to time, shall be used in the interpretation and construction of this chapter. Words used in the present tense include the past and future. The singular number shall include the plural, and the plural shall include the singular. The word “shall” is mandatory. Words that are defined in Appendix A are italicized herein.

Subsection F – Adequate Sewage Disposal Required

Every person owning any building designed or used for human occupation, including residential, commercial and public buildings, shall be required to provide and maintain a properly functioning OWTS. An OWTS shall provide for the disposal of sewage in a manner that does not create a public health hazard and does not degrade surface or groundwater quality. All OWTS, both existing and new, and all parts thereof, shall be maintained in a safe and sanitary condition at all times. The owner shall be

responsible for the maintenance of such systems. Where permitted, an OWTS shall be provided for each building designed for human occupation, except that a group of legally established, detached buildings, occupying land under one or more ownerships and having a legally shared area in common, may be serviced by a single individual sewage disposal system designed to meet those collective needs.

Subsection G – Permits Required

It is unlawful for any person to connect to, construct, repair, replace, reconstruct, maintain, or use any OWTS in this jurisdiction except as provided for in this ordinance and unless an applicable sewage disposal permit from the Health Officer and / or operating permit from the OWTS Administrator is obtained.

Subsection H – Permit Fees / Program Financing

The City Council, in a manner prescribed by law, may by resolution establish and alter fees, deposits and / or charges for receiving applications, holding hearings thereon, reviewing plans and specifications, reviewing inspection reports, monitoring OWTS and water quality and issuing permits, and for performing any other service for maintaining and administering the OWTS Management Program established pursuant to this ordinance. Said fees shall be sufficient to offset the cost of implementing the Trinidad OWTS Program, including monitoring. Operating Permit(s) shall not be valid unless such fees have been paid.

Subsection I – Health Officer

The position of Trinidad Health Officer is hereby established to enforce the Trinidad Sewage Disposal Regulations. This is the technical position of the Trinidad OWTS Program. The Health Officer shall be responsible for establishing regulations (§1:11), enforcing regulations in conjunction with the Building Official, for advising the OWTS Administrator (§1:10) on technical issues and those relating to public and environmental health and safety, and to ensure that all installations, repairs, modifications and other activities related to OWTS are in compliance with State Law, the North Coast Basin Plan and this Ordinance.

Subsection J – Program Administration / OWTS Administrator

The position of OWTS Administrator is hereby established to enforce the provisions of this ordinance. The City OWTS Administrator shall be responsible for coordinating activities between the City, the Health Officer, the Qualified Service Provider, and the property owner, for keeping a list of verified Qualified Service Providers, for receiving and reviewing permit applications, OWTS Owner/User's Questionnaires and inspection reports, for upkeep of the database, for issuing operating permits and for assuring provisions of this ordinance are being met or taking the necessary steps to assure the purposes of this ordinance are being met.

Subsection K – Sewage Disposal Regulations

The Health Officer shall issue such regulations as deemed necessary to carry out the provisions of this chapter. The Sewage Disposal Regulations issued by the Health Officer under this section shall become effective when adopted by resolution of the City Council and shall be incorporated into this ordinance as Appendix C. Regulations issued under this section may be amended from time to time by the Health Officer after resolution by the City Council.

Subsection L – OWTS Guidelines

This ordinance shall be supplemented with guidelines to aid in the interpretation and implementation of the ordinance and to allow for adaptive management of the OWTS Program. The Guidelines shall become effective when adopted by resolution of the ***City Council*** and shall be made a part of this

ordinance as Appendix B. Guidelines issued pursuant to this section may be amended from time to time as needed by staff after ***City Council*** approval to provide clarification to these ordinance provisions.

SECTION 13.12.020 – SPECIFIC PROVISIONS

Subsection A – Leach field Protection During Construction

Construction related activities for development are to occur in a manner that does not impact the integrity of the primary or reserve sewage disposal areas.

Subsection B – Reserve Area Required

All new and modified OWTS and repairs shall be required to receive approval from the Health Officer for a suitable 100% reserve leach field area unless an exception is granted by the Health Officer. As part of any application for Design Review, Coastal Development Permit or any other discretionary permit, the applicant may be required to receive approval for a suitable 100% reserve area at the discretion of the Health Officer. Parcels with less than 100% reserve area shall be regulated as Nonstandard Systems.

Subsection C – Effluent Filters/Risers

All new OWTS shall be required to install risers at grade at all access points and an effluent filter as part of the construction. All existing OWTS shall be required to be equipped with risers at all access points and an effluent filter prior to, or at the time of, the first scheduled performance inspection (Article 4) as dictated by the OWTS Operating Permit. The OWTS Administrator or Health Officer can issue exceptions for existing systems in cases where risers would be inappropriate, or infeasible as long as the OWTS is reasonably accessible.

Subsection D – Roof Drainage away from OWTS

All roof drainage downspouts on buildings shall be directed in such a manner that runoff does not negatively impact the function of any OWTS.

Subsection E – Landscaping

Landscaping shall not be allowed to interfere with OWTS components, including the tank and leach field area. If vegetation is found to be interfering with the performance of any OWTS component(s), the OWTS Administrator or Health Officer may order such vegetation to be removed from the area of concern.

Subsection F – Deed Restrictions

As part of the approval of any coastal development permit for development that affects the OWTS as determined by the OWTS Administrator, the property owner(s) shall be required to record a statement on the deed, in a form approved by the City Attorney, indicating that any increase in the number of units or bedrooms above that approved by the City, or in excess of the design capacity of the OWTS, will require City approval of adequate sewage disposal capabilities. Deed restrictions should be revised to reflect any system modifications.

Subsection G – Subdivisions

Prior to the approval of any subdivision or lot line adjustment, the applicant must apply for and obtain approval from the Health Officer for the design of an OWTS for each lot adequate for the use for which the property is designated.

SECTION 13.12.030 – SEWAGE DISPOSAL PERMITS

Subsection A – General

No person shall construct, reconstruct, or undertake any repair, addition, or modification of any OWTS or any portion thereof on any property within the City Limits without having first obtained a permit to do so from the Health Officer. This provision shall not apply to emergency work necessary due to the immediate failure of an existing system, when it shall be proved to the satisfaction of the Health Officer that such work is urgently necessary and that it is not practical to obtain a permit before commencement of the work. In all such cases, prior approval shall be obtained from the Health Officer, and an application for permit must be submitted within three business days after commencement of the work. Minor maintenance, as defined in Appendix A, may be made without permit.

Subsection B – Application Process

Each application for a permit to construct or repair an OWTS shall be made on a Sewage Disposal Permit Application form provided and / or approved by the Health Officer and accompanied by the appropriate fee as set forth by the City Council per §1:08. The City Clerk shall be responsible for receiving applications and forwarding them to the Health Officer. The application shall not be considered complete until all the information requested by the City Clerk and / or Health Officer has been submitted. The Health Officer may require changes to the proposed design of a system in order to conform to applicable regulations. The Health Officer shall approve or deny an application within 60 days of a complete application submittal. A written record of the Health Officer's decision shall be provided to the applicant. Appeals shall be in accordance with §8:10. A permit to construct or repair shall expire if work has not started within one year of permit approval and / or has not passed final inspection within two years of permit approval, unless an extension is granted by the Health Officer.

Subsection C – Licensing Requirements

All OWTS within the City Limits shall be designed by a qualified professional as deemed adequate by the Health Officer. All work done pursuant to a sewage disposal permit shall be done by or under the supervision of a person holding an appropriate license or other qualification, such as a contractor, pursuant to state law.

Subsection D – Design and Construction Standards

The siting, design and construction of new, and the repair and modification of existing OWTS, shall be in accordance with current standards of the Trinidad Sewage Disposal Regulations and criteria of the North Coast Regional Water Quality Control Board Basin Plan. Repairs and modifications that do not bring the entire OWTS up to current standards, but which increase conformance or improve performance, shall be allowed at the discretion of the Health Officer in accordance with the Trinidad Sewage Disposal Regulations, this ordinance, and the OWTS Program Guidelines.

Subsection E – Conformance and Final Inspections

In addition to any inspections performed by the designer, all work for which a construction/repair permit is required shall be subject to, at the minimum, a final inspection by the Health Officer or his representative in order to determine if such work conforms to the approved application, plans and specifications. Additional inspections during construction may be required at the discretion of the Health Officer. All such work shall remain accessible and exposed for inspection purposes until inspected and approved and it shall be the responsibility of the owner or authorized agent to assure that required inspections are obtained. Should such work not be accessible for inspection, neither the City nor its employees and officers shall be liable for the expense entailed in the removal or replacement of any material required to allow inspection. Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or other laws, ordinances or regulations. In the event that the Health Officer determines that there has been an improper installation or repair or other work on an

OWTS, a stop-work-order may be posted on the job site. Before any further work is done on the site, clearance from the Health Officer must be obtained.

SECTION 13.12.040 – PERFORMANCE INSPECTIONS

Subsection A – Initial Inspections for Existing Systems

All existing OWTS three years or older at the time this ordinance is adopted, and which have not had an inspection within the last three years, shall be subject to an initial on-site inspection, in accordance with this ordinance and the OWTS Inspection Report Form as approved by the Health Officer and / or OWTS Administrator, by a Qualified Service Provider at the expense of the OWTS Owner / User. Initial inspections shall be conducted in the same manner as performance inspections.

Subsection B - Initial Inspection Schedule

Initial inspections for all OWTS over three years of age within City limits shall be completed by December 31, 2008. For existing systems less than three years of age, an initial inspection shall be required within 90 days, of the system becoming three years old (from the time of final inspection when installed), or December 31, 2008, whichever is later. For those systems that were inspected prior to the adoption of this ordinance under the City's 'early bird' special, initial inspections shall be completed within 3 years and 6 months after the date of the early bird inspection.

Subsection C – Inspection Forms and Database Development

A standard OWTS Inspection Report Form and OWTS Owner / User Questionnaire shall be developed by the OWTS Administrator and a record maintained by the City for each OWTS inspected. This form shall include information regarding the condition of the system and changes that have occurred since the last inspection and any other pertinent information. The property owner shall provide the OWTS Administrator and / or Qualified Service Provider, with any pertinent information that the property owner (or their septic pumper or installer) has regarding the use, age, location, maintenance history, design, etc of the OWTS as part of the OWTS Owner / User Questionnaire. The OWTS Inspection Report shall be completed by the Qualified Service Provider at the time of initial or performance inspection; the property owner shall be provided a copy of this report. Using inspection data and other available information, the City shall develop and maintain a database of all OWTS within the City limits.

Subsection D – Performance Inspections

Performance inspections shall be conducted by a Qualified Service Provider at the expense of the owner and in the same manner as the initial inspection to check the performance of the system relative to normal operating criteria, public health and water quality standards as outlined in this ordinance and the OWTS Guidelines (Appendix B) and in accordance with the OWTS Inspection Report Form. Such inspection shall be arranged by the owner with a qualified service provider, within thirty (30) days of the date stipulated in the operating permit (Article 5). If pumping is also required, these inspections shall be conducted prior to, or at the time of, pumping as determined by the maintenance schedule provided in the operating permit (Article 5). Results shall be provided to the City and to the owner. Results may be appealed in accordance with the appeal procedures of section 8:12 of this ordinance.

Subsection E – OWTS & Water Quality Monitoring Program

A water quality monitoring program shall be developed as part of the City's OWTS Management Program. The City shall maintain a Monitoring Program and Quality Assurance Project Plan (QAPP), and make it available to the public. Where an inspection indicates that an OWTS is not functioning properly or water quality sampling indicates that there may be a problem, sampling wells may be required to be installed by the property owner in and around an OWTS as part of the issuance and terms of an operating permit. If

deemed necessary by the OWTS Administrator, water samples shall also be collected and analyzed as part of a performance inspection.

Subsection F – Performance Standards

During a performance inspection, the Qualified Service Provider shall determine whether the OWTS adversely affects the public health and environment or violates any other applicable rules or regulations. This evaluation shall be detailed enough to determine whether the OWTS structure and its operational status are in substantial conformance with the standards of this Ordinance, the City's OWTS Management Program Guidelines and the North Coast Regional Basin Plan and other applicable laws and regulations. OWTS repairs and modifications may be required if the OWTS Administrator or Health Officer determines that the OWTS is not functioning or performing in accordance with this ordinance and / or the City's overall OWTS Management Program or other applicable laws and regulations. Guidance for Performance Standards shall be provided in Appendix B – Guidelines.

Subsection G – Accessibility for Inspections

OWTS shall remain accessible at all times. The owner shall maintain the OWTS so that it is readily accessible for inspection and maintenance. The placement of structures, swimming pools, patios, driveways, or other impervious surfaces over the septic tank or leach field is prohibited. Exceptions for unusual circumstances and existing systems may be considered by the Health Officer and / or OWTS Administrator.

SECTION 13.12.050 – OPERATING PERMITS

Subsection A – General

Upon application and completion in conformance with this code and final inspection of work performed pursuant to a Sewage Disposal Permit, or after Initial / Performance inspections of existing systems, all owners shall be required to apply for an Operating Permit. An Operating Permit shall be required in addition to any other permits required by City ordinances and / or State law. Operating Permits shall be issued to the owner of the property and / or the business owner. After December 31, 2008, or as specified in §4.02, it shall be unlawful and a public nuisance to use or operate any OWTS within the City without a valid operating permit from the City. Every operating permit shall indicate the design capacity of the system, maintenance requirements and any other conditions of use (see §5:04). A copy of said operating permit, with conditions, shall be sent to the property owner and shall be kept on file with the City. It the responsibility of the property owner to ensure that any tenants conform to the conditions of use specified in the Operating Permit In cases where an initial / performance inspection indicates a system operating at less than a satisfactory capacity, a limited operating permit may be issued.

Subsection B – Application Process

Every person owning any building designed or used for human occupation existing on the effective date of this ordinance, including residential, commercial and public buildings, or their authorized representative, shall be required to apply for an Operating Permit through the City Clerk's office prior to final inspection of a new or modified sewage disposal system or after an initial / performance inspection of existing systems.

Subsection C – Permit Transfer

In the event of the sale of the property or change in business or rental occupancy, an Operating Permit Transfer shall be applied for by the residence owner / business occupant within 60 days of the finalization of the sale of the property or change in occupancy. An administrative fee, as set by resolution of the City Council, may be charged to offset the costs to the City for transferring permits.

Subsection D – Permit Conditions

Maintenance schedules and requirements (Article 6) shall be stipulated in the operating permit. An operating permit shall be conditioned upon the proper maintenance and pumping of, and the continued proper operation of the OWTS as designed, constructed and conditioned as stated in the operating permit, upon payment of periodic permit fees, upon periodic inspections of said OWTS, upon continuation of the use for which the system was designed or capable of and upon continued performance as indicated by subsequent performance inspections and the City's water quality monitoring program. The Permit holder shall show proof of the required maintenance and operation as stipulated in the Permit conditions in the form of an Inspection Report Form in order to renew said Permit. Operating Permit conditions may be appealed in accordance with §8:10.

Subsection E – Permit Renewal

Operating permits shall be renewed every three years, or as specified in the permit based on the specific condition of and maintenance requirements of the system, but in no case shall an operating permit be issued for more than five years. Operating permits are to be renewed after a performance inspection by a qualified service provider at an interval as specified in the operating permit and maintenance schedule (Article 6). The process for renewing operating permits shall be the same as for the original application as set forth in §5:02.

SECTION 13.12.060 – MAINTENANCE

Subsection A – Maintenance Requirements

All OWTS within City limits shall be required to be adequately maintained based on the type and amount of use and the design of the system as part of the conditions of an operating permit. Required maintenance shall include, at a minimum, regular inspections (Article 4) and pumping of solids at intervals not to exceed 5 years. Depending on the type of system, other maintenance may include, but is not limited to, switching the distribution to the leach field and flushing of effluent filters. Following each inspection of an OWTS by the qualified service provider, the OWTS Administrator will be given a copy of the Inspection Report Form and OWTS Owner/User's Questionnaire indicating the condition of and the recommended maintenance requirements for that particular system.

Subsection B – Maintenance Schedule

The Health Officer and / or OWTS Administrator shall determine the maximum allowable period for the maintenance and pumping requirements for each system. The basis for maintenance schedules shall be detailed in the OWTS Guidelines (Appendix B) and shall consider things such as, but not limited to, the size and design of the tank, number of bedrooms, number of people living in the house, age of system, proximity to streams and other sensitive resources, amount of water use, and the results of performance inspections. When it is time for a system to be reinspected, the system's owner will be notified by the OWTS Administrator of the need to do so. Once inspected, a completed inspection form by a qualified service provider must be presented to the OWTS Administrator by the homeowner or business owner. The resulting maintenance schedule as determined by the OWTS Administrator and / or Health Officer shall supersede any existing or previous maintenance schedule that may be / have been in effect.

Subsection C – Changes in Inspection or Maintenance Schedule

The OWTS Administrator, with due cause and upon written notification to the landowner, may change the inspection and/or maintenance requirements and schedule of an OWTS, where such a change is deemed necessary for the proper functioning of the OWTS. This may occur due to circumstances such as changes in household occupancy, seasonal use, rental status, water consumption, system functioning, site characteristics or other significant elements of the inspection report.

Likewise, the OWTS Owner/User may petition the OWTS Administrator to alter the inspection and/or maintenance schedule. The owner must demonstrate, through the use of appropriate site data and household information, that such a change in the requirements would still ensure the proper operation of the OWTS and fulfill the intent of this ordinance. Information to be used by an OWTS Owner/User in the petition may include OWTS inspection records, technological modifications and site data such as soils, water table, household information, seasonal use, water use, etc.

SECTION 13.12.070 – NONSTANDARD SYSTEMS / SPECIAL CIRCUMSTANCES / MODIFICATIONS OR REPAIRS REQUIRED

Subsection A – Transfer of Property

Upon transfer or sale of property within the City of Trinidad, the OWTS for that property shall be assessed at the time of Operating Permit transfer by the City for its compliance with current standards of the Trinidad Sewage Disposal Regulations and this ordinance. If the OWTS is determined to be nonconforming system, or if it was determined to be functioning at a less than Satisfactory level at the time of the most recent inspection, then upgrades to current standards may be required prior to a full operating permit being issued for the new owner in accordance with §7.06. Exceptions may be made by the OWTS Administrator or Health Officer for special circumstances such as if the lot is too small to accommodate a conventional system.

Pursuant to CA Civil Code §1102.6a the City of Trinidad hereby requires that this OWTS Ordinance be disclosed to prospective buyers of any real property within the City limits of the City of Trinidad in a form approved by the State of California. Local Realtors and Real Estate Agents shall be notified of these provisions though the Humboldt County Association of Realtors and informational packets sent to Realtors and Agents in the Area. The City may monitor homes for sale within City limits to ensure the appropriate information is disseminated.

Subsection B – Building Alterations / Development

Whenever any person submits an application to the City for a Coastal Development Permit or a Building Permit for the purpose of making any alterations to, or enlargement of, any structure which meets the definition of "Development" as set forth in Appendix A, said applicant must demonstrate that the existing OWTS meets the requirements set forth in the Trinidad OWTS Program. Determination of whether or not an OWTS substantially complies with this code is within the joint discretion of the OWTS Administrator and the Health Officer, with the Health Officer having final say in case of a disagreement.

Subsection C – Nonstandard OWTS

1. Operating Permits for Nonstandard Systems. Nonstandard systems include alternative systems, nonconforming systems, haul away systems and failed systems. The Health Officer or OWTS Administrator may approve the use of nonstandard system designs which are not in conformance with the standard system requirements specified in this Chapter and / or the Trinidad Sewage Disposal Regulations, provided measures are taken to maintain the proper function of such systems as specified in Subsection E.

2. Failing Systems. The Health Officer may allow the continued use of an existing system which has been determined to be failing, if, due to extreme circumstances, that system cannot be upgraded to meet the standards specified in this Ordinance or the Trinidad Sewage Disposal Regulations, and the owner/agent takes measures which will ensure the minimum proper function of such system as specified in Subsection E and Article 8 of this Ordinance.

3. Nonconforming systems. Those systems which were legally established, but which do not conform to current standards shall be regulated as nonstandard systems, except those systems with only minor nonconformance that does not affect the functioning of the system, such as not meeting setbacks.

4. Alternative Systems. All existing alternative systems, or those serving new or expanded development as provided for in the Trinidad Sewage Disposal Regulations shall be considered Nonstandard Systems and shall be required to meet the nonstandard system requirements specified in Subsection E.

5. Requirements. Use of a nonstandard system shall be subject to the following requirements:

    a. The OWTS Administrator shall record a Notice of Nonstandard System on the property deed as specified in §7.04.

    b. The property owner shall maintain the system, monitor system performance, utilize required water conservation measures, comply with any special requirements established as a condition for approval of the Operating Permit for the use of that specific system and/or specified in the Notice of Nonstandard System, and if necessary, take measures deemed necessary by the Health Officer to protect public health and safety and the environment.

    c. Nonstandard systems shall be required to have a valid maintenance contract with a qualified service provider to ensure that the above conditions are satisfied. Operating permits for nonstandard systems shall not be issued for more than two years, unless the Health Officer and / or OWTS Administrator determines that an alternative schedule is warranted.

    d. If an inspection or other information reveals that the system is functioning at a less than satisfactory level and/or is not in compliance with requirements specified in the Operating Permit, the property owner may be subject to a violation fee and will be required to upgrade the system and/or modify operation as necessary to ensure proper function and operation.

    e. Properties served by nonstandard systems may be charged higher Operating Permit fees, as established by resolution of the City Council, to offset the additional costs of reviewing Inspection Reports. The OWTS Administrator may waive the extra charge for systems which meet all standards except adequate expansion area and which continues to perform adequately.

    f. The Health Officer and / or OWTS Administrator shall establish policies and procedures for use of nonstandard systems in addition to these numerated herein.

6. Owner Acceptance of Requirements. Before the OWTS Administrator approves a permit for the use of a Nonstandard System, the owner of the property must enter into an agreement with the City of Trinidad acknowledging and accepting the requirements for use of a Nonstandard System as described above.

Subsection D – Notice of Nonstandard System

1. Requirement. A Notice of Nonstandard System shall be recorded by the OWTS Administrator with the County Recorder's Office on the deed of any property served by an approved Nonstandard System as described in Section 7.03. The Notice of Nonstandard System will include all the information as specified in the Guidelines.

2. Expungement. If the system is eventually modified under approved permit(s) to meet the requirements for a standard system, the OWTS Administrator shall, upon payment by the property owner of fees for expungement, record a Notice of Expungement for the Notice of Nonstandard System with the County Recorder.

Subsection E – Accessory Dwelling Units

1. Illegal Accessory Dwelling Units: When an inspection, or other information, reveals that an OWTS has been connected to an illegal accessory dwelling unit and is accepting wastewater from that unit, the

Building Official or OWTS Administrator may order the immediate discontinuance and disconnection of the illegal accessory dwelling unit and / or require the property owner to submit an application to the City for an Accessory Dwelling Unit. If such application is not submitted within 30 days of written notice, the OWTS Administrator and / or Building Official shall commence Nuisance Abatement procedures according to City ordinances.

2. Nonconforming Accessory Dwelling Units: Nonconforming accessory dwelling units shall be assessed for their conformance with both City land use regulations as well as the requirements of this chapter. An OWTS serving nonconforming accessory dwelling units shall be considered a 'non-standard system,' subject to the requirements of §7.03. These systems shall be subject to increased monitoring and maintenance requirements according the OWTS Management Program Guidelines. In order to ensure these systems are not being overused, limitations on the amount of wastewater entering the system may be enacted; the amount of water use per month should be used to track the amount of wastewater and monitoring wells may be installed. In addition, modifications may be required such as installation of water saving plumbing devices, removal of garbage disposals or other means to protect the integrity of the OWTS.

Subsection F – Modifications / Repairs Required

Modifications and repairs of nonconforming and failing systems shall be required in the following situations:

1. In the case of a failing or inadequately functioning systems, when public health and environmental safety is threatened (Guidelines §7.06 and Ordinance §8.04);
2. When property ownership or business occupation is transferred (Guidelines §7.01);
3. When building or site alterations are made under a Coastal Development or Building Permit (Guidelines §7.02);
4. Other situations where the Health Officer and / or OWTS Administrator deems it necessary to protect public health and the environment (Guidelines §7.06).

Guidelines for determination of when an OWTS needs to be repaired or modified shall be detailed in the OWTS Management Program Guidelines (Appendix B), herein incorporated by reference. Determinations shall be made by the Health Officer and / or OWTS Administrator as appropriate and are appealable according to §8:12.

SECTION 13.12.080 – ENFORCEMENT

Subsection A – Public Nuisance Declared

A poorly functioning or failed OWTS, as defined in Appendix A is hereby declared a public nuisance and subject to Trinidad's Nuisance Abatement Ordinance (Municipal Code Chapter 8.12). In addition, an OWTS being operated or used without the proper operating permit or in conflict with the conditions or limitations of the operating permit, or being constructed, altered or repaired without the appropriate sewage disposal permit is hereby declared a public nuisance.

Subsection B – Investigative Powers

In addition to the investigative powers provided in the City's Nuisance Abatement Ordinance, the following shall apply for OWTS related nuisances. The Health Officer and / or Building Inspector may, upon reasonable cause to believe that a violation of any provision of this Chapter or a threat to the public health or environment may exist, investigate to determine whether such a violation or threat does in fact exist. Representatives of the City or Health Officer, after providing at least a seven day notice and upon exhibiting proper credentials and identification, shall be permitted to enter private property during normal business hours to inspect, investigate and take samples related to the performance of the OWTS as required by the provisions of this ordinance. If the inspection requires the entry into a building or an area that is designed for privacy, then prior permission shall be obtained from the owner or occupant. If

necessary under the circumstances, an inspection warrant may be obtained pursuant to Title 13 of Part 3 of the Code of Civil Procedure to obtain right of entry for such purposes.

Subsection C – Violations

In the event of a violation of the provisions of this Chapter, the conditions of any permit issued under this Chapter, or any requirements specified in a Notice of Nonstandard System, the Health Officer, OWTS Administrator or other City Official may commence nuisance abatement proceedings according to the City's Nuisance Abatement Ordinance (Chapter 8.12 of the Municipal Code) and / or State Law in addition to remedies provided for within this Chapter. If the violation constitutes an immediate threat to human safety or environmental welfare, then Summary Abatement may be utilized.

Subsection D – System Failure

If an inspection and / or pumping record or other information reveals a poorly functioning or failing OWTS, the Health Officer, OWTS Administrator and / or Building Inspector shall immediately commence nuisance abatement procedures. Failed systems constitute an immediate threat to public health and safety, and summary abatement may be appropriate. In addition to the procedures provided in the City's Nuisance Abatement Ordinance, abatement of failing systems shall include short-term mitigation and permanent corrective measures. At a minimum, short-term mitigation shall include immediate pumping as outlined in §8:06, reduction of effluent flows (§8:05) and the posting of any areas subject to the surfacing of inadequately treated sewage effluent. Permits for repairs of failing systems may be expedited by the Health Officer or OWTS Administrator by waiving some of the permit requirements or making some retroactive.

Subsection E – Order to Reduce or Discontinue Use

Whenever any parcel or building regulated by this code is being used contrary to the provisions of this code or discharge of waste emanates there from in violation of this code, the Health Officer and / or OWTS Administrator may order such use or discharge discontinued or reduced, and / or the parcel or building or portion thereof vacated by serving a written notice on the property or any person causing such use to be continued. The Health Officer shall notify the property owner / permittee to suspend immediately use of the sewage disposal system, and those uses of the real property which are likely to result in the generation of sewage. Such person shall discontinue the use and / or vacate the parcel or building or portion thereof within the time prescribed within the notice.

Subsection F – Immediate Need to Pump

If an inspection, or other information reveals that an OWTS needs immediate pumping, the Health Officer and / or OWTS Administrator attempt to notify the property owner or occupant immediately in person or by phone, and shall send the owner, or owner's agent a written notice to have the tank immediately pumped. The owner, or owner's agent, five (5) days from the date of first notification to pump the system and to present evidence of such pumping to the Health Officer in the form of a receipt from a qualified service provider. If proof of system pumping required under this section is not received by the City within a timely manner the Health Officer or OWTS Administrator will contract with a private hauler to pump the OWTS and the owner will be billed by the City according to the Summary Abatement procedures of the City's Nuisance Abatement Ordinance (§8.12.060 of the City's Municipal Code). The bill will include the actual cost of pumping as well as associated administrative costs. The owner will be notified in writing of the intended date and time of such pumping.

Subsection G – Stop Work Orders

Whenever any maintenance, repair, replacement, or any construction work is being done contrary to the provisions of this code or other pertinent laws or ordinances implemented through the enforcement of this code, the Health Officer, OWTS Administrator and / or Building Inspector may order the work stopped by notice in writing, posted on the property or served on any such person engaged in doing or causing such

work to be done, and any such persons shall forthwith stop such work until authorized by the Health Officer and / or OWTS Administrator to proceed with the work.

Subsection H – Construction/ Repair Permit Revocation/Suspension

1. Any OWTS construction/repair permit may be revoked or suspended by the Health Officer and / or OWTS Administrator if it is determined that a violation of this ordinance or the Trinidad Sewage Disposal Regulations exists or that the permit was obtained by fraud, misrepresentation or material omission. Prior to revoking or suspending the permit, the Health Officer and / or OWTS Administrator must cause written notice shall be given, according to §8.12.080 of the City's Nuisance Abatement Ordinance, to the permittee and to the occupant of the property. The notice shall specify the violation(s) and the work to be done to correct the violation(s) and shall allow thirty days to complete the work. The notice shall also inform the permittee that he/she has the right to an informal hearing before the Health Officer and / or OWTS Administrator.
2. The notice of revocation or suspension shall inform the permittee of his right to a hearing before the City Council if the permittee files an appeal with the City Council pursuant to section 8:12.
3. The suspension or revocation of any permit shall not be effective until ten days after notice thereof in writing is mailed to the permittee.

Subsection I – Operating Permit Revocation

When it has been determined that an OWTS for which an operating permit has been issued is being operated in violation of this code or conditions of the operating permit, operating in a manner not consistent with its design (such as frequently exceeding the design average or maximum daily flow rate), or is discharging wastewater in a manner which is, or may result in, the contamination of surface water, ground water, or the contiguous seashores of the City, or which contains components that do not conform to this code, or to which access for inspection has been denied, the operating permit may be revoked upon written notice to the owner. If the owner, upon receipt of said notice revoking the operating permit does not appeal as provided in Section 8:12 herein below, or upon appeal the City Council determines that the revocation shall be upheld, and enforcement actions, including nuisance abatement shall be immediately commenced.

Subsection J – Appeal Process

1. Any person affected by an approval, denial, suspension, or revocation of a construction/repair or operating permit (other than a stop work or failure determination, etc. as provided in §8.05 – §8.07) by the Health Officer and / or OWTS Administrator may appeal to the City Council by filing a notice of appeal with the clerk of the City within ten working days of the action of the Health Officer and / or OWTS Administrator. The notice of appeal shall be accompanied by a filing fee set by resolution of the City Council of the City on an amount sufficient to cover costs. The appeal shall stay the effect of the action of the Health Officer and / or OWTS Administrator.
2. The appeal shall be in writing and addressed to the City Council. The applicant shall file the appeal with the City Clerk and shall provide additional copies of the appeal for the Health Officer and / or OWTS Administrator on the day of filing with the clerk of the City. The City Clerk shall forward copies of the appeal to the City Council, Health Officer and / or OWTS Administrator. In the notice of appeal the appellant shall state in full the facts and circumstances which make the action of the Health Officer and / or OWTS Administrator unreasonable. It shall also state the date of the claimed unreasonable action of the Health Officer and / or OWTS Administrator.
3. The City Council shall cause the matter to be set for hearing not earlier than twenty days after the appeal has been filed with the clerk of the City. The Clerk of the City shall cause notice to be mailed to all affected persons (within 300 feet of the property boundaries) at least ten days prior to the hearing.
4. a. At the time and place set for the hearing, the City Council shall proceed to hear the testimony of the Health Officer and / or OWTS Administrator, the testimony of the owner or his representatives, and the testimony of other competent persons concerning condition upon which the action of the Health Officer and / or OWTS Administrator is based and other matters which

the City Council may deem pertinent. Any person affected may be present at such hearing, may be represented by council, may present testimony, and other witnesses. The hearing may be continued from time to time.

b. The Health Officer and / or OWTS Administrator may be represented by counsel. At the request of the Health Officer and / or OWTS Administrator, the City Attorney shall represent the Health Officer and / or OWTS Administrator.

5. The City Council may upon the appeal either affirm the action of the Health Officer and / or OWTS Administrator or modify the Health Officer's / OWTS Administrator's action in whole or in part. The decision of the City Council upon on appeal shall be based upon the facts presented to it.

Subsection K – Severability

If any provision of this ordinance or any rule or determination made hereunder, or application hereof to any person, agency or circumstances is held invalid by a court of competent jurisdiction, the remainder of this ordinance and its application to any person, agency or circumstance shall not be affected thereby. The invalidity of any section or sections of this ordinance shall not affect the validity of the remainder of this ordinance.

PASSED AND ADOPTED by the City Council of the City of Trinidad, State of California, on **Wednesday, December 10, 2008**, by the following vote:

AYES:	Bhardwaj, Ratzlaff, Binnie, Fulkerson
NOES:	None
ABSTAIN:	Morgan
ABSENT:	None

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AMENDED by the City Council of the City of Trinidad, State of California, on Wednesday, **February 10, 2010**, by the following vote:

First Reading of Amendment: Wednesday, February 10, 2010

Second Reading of Amendment: Wednesday, March 24, 2010

Attest:

_____
Gabriel Adams
Trinidad City Clerk

_____
Stan Binnie
Mayor